



Futures and Remakings of Policy-oriented Technology Assessment

Case Studies from Wallonia, Portugal and the Czech Republic

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En vue de l'obtention du titre de Docteur en sciences politiques et sociales

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Acknowledgements

Although this thesis hopefully leads to a major personal achievement, I would like to insist at this point how much of a collective effort this endeavor was throughout these last six years. I will take the freedom to address my thanks in different languages.

Tout d'abord j'aimerais adresser mes remerciements à mon duo de promoteur et co-promoteur. En effet Pierre Delvenne et Sébastien Brunet sont aussi les deux premières personnes que j'ai rencontrées au centre de recherche SPIRAL en 2010. Je suis donc particulièrement reconnaissant à Sébastien Brunet pour m'avoir invité à un entretien d'embauche au SPIRAL. Ayant rejoint l'IWEPS avant que je ne commence mon contrat, il a dès lors assumé son rôle de promoteur consciencieux au départ de son QG à Namur. Je le remercie pour les premiers séminaires doctorants qu'il a organisé en compagnie de Kim et François notamment. Nos rencontres furent moins fréquentes mais pour cela intellectuellement très intenses et stimulantes. Je le remercie également pour ses relectures minutieuses, le temps qu'il a pris pour se consacrer exclusivement à ma thèse et surtout les montées en généralité lors des comités de thèse qui éclairaient la pertinence de mon travail empirique dans une perspective plus large de la conception de l'Etat et de l'évolution de nos démocraties.

S'il y a une personne incontournable dans ce processus d'écriture de thèse au jour le jour, c'est bien Pierre Delvenne. Tant au niveau de mon « terrain » PACITA qu'au niveau de sa cogestion du SPIRAL et du pôle STS, il m'a accompagné et fait grandir dans le monde du TA et de la recherche en sciences politiques et sociales. C'était toujours dans le plaisir et avec passion que nous avons échangé, débattu, observé dans une atmosphère qui faisait souvent s'éclipser le caractère laborieux de la thèse et de nos autres projets de recherches conjoints. Je me souviendrai encore longtemps de toutes les anecdotes qu'on a vécues ensemble lors de nos péripéties à travers l'Europe. Mais je dois avant tout souligner son dévouement, sa patience, sa disponibilité, son côté pédagogique et encourageant, son érudition, son sérieux et son souci pour le détail et les formulations justes dans l'accompagnement tout au long de ces 6 ans de cette thèse. Je lui suis autant plus reconnaissant que j'ai l'honneur d'être son premier doctorant.

Ensuite, j'aimerais m'adresser aux autres membres de mon comité de thèse. Les réunions de comité étaient des moments riches, encourageants et incontournables pour avancer et terminer cette thèse. Je remercie Claire Lobet-Maris pour son apport Namurois et son bagage considérable concernant le TA en Wallonie. J'ai très apprécié ses nombreuses manifestations d'encouragement et sa capacité de reconnaître très tôt le potentiel de mes réflexions. Son attention aux normativités et aux questions politiques véhiculées dans les projets de TA m'a véritablement aidé dans le processus de décentration et d'écriture scientifique. Je la remercie également en tant que récente directrice de mon actuel deuxième domicile scientifique, l'UTS à Namur.

Enfin, Michiel Van Oudheusden est à remercier pour sa disponibilité, sa rapidité de réponse et ses relectures méticuleuses. Navigant entre enthousiasme et sa question fétiche « so what ? », lui aussi avait un don particulier pour reconnaître le potentiel de mes réflexions et m'aider à les formaliser et aller plus loin. J'apprécie particulièrement sa guidance en terme de références bibliographiques et son souci pour les aspects méthodologies.

Je suis aussi particulièrement reconnaissant à Michael Nentwich et Tiago Santos Pereira d'avoir accepté de faire partie de mon jury de thèse. C'est un honneur que nos chemins se croisent pour cet événement important pour moi. Je voudrais souligner l'hospitalité de Michael Nentwich

lors de ma brève visite à l'ITA en 2014 et en tant que Président à l'occasion de la conférence EPTA à Vienne en 2016. Il en va de même pour Tiago Santos Pereira et l'excellent accueil qu'il m'a réservé au CES lors de mon séjour au Portugal.

Je me dois aussi de remercier les différents membres du meilleur centre de recherche du monde : le SPIRAL. Tout d'abord merci à sa directrice Catherine Fallon pour la disponibilité à la demande et les nombreux coups de pouces lors de certains blocages ou autres difficultés d'écriture, de planning ou de timing. Merci aussi d'avoir aménagé l'espace nécessaire pour finaliser cette thèse et le slogan qui m'a accompagné ces derniers mois « une bonne thèse est une thèse terminée ! »

Un énorme merci aussi à tous les membres et associés du SPIRAL, actuels et anciens, jeunes et moins jeunes, en ordre totalement arbitraire: Nicolas, Céline, François, Frédéric, Aline, Kim, Nathan, Jérémy, Maxime, Hadrien, Martin, Justine, Fanny, Damien, Isalyne, Damien, Perrine, Mélanie, Catherine Z., Pierre O., François M., Géraldine, Grégory, Aurore, Stéphane, Stéphanie, Lara. Merci à vous tous pour l'ambiance unique et inégalée aux bureaux du SPIRAL et lorsqu'on est en déplacement. J'apprécie énormément vos encouragements, votre intérêt, votre bienveillance et vos questions, remarques et commentaires constructifs ainsi que vos coups de pouce spontanés dans de nombreux contextes professionnels et moins formels.

J'aimerais particulièrement soulever les récents moments agréables et stimulants passés avec Mélanie et Perrine sur le projet INSOLL ; les réunions en soirée avec Maxime en vue de la conférence des 20 ans du SPIRAL ; l'expérience du partage du bureau d'écriture dans la cave du B31 avec Jérémy puis Nathan ainsi que nos retraites à Lavaux ou Ostende et nos nombreuses discussions autour de cette étrange période où on a « presque fini ».

Enfin je remercie aussi Nadia, Patricia, Frédéric W. et Jonathan dont la gentillesse, la disponibilité et l'efficacité font parfois oublier leur caractère véritablement incontournable pour la recherche au B31.

Merci aussi à ma nouvelle équipe de recherche, l'UTS et le CRIDS à Namur.

Now I need to switch to English, as I would also like to express my gratitude to all the inspiring and sympatric people I met during the PACITA project. Besides the excellent collaboration, I am happy that some of you actually became friends to me. Thanks also to all the people I interviewed for this research, not only in my case studies but also in Brazil and Japan. For giving me their time and sharing their precious knowledge and views for the performance of this research. Special thanks go to the IRIS team lead by Julia Guivant (Marilia, Manuela, Maria-Olandina, Denise, Naira, Ricardo and many others). For our research stay in Florianopolis I also want to thank Luisa for her counseling and friendship as well as Rodrigo, Isabel, Federico, Luini, Carol, Tantiana. Muito Obrigado aos todos. Foi um prazer de conhecer vocês e passar tão bom tempo.

To stay in the lusophone countries, I would also like to thank the many people I met in Portugal. Special thanks to Antonio Moniz for hosting my research stay and to his team of professors and PhD students at the PDAT/GrEAT, especially Nuno B., Maria João, Nuno F.. Special thanks also to Mara Almeida for the many formal and informal meetings we had and the precious help with my research. Also thanks to my flat mates Herdem and David. Thanks to the CES team, especially Tiago Santos Pereira for inviting me for a presentation and arranging for some interviews at CES. Also many thanks to Paulo Fonseca for hosting me, and the many times our paths have crossed without actually meeting in person. Muito Obrigado também aos todos!

Also thanks to the incredibly helpful and welcoming people in the Technology Center of the Czech Republic. Most of all Lenka for wonderfully organizing everything and the many exchanges and debates, formal and informal we had. Additional thanks for engaging in the bilateral exchange and visiting us in Liège. Additional thanks to Michal, Tomas, Ondrej V. and the rest of the team.

I'm additionally grateful to the many people I met for much shorter periods but nonetheless contributed to this collective effort and hopefully recognize themselves when I write in "we". Special thanks to Go Yoshizawa for inviting me to Japan and organizing my short but intense trip, interviews and workshops there. Thanks also to Andy Stirling for the feedback he provided to my analysis during an improvised seminar in Liège. Finally, thanks to all the interviewees, thanks to all the commenters during presentations, conferences, and paper reviews.

Auf Deutsch, möchte ich mich bei meiner Familie und Freunden bedanken. Danke Mama, Papa, Micha & Anna, Oma, Tantchen & Onkels, Kusinen & Co. und natürlich auch die Schwiegerfamilie, die zu Groß zum Aufzählen ist. Danke auch an die Sergej Ferliç Clique im weitesten Sinne, die Parahikers, ex-Sunset, Neville, meine Mitbiker, der Süderhof, Tango Eupen, und wen ich sonst wegen der Scheuklappen in dieser intensiven Schreibphase leider vergessen habe. Ohne eure Unterstützung wäre ich niemals so weit gekommen. Vielen Dank für alles was Ihr mir auf den Weg gegeben habt und dafür, dass Ihr mir zeigt was sonst noch im Leben zählt. Danke für's Mitfiebern, das Interesse an meiner Arbeit und das Verständnis wenn ich mal nicht dabei sein konnte.

En dernier mot en français pour remercier aussi Noémie et Jonathan avec Jules ainsi que mes colloques et/ou potes de socio Namur et UCL et particulièrement Julien, Antoinette, Etienne, Anais, Gwen, Chomin dont les échanges et débats me reviennent et m'inspirent encore aujourd'hui.

Vier Sprachen sind noch nicht genug um mich bei der wichtigsten Person zu bedanken. Danke meine liebe Valeska für deine unglaubliche Unterstützung in allen Lebenslagen. Danke, dass Du mir den Rücken so oft freigehalten hast, dass Du mich ertragen hast, dass Du mich verstanden hast, dass Du mich aufgemuntert, ermutigt, abgelenkt und so oft auch auf das Wesentliche aufmerksam gemacht hast. Danke für das was Du in mir erkannt und entfaltet hast. Wir sind ein super Team und jetzt haben wir es geschafft. Ich freue mich auf die nächsten Abendteuer, kleinen (!) und großen Herausforderungen mit Dir!

INTRODUCTION - Technology Assessment between old and new

This thesis is about the ways the practice and organization of Technology Assessment (TA) currently evolves, moves to new countries and inevitably transforms in the process; a twofold process that we label “remaking”.

In a nutshell, Technology Assessment consists of a combination of different degrees of two traditions of practice: firstly, a policy analysis one and secondly, a public deliberation one (Hennen 2013). Further it presents itself as both a scientific and democratic practice (Van Est & Brom 2012) as it tries to identify and anticipate the implications of technological developments and large projects and aims to feed those insights into decision-making with the objective to act upon those developments in order to mitigate negative effects and maximize benefits (Rip 1986). The concept originated around the 1960’s and was firstly institutionalized in the United States (US) with the Congressional Office of Technology Assessment (OTA) in 1972. OTA provided Members of Congress with information on complex scientific and technological developments and their interplay with society and policy-making. Throughout the 1980’s until the 2000’s, several European countries also adopted the concept and created similar institutions. This uptake came along with significant changes in the practice and its institutionalization. Today, Technology Assessment is defined as *“a scientific, interactive and communicative process, which aims to contribute to the formation of public and political opinion on societal aspects of science and technology”* (Bütschi et al. 2004: 14). Different organization models co-exist, not only at the exclusive service of Parliament but also Government and other public decision-making bodies, thus rendering the appellation “policy-oriented Technology Assessment” (Klüver et al. 2016) a more accurate and encompassing depiction of the current TA landscape in its diversity.

In the framework of this thesis, we had the opportunity to concretely research the remakings of TA in a particularly interesting and challenging context. We took part in a four-year, EU-funded project named Parliaments and Civil Society in Technology Assessment (PACITA), which aimed at further “expanding the TA landscape” in its current state by bringing the practice of TA to other European countries and fostering increased collaborations in the field. We have taken this occasion as an entry point into the issue of remaking of TA by exploring some of the project’s enactments and by further investigating the developments in three regions/countries that were involved in this same project.

1. Anecdotes to start with

Firstly, to introduce this thesis we want to draw on a striking anecdote as well as a particular contrasting quote that are both representative of an important part of this PhD research, how it came to be, and how it presents original insights into the current remakings of policy-oriented Technology Assessment, including all its tensions and ambiguities.

The first anecdote (picture 1) represents the idea of the “good old TA” (Moniz & Böhle 2015). It reminds the reader that the practice we are investigating already has a history of almost half a century. This reference to the past and continuation along existing models, taxonomies and rationales is captured via the **reproductive aspect of remaking**. In other words, it is concerned with “doing more of the same” (Schneider & Lösch 2015).

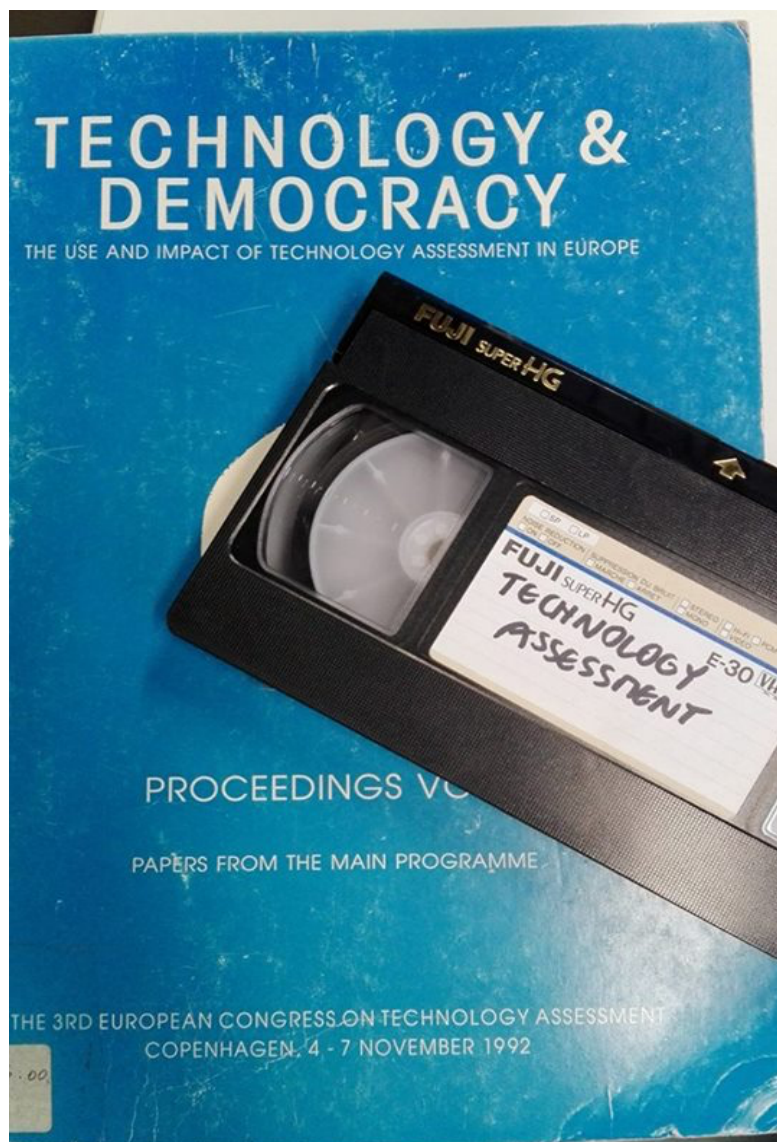


Figure 1: "good old TA"

The second understanding of remaking stands for a transformation, evolution and diversification. Much of the current transformation is actually captured in the quote below (table 1), not only because the “reformist” authors distance themselves from previous forms of TA but also because they introduce rationales and elements that are radically new or were previously foreign to it. It was formulated by one of the co-authors and director of the Lithuanian Knowledge-Economy Forum towards the end of the above-mentioned PACITA project. This tension, at the heart of the polysemy of remaking, will accompany us all along the present thesis.

“Compared to the ‘first wave’ of TA institutionalization in Western Europe, the Forum’s origins as an interest organization might have been thought to preclude adoption of the traditional role of a TA organization, where ‘neutrality’ has been seen as a central virtue. But from a reformist perspective, it makes sense in the Lithuanian context to promote greater institutional and political attention around societal issues related to STI. Authors on national systems of innovation have long stressed the need to build trust through cross-institutional dialogue. And social and environmental issues become increasingly important dimensions of international product competition. The Forum has thus come to see its role as promoting in a more complex manner the interests of its constituents through the development of dialogical forms of policy formation that take into account environmental and social issues related to the innovation-driven economy. In promoting this new focus, the Forum has developed a ‘network model’ for TA” (Hebakova et al. 2016:60).

Table 1: A "reformist" view on Technology Assessment

The photo (picture 1) was sent to me by a friend and colleague who works in a research center in another Belgian city. He and his colleagues had been cleaning their office and were getting rid of all sorts of documentations that had accumulated over the last few decades in the research center’s library. It was probably nothing more than a friendly wink regarding my PhD research topic. However, when I asked if I could have a look at the document and VHS, he answered that it had been thrown away along with other, probably judged obsolete, documentations.

Can it get any more dramatic as this example when it comes to illustrating how TA may have gone out of fashion nowadays? This episode echoed a series of similar feelings at different stages of my thesis, in my fieldwork or during presentations at conferences. It

seems that for many scholars TA has become outdated. Some interviewees from my fieldwork were already retired and younger generations seemed to have lost interest in TA, especially in our field of research: science and technology studies (STS). STS indeed had a strong influence on TA developments throughout its history and in turn TA provided a privileged research avenue for many STS scholars to study the interplay of technology and democracy. However, the interdisciplinary field has taken several “turns” (see for instance van Heur et al. 2012 regarding the ontological turn) and diversified. This can give the (misleading) impression that STS has progressively disinvested the field of TA compared to the power of attraction it had on STS scholars in the 1980s and 1990s (Rip 1986, Smits & Leyten 1988, Schot & Rip 1997, Van Eindhoven 1997, Bimber & Guston 1997, Hennen 1999).

What I consider both a friendly and slightly sarcastic gesture was, on the one hand, a reminder as to how old the TA concept actually is, and how technology has changed since the installation of the first TA organizations in Europe in the 1980s (the VHS as almost obsolete technology is a particularly striking example in that regard). On the other hand, it also reminds us how we are still asking the same questions we asked 30 years ago. The title “technology and democracy” of the 3rd European TA conference proceedings in 1992 is a research issue that is still regularly found in STS and social science conferences more broadly. **In the present thesis I will challenge the idea that TA is old fashioned and make the case for a renewed scholarly interest in studying TA and its current transformations.**

In the existing literature, TA has mainly been studied from the (retrospective) perspective of existing organizations (Vig & Paschen 2000, Delvenne 2011). A series of taxonomies have been established for current (Hennen & Ladikas 2005; Enzing et al. 2011) and even emerging TA institutions (Hennen & Nierling 2014). However, this literature and the retrospective analysis it provides are of limited use when addressing the future of TA and how it may possibly unfold in new polities. More recently, Ganzevles et al. (2014) proposed a new way of analyzing and categorizing parliamentary TA (PTA) organization that opens up to more variety and even possible future forms of TA.

Another limitation of existing literature about PTA organizations is that it mainly reflects so-called “winner stories”. Only the success cases of institutionalizations find their places in the papers of reference of the field. Little mention is made of failed attempts at institutionalization. There is also relatively little scholarly attention to the de-institutionalization of PTA organizations, which started long ago. The closure of American OTA in 1995 has been covered by a few scholarly productions (Kunkle 1995, Bimber 1996, Bimber & Guston 1997, Herdman & Jensen 1997) but in Europe the closures in 2012 of both Institute for Society and Technology (IST) in Flanders and DBT

in Denmark were largely left uncommented, with a few exceptions (Roskamp 2012, Horst 2014, Rabesandratana 2013 in Hennen & Nierling 2015, Van Oudheusden et al. 2015, Delvenne et al. 2015). **These two elements incite us to make a yet missing contribution by studying the current efforts and attempts of institutionalization rather than extensively covering existing institutions. Subsequently, we will document the institutionalization “in the making” and not just retrospectively.** Furthermore, such an approach is a more symmetrical way to conduct our case studies as it equally treats all processes with due attention to their inherent uncertainty, regardless of their successful outcomes or not.

The second anecdotal element (the quote of “reformist authors”) is symptomatic for a series of current changes in the field of TA. The authors not only illustrate in contrast what “good old TA” (Böhle & Moniz 2015) may have been, they also posit themselves in favor of a renewal of TA, which inevitably raises a series of methodological, theoretical and normative questions that are intertwined in the development and evolution of TA. **Let’s take this tension between the old and the new, the continuation and the transformation as a starting point to introduce our thesis and our object of study: the futures and remakings of policy-oriented Technology Assessment.** Throughout this thesis, we will try to demonstrate that the title of the conference proceedings of the 3rd European Conference on Technology Assessment in 1992, “Technology and Democracy”, has lost none of its relevance.

2. Remaking TA

We started this PhD research a month after the 2011 accident at the nuclear power plant of Fukushima Daiichi in Japan. Historically, the uncertainties, risks and social climate around nuclear power were one of the main drivers to install the first Technology Assessment organizations in many countries like the US, Germany, France and the United Kingdom (UK) in the 1970s and 1980s. Today, many other TA organizations coexist in Europe and their current focus includes social, political and economic issues related to biotechnology, ICT, nanotechnology, energy, mobility etc. Ironically, it was such an “old” and well entrenched technology as nuclear power that triggered new reflections on the interplay between nuclear technology, society and political decision-making and kicked off a renewed discussion of equipping Japan with a TA capacity (Böhle & Okuwada 2016, Taniguchi 2016). It demonstrates that both an “old” technology and its assessment may suddenly come back into the center of political, social and media agendas. Suddenly, there is a renewed demand for investigations into the implications of such technologies, with issues such as risk, responsibility, control, ethics and social desirability. Many of those questions were and continue to be addressed by Technology

Assessment organizations today and can become reasons to “remake” Technology Assessment.

Beyond the heterogeneity of coexisting organizational TA models, there is additionally a diversity of discourses, reasons and rationales invoking TA. This was not without tensions, incompatibilities and paradoxes between different, competing approaches. For instance, to name but a few, TA has been related to the desire to prevent catastrophes (such as Fukushima) and perform other early warning mechanisms (Van Eijndhoven 1997) about environmental, health and safety concerns (Fautz et al. 2015) and other risks of new technologies (Porter 1995). From another perspective, TA has also been associated with the idea of avoiding trial and error learning and the social and economic costs associated with it (Schot & Rip 1996). In the same vein, one can also mention TA with the idea of rationalization of STI policy and the search for the best resource allocation in that regard (Hennen & Nierling 2014). From another angle, TA should prevent costly technological lock-ins and inadequate path-dependencies (Schot & Rip 1996). Then, science and technology are increasingly invested with promises of competitive advances in a globalized capitalism and geopolitical strategies. More recently, it appears that TA plays in the hands of the knowledge-based economy (van Oudheusden et al. 2015, Delvenne et al. 2015). TA has also been invested with missions of mitigating (and avoiding) social unrest, thus acting upon the trust and legitimacy of science and technology policies (Bellucci et al. 2002). Today we also witness a desire for TA to orient and guide technological developments and design in socially desirable directions (Nielsen, & Klüver 2016, Grunwald 2014), take up on unmet societal needs and solve a series of deep societal crises (climate deregulation, energy crisis, migratory crisis, economic crisis, growing relative poverty and intergenerational issues just to name a few). Doing so, it should contribute to meet global goals and future deadlines international organizations have set (Klüver et al. 2016). One can for instance mention the “Grand Challenges”¹ (climate change, energy security, ageing, food and feedstock supplies, global pandemics, health inequality and sustainability) for the European Union (Lund Declaration 2009) or the regular United Nations Climate Change Conferences (COPs). In a nutshell, it seems that TA is invested with manifold missions, as it is expected to deal with all of those sometimes incompatible or conflicting demands, evolutions and pressures. But which expectations and demands are currently impacting the most on TA developments? What shifts can we observe over time and how do they relate to the geographical, socio-economic and cultural backgrounds TA takes roots in? Moreover, how do such discourses and rationales affect and remake its practice and institutionalization? Here are some guiding research questions that will accompany the

¹ See for instance the title of two recent TA conferences: “*Mastering 'Grand Challenges' – what can be the contribution of technology assessment?*” 7th NTA conference in Bonn, 16th–18th Nov 2016 and “*New technologies and societal challenges: Bridging the worlds of science, society & policy making*” 3rd European Technology Assessment Conference in Cork, 17th-19th May 2017.

reader in the remainder of this PhD thesis.

3. Thesis structure and methodology

In the first chapter of this thesis, entitled “Taxonomies, Institutionalization and Evolution of TA”, we provide a working definition of how we view the process of institutionalization and how we intend to analyze it. It takes onboard the latest categorization of TA and adopts the approach of “inclusive modeling” (Ganzevles et al. 2014). This approach offers to date the most sophisticated way of categorizing different models of TA with regard to its institutionalization, organizational arrangements and the way projects are carried out. With an eye on future developments, it also explicitly foresees new theoretical categories that have not been empirically met yet. Besides the organizational aspects mentioned above, we also consider cognitive aspects of institutionalization. These include aspects of community building and the various discourses TA is invested with.

Chapter 1 shows that much of the literature of TA is marked by evolutionary assumptions and qualitative directionality. Indeed, the literature review hints at an evolutionary narrative and further links adaptations of TA rationales with new organizational forms of TA. As hinted in the “reformist quote” we will particularly look into a corpus of literature devoted to networked and project-based TA organizations. Finally, we round up this first chapter with the proposition to analyze two dimensions of directionality separately in order to get a more detailed picture of the envisioned TA futures: a) different understandings of science, technology and knowledge more broadly (the knowledge axis); b) different understandings of the political decision-making process (the policy-making axis). We argue that setting them analytically apart helps getting a more detailed picture of the directionality of envisioned TA futures, which will guide us through the analysis of empirical chapters.

Chapter 2 explores how PTA enablers and enactors in Europe share similar assumptions in the preparation of the European FP7 project entitled Parliaments and Civil Society in Technology Assessment (PACITA). We show how the operationalization of this project holds a normative vision of quantitative evolution, namely helping to install more PTA organizations in a wider range of European countries. Furthermore, PACITA turns the above-mentioned literature and its evolutionary assumptions into an action-oriented intervention project. We further describe the normative intervention goals of the project: notably fostering *participatory* TA as a more evolved form of practice and the idea of installing more PTA organizations/capacities in countries described as “lacking” or having a deficit in this regard. Through a series of theoretical and pragmatic alignments, we argue that PACITA furthermore promotes a particular

understanding of TA that mainly crystalized around the idea of a single, national, specialized and dedicated TA organization.

Additionally, we demonstrate in this second chapter the concrete enactments of the project and what lines have moved both conceptually and politically, in terms of promoting TA in new countries and between countries (so-called cross-national TA collaborations). Hence, chapter 2 already indicates the first discrepancies between TA theory and practices. In that sense, PACITA was also an ethnographic case study in its own right - comprising a particular methodology that elicits unique findings. In this thesis, we concentrate mainly on two outcomes of the project: the way in which two particular TA studies were carried out within the overall project and how the normative goal of “expanding the TA landscape” was reformulated and reassessed throughout the end of the project.

Moreover, the chapter constitutes the starting point of our research both from the point of view of operationalizing our research question and establishing a meaningful, adapted methodology. We were ourselves involved in the project for its entire duration and along with our colleagues we represented one of the regions/countries covered by the project and were invested with the above-mentioned normative missions. Given these constraints and the impossibility of a truly exterior position, the situation required an original methodological set up to gather relevant research data. Treating our fieldwork in a more distant manner and with a concern for triangulation (Rothbauer 2008), we found additional heuristic value in dynamic approach of insertion (Robinson 2010) and in explicating a relational “systems of places” (Favret-Saada 1977). The latter showed how the evolutionary and deficitary narrative is not only grounded on theoretical considerations but also plays out in everyday power relations, relative actor positions and even affections.

Then, in **chapters 3 to 5**, we performed three case studies (Yin, 1994) in three different sites: Portugal, the Czech Republic and the Walloon Region in Belgium. Such an approach was particularly suited to our research as *“case studies are a preferred strategy when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on contemporary phenomenon within some real-life context”* (Yin 2002: 1). Those particular three countries/regions were chosen as case studies for a number of reasons presented below.

Firstly, they all had at least one partner organization active in the above-mentioned PACITA project. This entry point constitutes a basic common ground of commensurability between the cases. The timeframe of fieldwork was also relatively similar. Secondly, from what we knew prior to our empirical fieldwork, the partner organizations and their strategies to promote TA varied considerably on several levels.

They were contrasted regarding the type of embarked partners in the European project: the partner organization was a single research center in social and political science in Wallonia, several research actors (research center, informal network) in Portugal, and a former Technology Transfer office of the Academy of Sciences in the Czech Republic. The process of installing TA capacities was also at different degrees of “maturity” and the chosen sites of inquiry were amongst the “most advanced” or “tangible” examples² of TA developments within the PACITA project. Finally, in terms of research logistics, it was also possible to establish proper research agreements with Portugal and the Czech Republic.

Moreover, the countries/regions under scrutiny are somehow considered as (semi-) peripheral or “in transition”. Enzing et al. 2012 suggested that the economic performance (measured in GDP) could possibly have an influence on TA developments. We will not go into complex and quantitative macro-economic comparisons between those countries. However, it is relevant to mention that a series of actors in the respective case studies define their country/region as semi-peripheral or in transition. The concept of (semi-) periphery covers a vague and broad idea of not being in the center (in terms of economic performance, global scientific and innovation leadership – see Gavroglu et al. (2008) for a review of the concept in the specific area of Science and Technology)). The term “transition” (Hennen & Nierling 2014) also covers realities such as industrial and economical reconversion but also a process of democratic transition. All case studies are held in relatively young democracies. Portugal was ruled by a dictatorship until the 1970s. The Czech Republic is a young country that abruptly transitioned from a communist regime to a liberal and capitalist democracy. The process of federalization of Belgium also makes the Walloon Region a young political entity that needed to take responsibility in ever growing policy competencies and is in the process of restructuring its industry and economy, in an effort to “catch up” with Flanders (Van Oudheusden et al. 2013).

The analyses of the case studies present in chapters 3 to 5 adopt a relatively similar structure despite taking into account local specificities and building on diverse sets of research data. Firstly, they address contextual elements of the political and STI systems. Secondly, the actors present in the field of Technology Assessment are mapped and historically situated where relevant. Thirdly, the institutionalization of the practice is addressed and qualified by giving attention to both organizational and cognitive dimensions.

² In Wallonia, TA was the object of a parliamentary resolution and a subsequent decree proposal. In Portugal, there was also a resolution and a process of formal hearings in Parliament, which resulted in several reports with organizational propositions for a TA capacity. In the Czech Republic, TA became a formal line of the work program and a sub-unit in the department of Strategic Studies in the Technology Center.

The methodology that supported those case studies followed primarily an inductive approach by “following the actors” (Latour 2005) into the relevant working sites where TA is currently being remade. Our work is principally qualitative and interpretative. It is based on our “encounters” with the field and encompasses in-country fieldwork, domestic and overseas, interviews and textual-archival research. Subsequently the nature of interviewees, the documentation, the organizational focus and boundaries of our research object were constructed *in situ* with regard to the local peculiarities. Also, despite common structure as a starting point and common references across the case studies, each one of them may reveal significant differences as to how TA develops or is taken up by various actors. In order to situate what we observed in each case study in a broader context of remaking TA, we also relate our observations and questions emerging from our fieldwork to other processes of remaking at play at the level of the TA community. Hence, each case study is also conceived as a standalone production.

Each case study has its very own story to tell. Chapters 3-5 may also to be read autonomously without much preliminary knowledge and in whatever order pleases the reader. As the described developments are still “in-the-making” and therefore highly uncertain, we turned that uncertainty into a resource for the thesis as we took care to relate the many paradoxes, nuances and ambiguities, which surround their developments. It is also a consequence of the symmetry principle (Bijker, Hughes & Pinch, 2012) outlined above. Indeed, as futures of TA are plural and open, it was important for us to reflect the complexity of our fieldwork, including alternative pathways, competing projects, points of bifurcation, legislative back-and-forth, alternative discourses and so forth.

The way concepts are applied and heuristically exploited in each fieldwork was inductive, context-sensitive and plural rather than deductive. In this sense, most concepts (e.g. “inclusive modeling”, “specialization”, “community of practice”) developed throughout the thesis can be seen as “sensitizing concepts” (Blumer 1954, Bowen 2006). They are starting points to guide the researcher in the exploration of her fieldwork rather than hypotheses to be verified and lock up the researcher’s observation. A sensitizing concept *“does not enable the user to move directly to the instance and its relevant content. Instead, it gives the user a general sense of reference and guidance in approaching empirical instances. Whereas definitive concepts provide prescriptions of what to see, sensitizing concepts merely suggest directions along which to look”* (Blumer 1954: 7). Hence this approach was particularly suitable to explore the peculiarities of each fieldwork while simultaneously having a concern for cross-country comparison and speaking to broader evolutions and remakings in the field of TA. Indeed, against what a linear and sequential reading of this thesis may suggest, the theoretical framing and the fieldwork actually constructed themselves in many interactions and iterations going back and forth between the case studies (chapters 2 -5), the theoretical chapter 1

and the discussion (chapter 6).

The fieldwork in Portugal and the Czech Republic was conducted in 2014. Not much has changed since in terms of TA developments. However, as we maintained punctual contacts and exchanges with some of the main TA proponents, we updated our description according to new developments that came to our attention. More generally, as we were progressing in the collection and analysis of our data, we have consistently engaged with the TA community and the local partner organization in our fieldwork and presented our findings in order to validate them and strengthen our analysis. This exchange dynamic was not only a heuristic of our ethnographic approach; it was also a contractual prerequisite to our research stays in Portugal and the Czech Republic.

Let us now briefly go into some of the specifics of the national/regional case studies developed in chapters 3 to 5. In those chapters we further empirically verify and challenge these above stated assumptions of evolution and directionality and describe how TA is currently being remade in a variety of unforeseen ways. **In Wallonia (chapter 3)**, we show how the evolution of TA was always closely intertwined with Belgian federalism and how the more recent project to install “TA capacity” in the Walloon Parliament is deeply entangled with regionalist politics. We also show how, over time, paradigm shifts occurred between different generations of TA and we point at the emergence of a fourth generation. We propose that the discursive existence of a fourth generation of TA may actually hinder the concretization of the former model.

In Portugal (chapter 4) we followed a process in Parliament that attempted to determine which best organizational form TA should take in the country, in the particular context of economic crisis and austerity measures. Two groups of actors with different approaches to TA influence the process, which undergoes a series of shifts throughout time resulting in a flexible understanding and boundary work of TA taxonomies. Here the development is much more incremental without clear breaks or previous phases. We aim to show how, together with the outspoken idea of networked TA, a rather positivist understanding of knowledge for “evidence-based policy-making” jointly emerged with efforts at institutionalizing TA.

In the Czech Republic (chapter 5), until recently, explicit references to TA were relatively rare. We analyze how the practice of TA is taken up and combined in a particular organizational setting, the one of the Czech Technology Center. The practical arrangements within the institutional and organizational settings of this institute contribute to redefine the understanding, rationale and focus of TA. We find that while TA contributes to broadening the understanding of innovation (van Oudheusden et al. 2015), the attention to negative implications of technology is less prominent. Furthermore, we show that the hybridization of the practice of TA with other knowledge

sources for policy-making is the most prominent here and we attend to some possible implications for the broader TA practices and community.

In the **transversal discussion (chapter 6)**, we contrast and aggregate the lessons and findings from each case study related to the normative framework of PACITA as depicted in chapter 2 and to the literature reviewed in chapter 1.

The first part of the discussion builds on a more systematic comparison between the three case studies and the PACITA project. It questions the developments in each country in terms of institutionalization (organizational dimensions including the inclusive modeling, use in policy-making and impacts, cognitive aspects such as discourses and community building) and it situates them with regard to their understandings of the decision-making process and their underlying conceptions of knowledge. It also compares and assesses the different efforts in terms of organizational specification and those rather aimed at developing the practice of TA and its related competences. The issue of specialization or convergence with other practices is also addressed throughout the findings of our fieldworks. The results highlight how the idea of simply creating new single, national, specialized and dedicated TA organizations is challenged in multitude of ways.

The second part of the discussion develops a more inductive or interpretive comparison (Jasanoff et al. 2007). It builds on the uncontrolled variations, original and unforeseen insights stemming from the case studies and produces two main findings. The first finding is that the progression on the governance axis (from centralized, single addressee policy-making to multi-level, multi-actor governance) outweighs the evolution on the knowledge axis (from positivistic and universal science to post-positivistic and encultured knowledge). This remaking, which we labeled “evidence-based governance”, actually contrasts not only with the initial PACITA objective but also with the futures of TA envisioned in literature as being more reflexive and opened up. Both observations require reconsidering the above-mentioned evolutionary narrative for a more complex and paradoxical understanding of the future of TA, which should actually be written in the plural. In an interpretative stance, and in the face of no new organizational creations, we argue that this “evidence-based governance” is coherent with a simultaneous shift away from the institutional deficit of TA (creating new institutions in newcomer countries) to a renewed strategy of resorbing a knowledge deficit (making TA knowledge available to a wider number of countries).

The second finding stresses that in all case studies as well as in the PACITA project, we find high expectations towards scaling up TA at the cross-national level. Along with these visions comes the idea of transportability of TA knowledge across organizations, nations and cultures. This renewed approach to TA collaboration and capacity building

increasingly gains traction both from a bottom-up perspective (where actors try to organize themselves into a critical mass) and from a top-down perspective of neoliberal and austerity policies. In such a constellation, positivist science provides an evidence-base, which supposedly supports multi-level, multi-actor governance as it allows knowledge produced in one place to travel and serve a wide spectrum of actors and decision-making arenas. The consequences of this shift are crucially important to explore the remakings and futures of Technology Assessment, as they put to the fore the issue of subsidiarity of both the production and the use of TA knowledge. Finally, we rely on these findings to raise a series of new theoretical, practical and normative questions for the TA community and scholarship.

Finally, the conclusion, by turning to a cultural political economy analysis, suggests a coherent reading of the networked and project based organizational forms and the identified evidence-based governance constellation that goes beyond the simple diagnosis of paradoxical and diversified evolutions. Further extrapolating on those trends raises a series of old and new questions and challenges to the practice of TA and its core interest in the interplay of technology and democracy.

CHAPTER 1 - Taxonomies, institutionalization and evolution of TA

1. Categorizing Parliamentary Technology Assessment (PTA) in Europe

PTA in Europe presents a complex map composed of different ways of doing Technology Assessment to support decision-making and enhance societal debates on science and technology (S&T) in society issues. European PTA institutions are represented in the European Parliamentary Technology Assessment (EPTA) network³ within which co-exist different organizational models, mission statements, methods and balances between in-house and outsourced TA work.

Taking this diversity of models and approaches into account, much work has already been done to categorize the existing PTA organizations. A common way of accounting for this variety of European PTA refers to two main dimensions: the institutionalization in relation to Parliament; and the mission statement and the methodological approach to TA. Enzing et al. (2012), Hennen & Ladikas (2009), Cruz-Castro and Sanz-Menéndez (2005) distinguish between a Parliamentary Committee model; a Parliamentary Office model; and an independent Institute model (Enzing et al. 2012) or alternatively “interactive model” (Hennen & Ladikas 2009). Those models presently all co-exist within the EPTA network at the European level. Let’s review some of the general traits of those three models. In the committee model, the MPs themselves play an important part in the TA process, which leads Cruz-Castro and Sanz-Menéndez (2005) to label it “political parliamentary office of TA”. In the Parliamentary Office model, experts and scientist are included as in-house staff, which in turn resulted in Cruz-Castro and Sanz-Menéndez’s appellation of “technocratic parliamentary office of TA”. The independent model is more distantly linked to Parliament and sometimes also serves the Government. Its mission statement either comprises the exclusive information provision into political processes or both the information provision with an additional task to stimulate societal debate on S&T. This second mission comes along with the use of participatory, deliberative and communicative methods that additionally involve stakeholders and citizens besides politicians and experts in the process.

³ <http://www.eptanetwork.org/> (accessed 13th of April 2017)

Taking this plurality of missions and methods into consideration, the practice of TA varies from one country to another. Each PTA organization applies its own priorities in order to “*contribute to the formation of public and political opinion on societal aspects of technology*” (Bütschi et al. 2004: 14) – sometimes on a case-to-case basis, dependent on the issue at stake and nature of the project. Institutional forms and mission statements are not unrelated as shown by several researchers (Delvenne 2011, Enzing et al. 2012, Ganzevles et al. 2014).

Even if many scholars provided much-needed taxonomies to characterize existing PTA organizations (for instance, the taxonomy of committee / office / independent models), until recently we lacked information on the relationship towards policy-making. For this reason, Ganzevles et al. (2014) have proposed an “inclusive modeling approach” to compare European PTA, which distinguishes between four spheres and analyses how TA activities tend to develop links (and potentially transform relations) between those spheres. The four scrutinized “spheres” are Parliament, Government, Science and Society⁴ and the levels of analysis include the institutional level (client, funding, evaluation), the organizational level (board or steering committee, working program, staff) and the project level (project team, project participation, advising and reviewing roles). The inclusive modeling approach completes existing classification in literature and reveals five, partially overlapping models (Ganzevles et al. 2014). These include (1) mainly parliamentary involvement in TA (European Parliament, Finland, France); (2) shared Science-Parliament involvement in TA (Catalonia, Germany, United Kingdom); (3) shared Parliament-Science-Society involvement in TA (Denmark as of 2012 and Flanders until 2012); (4) shared Science-Government involvement in TA (Austria⁵); and (5) shared Parliament-Government-Science-Society involvement in TA (Netherlands Norway, Switzerland, USA-Governmental Accountability Office).

Model 1 and 2 can be distinguished notably via the fact that in model 1 the TA work is exclusively done by the MPs themselves (the French “*Office parlementaire d'évaluation des choix scientifiques et technologiques*” [OPECST] is an iconic example here), whereas

⁴ While this approach aims at accounting for the involvement of these different spheres, there is also a complementary move, which is concerned with delimiting TA from these spheres for them not to merge and to stay relatively independent from one another. This double and seemingly paradoxical effort can be captured with the concept of “boundary work” (Gieryn 1999). As Irwin (2008) notes, “*one potential difficulty of the boundary work concept, however, is that (depending on the interpretation) it can be taken to imply that, although ‘science’ and ‘politics’ come together in such examples (or that they are permeable round the ‘edges’), ultimately they are analytically separable and relatively static.*” (Irwin 2008: 588). The same goes for the two other categories of the inclusive modelling approach (government and society). Although general and intuitive concepts, it remains important to be attentive to the ways the boundaries between those spheres are empirically made and remade in the particular case of Technology Assessment institutionalization.

⁵ The Institute for Technology Assessment (ITA) in Austria has since reinforced its links with the Parliament and recently become full EPTA member.

in model 2 the MPs are assisted or even delegate the TA work to scientists or experts. The following models subsequently represent a growing involvement of an increased range of actors in different phases of TA.

The nuances this model brings about will be of interest for fine-grained analysis in later chapters. While some spheres are very broadly defined in this model, they, at times, require additional definition when it comes to the understanding of terms such as « society » or « science ». Indeed, those understandings can significantly vary from one organization to the other and are additionally depending on political, institutional, legal and cultural settings that prevail in the studied countries or regions. However, the shift from a triangular (Figure 2) representation (Science, Parliament, Society) to a four-spheres model (Figure 3) gives additional depth to the understanding of complex situations. As a consequence of the growing role of government in TA, Klüver et al. (2016) have proposed the term of “policy-oriented Technology Assessment” to replace the narrower concept of “Parliamentary Technology Assessment”.

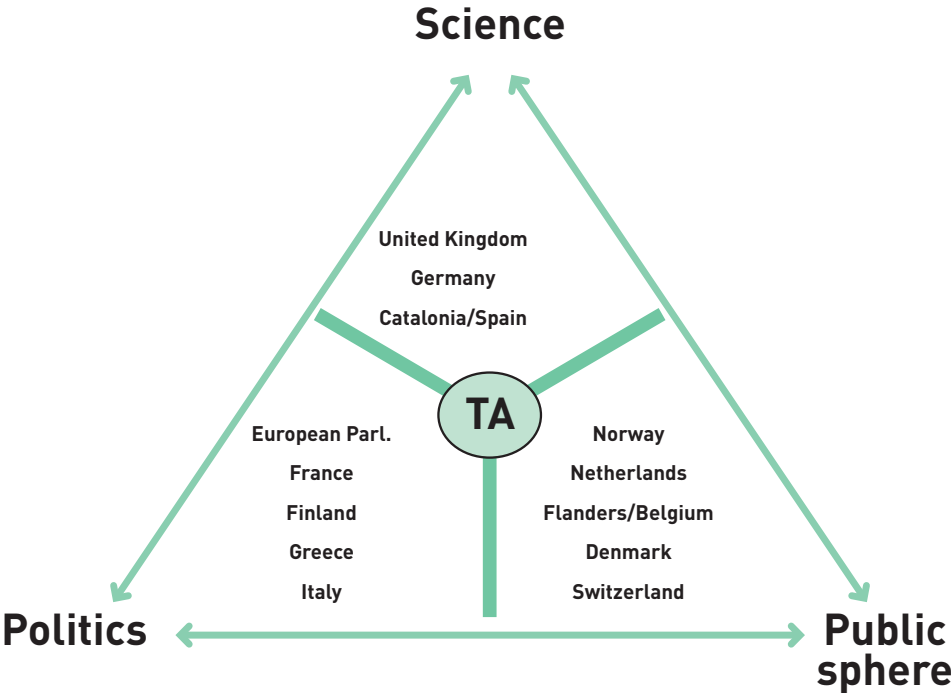
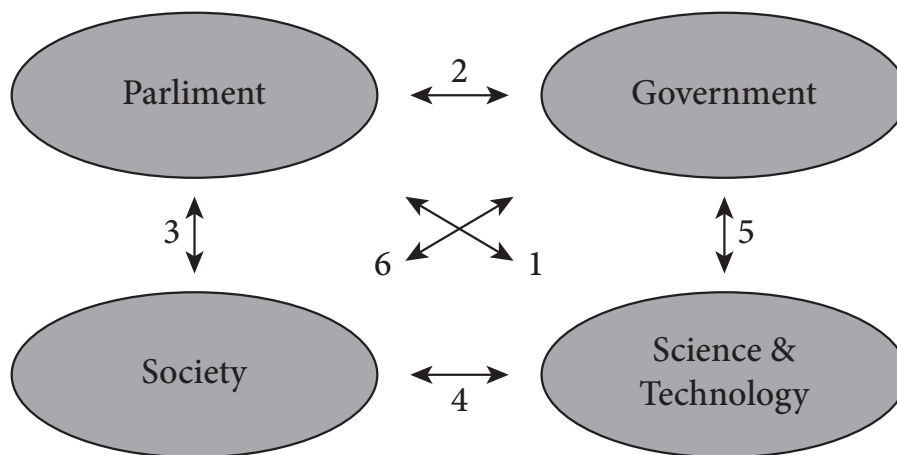


Figure 2: Triangular representation of TA. Source: Hennen & Ladikas (2009)



Four spheres involved in the relation model of PTA

Figure 3: Relational four-spheres inclusive modeling. Source: van Est, Nentwich, Ganzevles et al. (2016)

As one can see in figure 3, the inclusive modeling approach highlights the role and the tentative transformation potential TA can play in the relationship between the different spheres. By addressing the relationship between the different actors within a sphere and between the different spheres, it aims to give more justice to different historical rationales of TA such as, for example:

- Timely informing parliaments on positive or negative impacts of S&T developments based on scientific knowledge (science – parliament interface)
- Acting on the power balance between the executive and legislative branch in favor of the latter (government – parliament interface)
- Playing a constructive role in societal controversies via the stimulation of public debate (science-society interface and/or government-society interface).

But the inclusive modeling also allows unexpected (or non-classical) combinations between those spheres. Furthermore, as PTA institutions historically evolve, the authors argue with the concept of institutional flexibility that their approach also opens up possibilities for shifting roles and adapting to institutional opportunity structures over time.

The differences in PTA practices and organizations throughout European countries do not impede on initiatives aiming to share experience and knowledge across countries: PTA directors and practitioners have long played an important role in the scholarly knowledge production about TA (as attest their co-authorship of the following works for instance: Vig & Paschen 2000, Hennen & Ladikas 2009, Joss & Belluci 2002, Hennen

1999, Guston & Bimber 2000, Bütschi et al. 2004, Ganzevles et al. 2014). A significant part of this literature corpus stems from joint European projects such as EUROPTA (European Participatory Technology Assessment), TAMI (Technology Assessment: Methods and Impacts), and of course PACITA (Parliaments and Civil Society in Technology Assessment), which will be at the center of our attention in chapter 2. Before that, we suggest to continue our account of European TA evolutions.

2. Re-contextualizing of TA and its institutionalization: An evolutionary narrative

Despite the recognition of the value of the diversity of models and approaches, there is a tendency in the specialized literature to identify common evolutionary patterns in TA practices and organizations. This is often linked to insights from social and political science (Cohen, March & Olsen 1972), policy analysis (Hoppe 1999) and science and technology studies⁶ that were contemporary with European TA reflections and arguably influenced TA scholarship (Hennen & Nierling 2015, Lucivero 2016).

Some accounts of those models and typologies comprise a certain idea of evolution⁷. “Opening up TA” and fostering participation is for instance a common trend as stated by (Hennen & Nierling 2014: 2): the *“second wave of TA’ (Rip 2012) [i.e. the moment TA ‘swaps’ over to the European continent] has been connected with a focus by TA on the involvement of stakeholders and the wider public in TA processes”*.

As the mission of stimulating public debate always adds up to the primary mission of information provision to policy-makers, so do the methods and approaches. The latter always builds on the earlier missions and adds additional dimensions to it: *“The methods are stacked up; analysis is always the basis on which actions, aimed at interacting with parties and/or the stimulation of public debate, can be added”* (Ganzevles et al. 2014: 295). The story of TA can thus be read as an evolutionary diversification of methods and approaches. An increasing range of actors is included in the process. TA broadens and complexifies its understanding, rationale and tasks. Such a narrative is notably present in the paper by Ganzevles et al. (2014): the arrows in the Figure 4 reported below indicate the idea of such an evolution. Interaction and communication are added to an

⁶ Referring to concepts such as “Reflexive modernization” (Beck et al. 1994), “Mode 2 knowledge production” (Nowotny et al. 2001), triple-helix (Etzkowitz and Leydesdorff 1995), Post-normal science (Funtowicz & Ravetz 1993) or strategic science (Rip 2000).

⁷ Such an evolutionary reading also comprises a normative dimension as it evaluates practices and organizations with regard to their progress on such an evolution and somehow draws a desirable horizon to be reached. This comes along with an associated deficit discourse about countries and organizations that fail to comply with such evolution. We will come back to this in a later section and the PACITA chapter.

original analysis task on the method axis. Progressively experts, stakeholders and citizens are added to parliamentarians on the involvement axis.

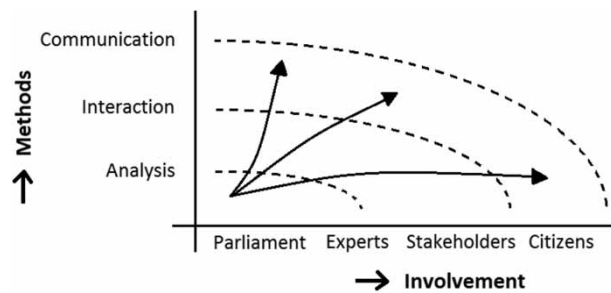


Figure 4: Broadening of methods and Involvement in PTA. Source: Ganzevles et al. 2014

Those “evolutions” are explained and justified by some observations such as (1) organizational and methodological issues, (2) epistemologies of the science-policy interface, (3) cultural and economic shifts in Western European countries.

Firstly, the ideal of participation and more generally the combination of policy analysis and public deliberation approaches were already discussed at the inception of TA in the US (Bimber & Guston 1997). However, concrete organizational settings and country specific contexts tended to favor the policy analysis approach over the other. Progressively, the objective of public debate becomes increasingly acknowledged among most PTA institutions but it remains unequally and unevenly put into practice (Delvenne 2011).

Secondly, Hennen points at the increased acknowledgement of the shortcomings of both the “decisionistic” approach to the relationship between scientific expertise and political decision-making (where science is politically instrumentalized and political decisions are totally sovereign and taken on the basis of interests and values) as well as to the “technocratic” approach (where political issues are rationally dealt with on the basis mainly of techno-scientific facts) (Habermas 1971, quoted in Hennen 2012). The author dismisses both approaches as “*inadequate description of the actual practice of scientific policy consultation but also from a democratic perspective both inappropriate and impracticable*” (Hennen 2012: 29). Instead “*normative claims (values and needs) have to be examined with regard to their generalizability, feasibility, costs, and utility in the light of scientific and technological knowledge. Conversely, scientific and technological knowledge (of means) has to be assessed in the lights of normative and evaluative standpoints*” (Hennen 2012: 29).

Thirdly, both policy analysis and deliberative approaches are reactions to the technocratic and rational styles of policy-making in S&T issues. “*There was a strong (compared to the implicit consensus on S&T in the 1950s and 1960s) and articulated*

critical public interest in S&T issues. Apart from a more generalized criticism of 'industrialization' and 'consumerism', citizens initiatives on every political level (from the local to the national) were demanding to have a say in planning decisions and R&D politics as these were regarded as interfering with the citizens' rights. This was certainly a reason for the relevance of the issue of public participation in TA right from the inception of TA in the USA and even more later on in Europe" (Hennen & Nierling 2014: 3).

These changes manifest a shift from a TA approach delivering *scientific advice* and expert input to a broader understanding of *knowledge* needed to inform decision-making which includes interest, values, expectations and lay perspectives. Furthermore, this shift from scientific expertise or evidence to hybrid forms of knowledge does not only need to be considered as a product to be delivered to "clients". Van Eindhoven (1997) also stresses the process dimensions of those new forms of TA, notably the "social learning" (Rip 1986) they may induce. While the product approach results in scientific and technical reports that are delivered as "one shots" to parliamentarians, the process approach is much more interactive and involves debates integrating different viewpoints, ongoing dialogues and learning processes of actors involved or affected by technological development, management or use. Decker and Ladikas (2004) mapped out a series of impacts that PTA exercises may bring about. They provide a more complex understanding than the mere vision where science informs policy-making. Their impacts' taxonomy suggests that actions such as raising knowledge, forming attitudes/opinions and initializing action fall in the remit of TA activities at the interface of the four spheres identified by Ganzevles et al. (2014).

These induced shifts in the understanding of how TA produces knowledge and to whom also affected the understanding of TA itself. Vig & Paschen (2000) noticed a move from probabilistic and risk-centered early warning TA (also called "watchdog TA" following Smits & Leyten 1991) for policy-makers to a humbler approach trying to identify innovation potential and to ease the social conditions of its realization (social robustness of innovation). In parallel, they also observe a move from a (often critical) technology-oriented (supply-side) analysis to an interdisciplinary and normative engagement with desired futures so to link scientific and technological developments with societal needs and expectations.

All those changes indicate another shift in TA's approach from government to governance. From a nation-state and parliament-centered (even performed) practice to an increased diversity of actors performing Technology Assessment and addressing a wider range of decision-making actors at sub- and supra-state levels. The understanding of the decision-making process also becomes more complex. The classical command and control approach ideally conferred to modern and state-centered public institutions gives way to the concept of "STI governance".

2.1. Institutionalization of TA

The EPTA network currently features 13 full-members, 7 associate members as well as a series of observers. Behind those figures often lie long, complex and heterogeneous institutionalization pathways. In some countries, it sometimes took decades before TA organizations were installed, obtained stable funding and were granted full EPTA membership. But recent history also proved that there is no guarantee that PTA institutions are there to stay forever. In 2012 the Flemish Institute Society and Technology was closed down and the Danish Board of Technology lost its funding from government and its formal link to Parliament, creating a zone of turbulences and uncertainties with regard to its full membership within the EPTA network. With the exception of the dismantling of the US-American Congressional Office of Technology Assessment in 1995 (Kunkle 1995, Bimber 1996, Bimber & Guston 1997, Herdman & Jensen 1997), these closures and uncertainties regarding institutional developments are relatively unreflected in TA literature⁸. The latter tends to retrospectively focus on winner stories, i.e. successful institutionalization and often omits the difficulties and crises the practice encountered throughout its diverse history.

Furthermore, the EPTA network gives a particularly contrasted picture of the reality of TA in Europe. The network gathers a particular type of TA organizations, which have to fulfill several criteria. Besides operating in geographical Europe (as defined by the Council of Europe), full members must be devoted to TA or related activities (including an own budget, secretariat and a competence in S&T issues) and formally serve the parliament⁹. In addition, membership is exclusively granted to a whole country or region, which is generally represented by a single TA organization. This superposition of entire countries or regions with single PTA organizations (simply put: one organization – one country) necessarily provides a narrow account of the European TA landscape. At first, it implies that there would be no TA activities in countries that are not EPTA members. However, Bütschi et al. (2004) also identify a range of consultancy firms, scientific organizations or dialogue platforms as additional organizations active in the field of TA. Since the 1990s a series of additional public and private actors such as universities, think tanks and project-based enterprises have also taken up the TA label and coined specific approaches such as Constructive TA (Schot & Rip 1997), interactive TA (Grin et al. 1997), real-time TA (Guston & Sarewitz 2002). The main difference here is that their relation to Parliament and the policy-making arenas may not be as formalized as for the EPTA members. At second and not unrelated to the previous point, the representation by a single organization blends out other organizational forms of TA

⁸ However, one can mention the editorial in Nature (2011), Horst (2014), Nielsen (2014) regarding the Danish case and Roskamp (2012), Rabesandratana (2013) in Hennen & Nierling (2015), Van Oudheusden et al. (2015), Delvenne et al. (2015) for the Flemish case.

⁹ Countries or organizations that do not fulfill one of these criteria can obtain an associate member status.

and patterns of institutionalization. Hoppe and Grin (2002) for instance mention multiform or pluriform capacities that perform Technology Assessment as opposed to one single TA organization.

Hence, rather than considering institutionalization as a dichotomist property and distinguishing between countries that are equipped with national PTA capacities and “white spots on the TA map” (Hennen & Nierling 2015), we propose to view it as a multifaceted process, which can take various forms. To do so, we choose to describe the process of institutionalization along both organizational and cognitive dimensions (Petit Jean 2016).

At the organizational level, such a comprehensive way of considering institutionalization addresses both the formal affiliation of actors and organizations involved in TA and the relationship a TA capacity pertains with the spheres of science & technology, the government, the parliament and societal organizations at the project, organization and landscape levels (Ganzevles et al. 2014). It renders a view to accommodate possible future forms of institutionalization that do not yet exist (Van Est et al. 2016), thereby allowing a multidimensional representation of TA institutionalization. Therefore, we will contrast with previous narrow and dichotomist approaches of institutionalization as well as more elaborated forms of such evolutionary narrative, which is aimed at measuring a degree of institutionalization or attributing (low or high) scores of institutionalization of a given practice to different countries and regions (e.g. Varone & Jacob 2004). The formal organizational or structural aspects of institutionalization further comprise both broader inter-organizational (funding lines, representatives in the board, mission statement, etc.) and narrower intra-organizational (staff, working procedures, specialized units, etc.) aspects (Petit Jean 2016). Jacob (2005) mentions whether the practice is widespread among different policy areas as further organizational indicators of institutionalization.

At the cognitive level, we are concerned with the presence, intensity and content of TA discourses as well as the existence and qualification of a community of practice. Cognitive dimensions refer to epistemic, theoretical and/or methodological rationales on which the practices and discourses of TA build upon. This will concretely be explored by referring to discourses about TA that policy-makers, addressees or supporters hold as well as their tendencies to refer to TA in a given context. The discourse of TA will mainly be addressed later, on a case-to-case basis because it is heavily dependent on the actors as well as the historical and geographical contexts. Another cognitive element of institutionalization is the way in which the practice makes a community of practice. *“Communities of practices are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly”* (Wenger & Trayner 2015: 1). To look for the development of a community of TA practice in our

cases studies, we will consider various elements such as, for example, the existence of a national society or professional association, the edition of journals, the organization of conferences and other professional meetings, the definition and use of professional standards, as well as a plurality (i.e. different approaches, actors, rationales) or even a (competitive) market for the practice. In the currently existing TA landscape, a concrete and structuring aspect of PTA community building at the international level is the EPTA network. That network is indeed a privileged venue to discuss and initiate European and international collaboration in TA and it may act as an advocacy group for PTA at the European level, both in the member countries and in countries that do not have formalized PTA capacities. Another example is the German-speaking TA community, which is also structured on a cross-national basis with organizational members from Germany, Austria and Switzerland as well as individual participants from other European countries. The NTA (*Netzwerk TA*) assumes several community-building functions such as yearly conferences, thematic working groups, a qualification scheme for PhD students (TRANSDISS, see Dusseldorp et al. 2009, Decker 2015), a newsletter and mailing list, an information portal (Open TA) and a dedicated, bilingual (German – English) journal (*Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis - TATuP*). A third key element to cognitive dimensions of institutionalization of TA is the issue of specialization. By specialization we mean an active effort of naming and defining the practice of TA with regard to elements such as its scope, its disciplinary boundaries, its theoretical and epistemological foundations, the nature and content of the practice, its addressees or its working procedures. It furthermore involves a dedicated effort of differentiation vis-à-vis other practices (or at least establishing the terms of cross-practice exchange or complementarity). Specialization is thus opposed to hybridization, understood as a combination of blending of practices, possibly resulting in indetermination and a lack of differentiation of those practices¹⁰. Pluralism (or competition) is increasingly observed in countries where the TA organizations outsource studies or regularly contract consortia to run TA studies on their behalf on a project-basis for a defined period of time. Nonetheless, competitors are often a relatively small sample of actors. Also here, some competitors do not define themselves exclusively or explicitly to TA. We find organizations active in future studies, STS, foresight, and innovation studies to carry out the contracted work, either on their own or together with “classical” PTA organizations. Of course, there are also obvious organizational dimensions to the issue of specialization: dedicated departments, teams or organizational charts, special funding lines, legal and spatial separations and so on.

¹⁰ Our understanding of specialization, if not otherwise specified, does not concern topical specialization. This is for instance the case when a TA organization focuses on specific issues only (biotechnology, energy or ICT for instance).

2.2. Futures for TA: A literature review

With this more nuanced approach to the process of institutionalization, we will be best equipped to research and account for futures of Technology Assessment in the framework of the PACITA project and in the investigated countries. To start with, there is a considerable corpus of literature devoted to the future of Technology Assessment. Much of it concerns a continuation of TA along the lines of the evolutionary narrative described above (from sound and universal science to hybrid forms of situated knowledge production and from parliament-centrism to pluriform governance processes). As we will explain below, most recent publications from that literature consider networked and project-based TA organization as the most suitable forms for such a transition.

As one would expect, a significant body of work concerns national contexts where TA is not yet institutionalized. These works refer to situations where TA practice either faces difficulties, is slowly (re-)emerging, is described as in a proto-institutional state, or is taking specific evolutionary paths (see for instance Shiroyama [2010] on the situation in Japan, Kim [2012] concerning South Korea, Ashworth [2013] regarding Australia, Stankiewicz & Lis [2015] about Poland, Peha & Morgan [2003] about the United States). All accounts refer to (Western) European realities and compare themselves to the evolutions that occurred there in the last decades. But they also suggest that the institutionalization may actually play out very differently from those realities. It is indeed generally acknowledged and reiterated throughout the TA literature that “transfer” solutions do not work straightforwardly (Vig and Paschen 2000, Delvenne 2011). The following paragraphs will focus on an overview of organizational forms taken to be particularly suited to given contexts such the post-OTA United States, Eastern and Central European Countries, Japan and a number of developing countries.

Sadowski and Guston (2015) describe the US-American post-OTA landscape of Technology Assessment as being loose, uncoordinated, distributed and bottom-up without a clear institutional leader in terms of best practices. After the closure of the OTA in 1995 (Kunkle 1995, Bimber 1996, Bimber & Guston 1997, Herdman & Jensen 1997), a series of TA functions have been taken over by the Government Accountability Office (GAO) in the Congress. In addition, there are several other TA activities occurring throughout the country. Often cited examples are the Centers for Nanotechnology in Society at Arizona State University (CNS-ASU) and at University of California, Santa Barbara (CNS-UCSB) that were granted a percentage of a nanotechnology research program to accompany its societal, ethical and environmental aspects. A similar approach was first initiated for the Human Genome project and its respective program for Ethical, Legal and Social implications. Those developments are less concerned with establishing TA institution; rather they aim at integrating real-time TA (a combination of

research, training, education and engagement) into anticipatory governance (Barben et al. 2008), thus targeting the science and innovation system in a broad, decentralized and multi-level manner. In addition, the above-mentioned authors point at several other entities which conduct TA work in the US, for instance some governmental agencies, NGOs, think tanks and policy advocacy groups, science academies and media platforms, but they stress that, in such settings, TA is often just one activity among many others. Hence, the situation cannot only be described as distributed, bottom up, flexible and uncoordinated capacities around broadly shared functions; it is also set apart regarding resources, methodologies, interests and objectives. However, *“it is difficult to point to one primary cause for this form of distributed governance”* (Sadowski and Guston 2015: 55).

Others authors tend to go a step further and embrace certain organizational forms, thereby speculating about the TA of the future. R. Sclove (2010), on behalf of the ECAST network (Expert and Citizen Assessment of Science and Technology, an advocacy group for participatory Technology Assessment) also proposes an institutional network for the post-OTA era in the US. He suggests a *«21st-Century Structure: develop a partially decentralized, agile and collaborative organizational structure, seeking TA effectiveness, low cost and timeliness.»* (Sclove 2010: xi). Expected benefits are that *“an ECAST institutional network model could have the flexibility to organize technology assessments not only for Congress but also for the executive branch and for state or local governments”* as well participate in multi-national projects. Furthermore, the model *“would be able to select and frame topics more creatively, pro-actively or participatively than could an agency such as OTA, which, while it did informally suggest topics to Congress, was largely forced to focus on the topics assigned to it. Operating outside of the direct line of fire of partisan Congressional politics, an ECAST network could also experiment more freely with new TA concepts and methods”* (Sclove, 2010 :9). The ECAST group, despite being *“marginally institutionalized”* (Sadowski & Guston 2015: 57) managed to participate in several prominent TA projects in the US. Also in the American Post-OTA context, Morgan, Peha and Hastings propose a *“lean, distributed Organization to serve the Congress”* (2003: 145).

The mainpoints in common for these authors can be roughly summarized along the following lines: a clear preference for decentralized and minimalist organizational forms based on agile (and collaborative) networks using existing resources, which leads to low cost and timeliness, and stimulates creativity, experimentation and proactivity. The TA work then mainly consists of projects for multiple clients on sub- and supra-national level of policy-making and innovation systems.

Leaving the US context to focus on Europe, Hennen & Nierling (2014), based on results generated by the PACITA project, analyze initiatives to strengthen knowledge-based policy-making in eight European countries that do not have formalized structures of Technology Assessment. The authors came up with a threefold typology of actors and strategies. First, there are “supporters of the Parliament” that continue more or less to advocate the models of existing PTA organizations. Second, they coin the term “institutional traditionalists”, who aim at taking up TA functions in already existing structures (for instance, Science Academies). Third, they identify a third category of actors, “innovative explorers”, who pursue a “network model of TA”. To illustrate the emergence of that category, they notably point to NGOs in Lithuania and Bulgaria as examples for the strategy to establish “*smaller, independent networks of ‘TA working groups’*”¹¹ (Leichteris 2013: 232; about Lithuania). In the case of Lithuania, authors like Leichteris and Stumbryte (2013) or Leichteris (2015) further insist on the importance of so-called “gatekeepers”. “*The aim of the network and further steps of implementation shall be to put efforts and create political stage, promote debate culture and provide examples of real life products.*” (Leichteris and Stumbryte, 2013: 206). This network model is said to be particularly suited for the “*the exploration and starting phases of national TA initiatives serving as a platform to share knowledge and to connect relevant actors. Its practicality however has yet to be proven.*” (Hennen & Nierling, 2013: 41). Furthermore, according to the same authors, “*specific ideas about how to institutionally build [the network] into the existing system are [...] missing.*” (Hennen & Nierling, 2013: 26).

The funding options for such networks are also explored (new national innovation strategy in Bulgaria and European structural funds for Lithuania), as it looks like they will start by taking the form of thematically oriented, third party funding limited in time. The notions that call for our attention here are the following: **innovative solutions** (as opposed to institutional traditionalists, i.e. the way other PTA organizations have emerged and evolved); **small and independent**¹² **networks and platforms**, the idea of **sharing knowledge**; the importance of **gatekeepers**, i.e. people able to circulate in-between different social worlds; the **implication of NGOs**, the valorization of **debate**, the importance of **best practices**, **pilot projects** or even **knowledge imports** to connect with (national or international) innovation policies.

As another example, Japan has a tumultuous history of TA institutionalization attempts. Shiroyama (2010) notably puts forward that Japanese TA tradition of the 1970s was

¹¹ Those propositions are however, not new and were already raised in the early discussion about TA in Europe during the first European TA conference (Vig & Paschen (2000: 14)

¹² The concept of independent in this particular context as understood by the Central and Eastern European countries refers much more to preventing influence from the government than for instance from private actors. Reasons for that are probably to be sought in the communist heritage of these countries.

narrowly based on engineering approaches and strict scientific methodologies that do not take into account wider societal context and were *de facto* useless for policy makers. Today, the author envisions different institutionalization scenarios: TA body at the government level; TA as an integral activity of specific research programs; private and voluntary activities; and international institutionalization throughout the Asian region. Organizational wise, Yoshizawa (2016) envisions a Network Administrative Organization. *“This may entail a new form of governance. In network governance, participants themselves collectively govern the networks as shared governance, or a sole network participant takes a role of lead organization and governs the network. [...] The network can be governed either through mandate or by the members themselves with a network administrative organization (NAO). As a network broker to coordinate and sustain the network, the NAO may be a government entity or a non-profit organization. As network members are called upon to collectively monitor the actions of NAO leadership, trust across the network can be higher than lead organization governance.”* (Yoshizawa 2016: 40). Furthermore, the author specifies that this distributed governance shares local, decentralized and multi-level decision-making among a diversity of economic, societal and political actors in rapid changing environments with a flexible manner. This “third generation TA”, as Yoshizawa coins it, is primarily characterized by activities, not by an organization¹³. Here, institutionalization is envisioned through *“embedding the necessary functions into society”* (Yoshizawa 2016: 41), notably by relying on existing resources. Doing so, according to the author, would overcome the above-mentioned fragility of TA as intermediary bodies or boundary organizations (i.e. organizations mediating between different social worlds - generally scientific and policy, notably by using interpretative flexibility as a productive resource in the mutual interest of both worlds, cf. Guston 2001). Such bodies generally lack trust in Japan, particularly when they come from the research community. However, Yoshizawa notes these research communities are becoming increasingly plural in their affiliations, which opens up possibilities for inter-organizational networks and collaborations.

Let's now turn to the context of developing countries and scarce resources to discuss another strand of the literature of futures of TA. Ely, Van Zwanenberg and Stirling (2011) oppose the old-fashioned *“glass and concrete TA”*, as they qualify the first generation (OTA) and part of the second generation of TA (European EPTA members).

¹³ This idea links with the idea expressed by Nielsen (2014) about the institutionalization of DBT after its restructuration in 2012. He suggests not reducing its continuous institutionalization to only a defined organizational entity or a *“formal placement within existing systems, such as governments or parliaments”* (Nielsen 2014: 79). Instead, in his view of institutionalization, he stresses the importance of legitimacy derived from repeated actions such as events, projects and public statements that *“grow to become an expected part of the way things work, i.e. “institutionalized” [and] [...] different actors in the field, which become attached to those practices over time.”* (Nielsen 2014: 79-80).

Following a rationale of broadening out inputs¹⁴ and opening up outputs¹⁵, the authors call on creativity and reconfiguration of TA organizations as-we-know-them and propose a TA model that would be *“less onerous and costly than centralized, technical approaches in terms of resources and the in-house expertise required”* (Ely et al., 2011: 23). Instead of *“a country-based, government-led, ‘glass and concrete’ technology assessment office”*, the researchers advocate a *“more transnational, networked, virtual and flexible [...]”* approach to TA. Such a model would rely on a network of (private, public and civil society) organizations that would make outputs more widely available, both to a larger set of beneficiaries as well as spanning over national borders (Ely et al., 2011: 18-19). Furthermore, such TA would make use of web2.0 possibilities in order to significantly reduce costs. Being flexible and interdisciplinary allows it to *“address a range of technological issues across various disciplines simultaneously, and respond more rapidly to request for information or advice on a broader range of topics”* (Ely et al., 2011: 26).

The elements we retain from those authors are: **the cost saving argument** in a context of scarce resources; **the creativity in methods** and **flexibility and timeliness in response** to requests; the **decentralized, multi-actor** (public, private and civil society) and **multi-national network configuration**, the **multitude of potential users** and addressees and finally the use of **virtual infrastructure**.

Much of this programmatic literature, sometimes authored by TA practitioners themselves, emphasize the importance of actual practices and to various extents dismiss the perspective of big administrative TA organizations. In order to assess and operationalize these propositions and prognoses, we need to build on them to establish an analytical framework. For this reason, we propose to disentangle two always-intertwined but somehow neglected dimensions that we find in the broader context of TA: the conception of knowledge and the vision of policy-making embedded in different forms and rationales for TA. This will help us situate the evolution of TA so far and problematize the possible future pathways of TA.

¹⁴ *“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”* (Ely et al. 2015: 58).

¹⁵ *“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. [...] This means highlighting symmetrically a number of in-principle contrasting but equally valid interpretations for appropriate ways forward, each with its associated assumptions, rationale or contexts (Stirling 2010)”* (Ely et al. 2015: 58).

3.The broader context of TA, present and future: Shifting modes of knowledge production, public management and decision-making

The present section aims at describing a transformative move in the last decades through which the understanding of public decision-making and management processes as well as related practices have dramatically complexified. After describing these evolutions, mainly relying on selected literature from public management and STS, we will especially be attentive to the way such conceptions and reforms may be taken up by TA entrepreneurs (both actual and potential) and contribute to frame their understanding of their respective environment and how this contributes to orient their action.

With the shift from Parliamentary Technology Assessment to policy-oriented Technology Assessment and our focus on the latter term, we need to be sensitive to the broader transformations of the state and public decision-making and management more generally. In order to contextualize this shift and grasp its implications, we make use of the work of Politt & Bouckaert (2011) on the public management reforms over the last decades, which they define as *“deliberate changes in the structures of public sector organizations with the objective of getting them (in some sense) to run better”* (Politt & Bouckaert 2011: 8), without specifying what “better” means whatsoever. As an indication, we relate the identified periods with different moments in the history of TA. While we not to take the step of explicitly pointing to a causal relationship between them, we find it helpful to situate evolutions in TA practice and scholarship in the broader context of shifting decision-making and management processes.

The authors identify a first period around the 1950s – 1960s during which public management was seen as a primarily technical or legal matter in the hands of the national state and its modern and well-defined institutions. There was little international debate or comparison in that matter and multi-national management was just in its infancy and only about to take off decades later (in the 1980s). Around the 1960s and 1970s followed a period described as *“the golden age of planning”* (Politt & Bouckaert 2011: 9), where *“science and expertise will produce progress”* (ibid: 11) notably with the collaboration of the social sciences *“of a more rational ‘designed’ set of policies and institutions”* (Ibid: 6). Within this period, a first wave of change occurred at the end of the 1960s and beginning of the 1970s, predominantly in the USA, the UK and France and aimed at *“rational strategic policy-making and evaluation”* (Politt & Bouckaert 2011: 6). This period and rationale corresponds to the *Zeitgeist* in which the OTA was put in place.

A number of key reforms followed the global economic downturn of the 1970s, which fueled perceptions that governments were spending too much and the welfare state was becoming increasingly unaffordable. During this period, the crisis of public finances, the growing discontent of citizens towards their administration and the development of information technologies have been used as arguments to “reinvent the State” through new public management (NPM) in the US, in Commonwealth countries and for instance in countries of the Benelux and Switzerland (de Visscher & Varone 2004: 178 our translation). Former US President Reagan and UK Prime-Minister Thatcher were at the political forefront of these business-like and management-inspired reforms, which were accompanied by a series of scholarly concepts, methods and values which, we hypothesize, may have more profoundly impacted visions, rationales and practices of Technology Assessment than usually acknowledged in the literature on present and future forms of TA. In the 1980s, this trend concerned with public cost savings, boosting efficiency and fostering responsiveness towards the public considered as a collective made of “citizens-users” (Politt & Bouckaert 2011: 6) continued to spread geographically, often with the support of international organizations such as the OECD and the World Bank.

Although divided by internal differences, key aspects of the New Public Management can be resumed as following:

- The importance of the notion of performance, preferably quantitatively measured via outputs.
- The “*preference for lean, flat, small, specialized (disaggregated) organizational forms over large, multi-functional forms*” (Politt & Bouckaert 2011: 10).
- The use of market-type mechanisms and contractualizations (calls for tender).
- The conception of service users as clients or customers with subsequent attention to quality management.

As a result, public sector organizations got increasingly fragmented and “*large multi-purpose forms*” gave way to “*single- or few-purpose organizations, each pursuing more explicitly defined sets of goals and targets*” (Politt & Bouckaert 2011: 7). The NPM and market forms of organizations were notably influenced by neo-institutional economics.

Another significant change was induced with information and communication technologies (ICT), which brought about the concept of “e-government”¹⁶ and its promises of more efficient services and information sharing as well as expectations in

¹⁶ Politt & Bouckaert (2011) make clear the e-government is not a public management model in itself nor is it the prerogative of a particular model. In a variety of public management constellations, it can be found “*an e-government that reinforces traditional bureaucratic hierarchizes, an e-government that facilitates NPM [New Public Management], an e-government that is designed to promote networking and wider concepts of governance*” (Politt & Bouckaert 2011: 7).

more participatory forms of democracy. Roughly speaking this period coincides with the erection of the first TA organizations on the European continent. As this coincided with a greater public scrutiny about the size of public administrations, it may not be surprising that those offices indeed turned out much smaller in human and financial resources than the OTA¹⁷, nor that some of them began outsourcing part of the TA assignments.

Subsequently, since the 1990s, to counteract negative impacts or to respond to criticisms of NPM rationales, key concepts like “*globalization, governance, networks, partnerships, transparency, and trust*” (Politt & Bouckaert 2011: 11) started to merge with the NPM-inspired reforms. New Public Governance (NPG) has sometimes been portrayed as an overarching model that grasps these new developments and “*attempted to move beyond the old arguments between the state and business, and to show that complex modern societies could only be effectively governed through a complex networks of actors, drawn from government itself, the market and civil society. The emphasis was on networks, partnerships, and negotiated but ultimately voluntary cooperation, not competition (like the NPM) or enlightened and professional hierarchies (like the NWS [Neo-Weberian State])*” (Politt & Bouckaert 2011: 23). Although their origins are more complex, those last changes correspond to the then increasing trend with public participation and a widening of addressees of TA knowledge and activities observed within the TA community, which soon started to structure itself (i.e. the creation of the EPTA network in 1990) and to initiate collaborations in the framework of European projects (such as for instance “Technology Assessment in Europe: between Method and Impact” [TAMI] or “European Participatory Technology Assessment” [EUROPTA]). Let us describe more in detail some central elements of this New Public Governance: the concepts of networks and projects as well as those of governance and participation.

3.1. Networks and projects

Networks both converge and diverge from NPM rationales.¹⁸ They are flexible and horizontal and thus better fit the perceived complexity of contemporary societies. However, networks are distinct from (or a combination of) both hierarchic and market-based modes of public organization. The network is one of the most recent forms of organization and it seems that its rise is partially related to former failures of hierarchy and market forms. Its underlying principles are cooperation and solidarity. It is

¹⁷ This additional point however does not contradict the above-mentioned influence of the specific European political cultures on the evolutions TA took on the continent.

¹⁸ This is partially due to its ambiguity as umbrella term. The concept is still debated and differently conceptualized in scholarly community, notably regarding voluntary participation or necessary membership in networks, horizontal relations or new forms of dominance, their informal or formal character and so forth. Also, if it draws significant attention today, the concept is by no mean new and its prevalence and growth is empirically difficult to account for.

exemplified through shared values trust, reciprocity and consensus seeking for tackling problems. The network form can be illustrated for example by the trend from government to governance, in the sense that policy-making must include a broader range of actors to be effective. In practice, a network approach would see the government as a network enabler, manager or/and participant to deal with complex or wicked issues (Bouckaert, Peters & Verhoest 2010). Scientific inspiration for this paradigm comes from practices as diverse as cybernetics, neurosciences, systems analysis, science and technology studies or managerial literature.

Networks and projects also mutually permeate. Projects are a salient form of engagement and cooperation in the network organization (Boltanski & Chiapello 2005). Projects can be understood as the continuation of the contractualization initiated in NPM. But contrarily to the market order, they evolve around “co-opetition” - a neologism that synthesizes cooperation and competition and overcomes their antagonism (Boltanski & Chiapello 2005). The project concept also unfolds in its double sense: first, the characteristic that binds a project to a clear objective and a defined time-horizon and allocated resources and, second, the idea of a (shared) endeavor, a plan, something to commonly strive for. The NPM remains strongly influenced by “managerial determinism”. A similar “project-managerial determinism” may indeed become true for NPG as a body of literature on management and learning in temporary organization forms, project-based work and network-firms attests¹⁹. In the realm of TA, next to the central idea of “networks”, the concept of “projects” also gained a prominent place. Beecroft & Dusseldorp (2012) argue that TA may be condemned to remain at a project level. Grounding their analysis in experiences of teaching TA, it seems that because of the different disciplines it relies on, systematization and thus stable institutionalization of TA are therefore a major difficulty beyond the project-level. Bogner (2014b) makes a similar point with what he calls “project-shaped participation”. He considers that (upstream) participation exercises become increasingly project-shaped, which means (1) carried out by professionals, (2) third-party project-funded, (3) people need to be actively invited to participate without reference to existing controversies and thus with an unclear role.

3.2. Governance and participation

Also in the 1990s the term “governance” has gained significant prominence. As the term “network”, it is equally equivocal. The core idea however is “*that steering society or making policy increasingly requires the active participation of a range of actors in addition to government itself*” (Politt & Bouckaert 2011: 21). Government does not

¹⁹ “*The process of ‘projectification’ (Boltanski and Chiapello, 2005) through which project managers have legitimized their role, and greatly expanded the boundaries of their own jurisdiction to colonize new domains*” (Muzio et al. 2011: 447).

disappear but increasingly has to compose with other governments, business representations and civil society organizations (also often described as stakeholders).

As Bellamy & Palumbo (2010) put it, the concept marries quite well with that of networks. *“Governance entails a move away from traditional hierarchical forms of organization and the adoption of network forms. It also entails a revision of the relationship between the state and civil society in a more participatory direction. Governance is finally said to be responsible for shifting the emphasis away from statute law to more flexible forms of regulation and implementation. The state is thus claimed to supersede by a ‘network polity’ where authority is devolved to task-specific institutions with unlimited jurisdictions and intersecting memberships operating at sub- and supra-national levels.”* (Pollitt & Bouckaert 2011: 21-22). In addition, both concepts are also normatively laden and used both as analytical tools (e.g. network analysis [Granovetter 1973] or actor-network theory [Callon 1986]) and action-injunctions (e.g. “we should network more” or “we should improve good governance”).

Participation has also played an important role in the unfolding of the new public governance paradigm. Participation and governance are also equivocal. Thorpe (2008) argues that while neoliberal economic order, globalization and associated readings of those terms tend to restrict the terms and scope of political discourse and narrow down political possibilities, new social movement simultaneously take them up to open new sites of political struggle, notably in relatively technicized domains. Participation has become both a top-down injunction or formal requirement and a bottom-up social demand to which governments ought to be responsive (cf. the “deliberative imperative” see Blondiaux & Sintomer 2002). Participation today is invoked by policy-makers, civil society organizations and scientists alike in both public affairs and *“in anticipation of sociotechnical challenges and opportunities”* (Van Oudheusden 2011:13). Clearly, in the TA communities, participation captures both a normative agenda to strive for (i.e. democratizing technological choices through participation) and a set of practices to make that agenda happen at the level of concrete projects.

Although briefly sketched, these developments are informative to our analytical framework because they show us how public action (both policy-making and public management) has progressively moved away from “modern” conception of central administrative, bureaucratic, rational command and control state towards different reforms first inspired by the market and then by networks and governance. The broader context in which TA took roots and developed has turned out to be increasingly complex and contingent and, importantly, it has become the prerogative of multi-actor, multi-level and multi-value constellations.

4. Applying those evolutions to TA: beyond teleological explanations

In a number of important contributions applying sociological and STS theories to technology assessment, we find that little attention has been paid to shifting modes of public decision-making and management processes, i.e. the broader context sketched in the previous section. Yet, we hypothesize that it is illuminating to locate TA institutions, rationales and practices (both present and future) within those broader developments and to spotlight how exactly they connect with cross-cutting concepts such as “governance”, “network” or “project”.

To make this point clear, we suggest a couple of examples to better grasp both the advantages and the limits of applying what we call “teleological theories” to TA. First, based on the theory of “reflexive modernization” as proposed by Beck et al. (1994), Delvenne identified two fundamental traits of this sociological theory that apply to TA as an instance of reflexively modern societies: the openness to plurality and the blurring of boundaries. The openness to plurality refers to a set of procedural qualities, the acknowledgement of a plurality of values as well as the nature of TA’s outputs. This refers to the participation of stakeholders’ and citizens’ views (including minority’s and marginalized perspectives) in TA methodologies so to make the knowledge socially more robust (Nowotny et al. 2001 cited in Delvenne 2011) but also to the production of plural and conditional outputs and recommendations (Stirling 2008). The blurring of boundaries concerns the “modern” distinctions between nature and society, facts and values, politics and non-politics, and so on (Latour 1991). This dimension is concerned with the way in which uncertainty and ambiguity are reflected in the TA process and how those boundaries are shaped in “*dynamic, pragmatic and context-dependent way*” resulting in “*an inclusion/exclusion process that is revisable, evolving and heterogeneous, [...] constructed, bargained, negotiated and appropriated by stakeholders, within a specific iterative learning process.*” (Delvenne et al. 2011: 39).

The second theoretical approach we want to stress here is the opening up (and necessary closing down) of technological appraisal by Stirling (2008)²⁰. Regarding the practice of TA, the idea has been taken up more programmatically by and Ely, Van Zwanenberg & Stirling (2011, 2014, 2015). The authors advocate a greater attention to broadening out inputs and opening up outputs of Technology Assessment exercises (see above).

²⁰ This theory, independently of its succeeding applications to the field of TA, has also been used by Delvenne 2011. However, we will mobilize it under a slightly different and original angle. In addition, it has become part of a theoretical framework in its own right to reflect on the future of TA, as we stressed above (see for example Ely et al. 2011, 2014, 2015).

Both theories yet insufficiently address the evolutionary assumptions in the conceptions of policy-making and knowledge production processes. In Delvenne’s (2011) case studies and categorization of different generations of TA, the evolutions seemed to equally go along both dimensions (openness to plurality and blurring of boundaries), even if he stressed that TA institutions usually progress along one dimension at a time. Figure 5 is taken from his work and it reads as if the different TA generations had evolved chronologically (from the 1970s to the 2000s) along both axes of “openness to plurality” and “blurring of boundaries”.

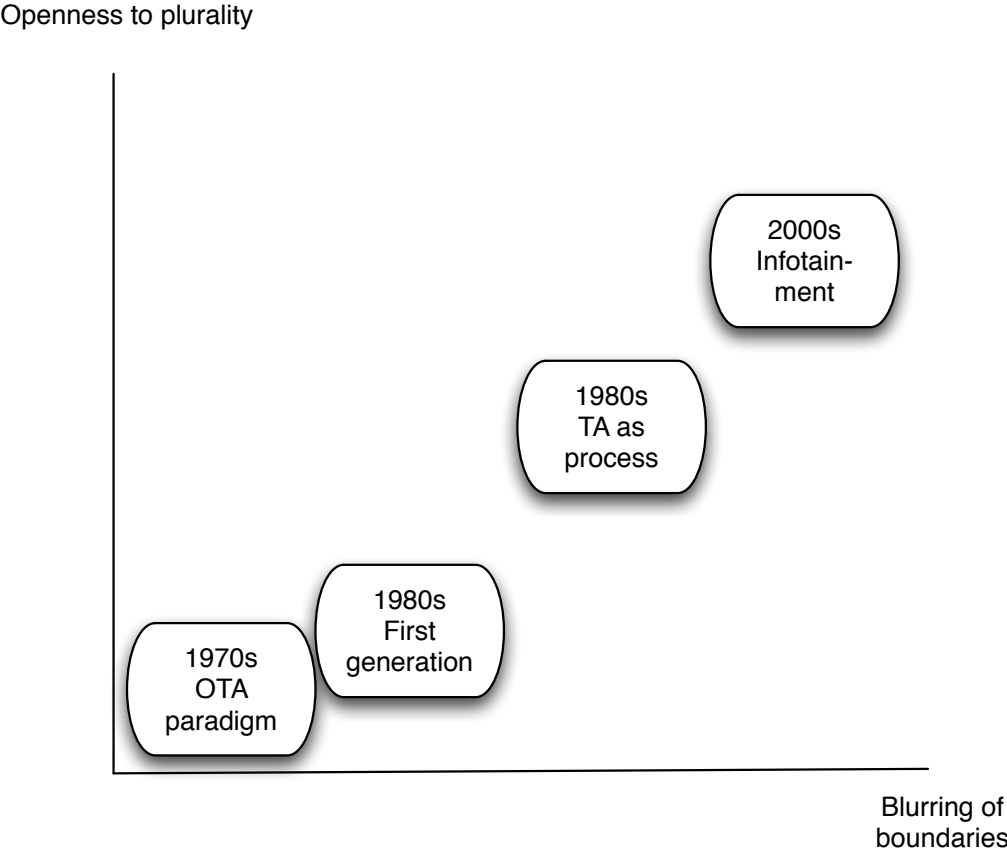


Figure 5: Openness to plurality and blurring of boundaries applies to different generations of TA Source : Delvenne 2011

Our point is that in this literature, we often witness what Irwin (2014) calls a “*from... to...*” narrative, indicating the idea that “old” approaches are supplanted by “newer”, more informed, accurate and contemporary ways of both envisioning and performing science and governance and the relationship between knowledge and social order²¹.

²¹ Irwin (2014) notably reflects this in matters of participation, when deficit conceptions (public

Let's transpose Irwin's reflection below about Public Engagement with Science and Technology at a more general level of the science-policy interface. *"In the end, there is a strong element of personal preference in whether one chooses to emphasize the changes that have taken place over the past decades or the deeper continuities beneath those changes. Two decades later, I am less inclined to think in 'from... to...' terms and more likely to view scientific governance – including the particular issue of public engagement with science – as an often messy and contradictory business where dilemmas and paradoxes abound."* (Irwin 2014: 74).

This point raises the question about the many possible combinations of governance and scientific approaches and more specifically those that do not fit the narrative of opening up or reflexive modernization. Furthermore, Stirling (2008) himself indicates that such a reading entails an often *"neglected normative property of direction"* (2008: 263).

To address these limitations, figure 6 below sketches our attempt at reconstructing the twofold evolutions portrayed in the sections above, thus speaking to both policy action and to scientific processes and the possible ways they may converge within TA. To recapitulate, the first evolution concerns an ongoing shift in the conception of "public action" away from the centralized nation-state and its modern and uniform institutions towards shared multi-level, multi-actor and multi-value governance. The second evolution occurs in the conception of knowledge as something broader and more open-ended and inclusive, situated and uncertain than the positivist and narrow framing of universal science or "hard" scientific evidence. Waterton & Wynne (2004) deliver an exemplary case in that regard with their study of the European Environmental Agency. This European organization, which provides scientific environmental data for European policy-making has gone through a twofold struggle. From the earlier conception about the European integration project as a super-State, which requires standardization and harmonization of *"objective, reliable and comparable"* (Waterton & Wynne 2004: 88) scientific data across national institutional and cultural landscapes, it evolved into a more experimental and subsidiary approach to European environmental policy-making that reflects on the local and *"encultured"* knowledge produced in various countries. It thus opposes two visions of how scientific and political order mutually coproduce each other (Jasanoff 2004). On the one hand, a modern, centralized, command and control conception of the state, which relies on *"hard and fast information"* (Waterton & Wynne 2004: 92). On the other hand, a more experimental, distributed, plural, deliberative European polity in the making, which builds on disparate forms and providers of knowledge and recognizes its situated character and parts of indetermination and uncertainty.

understanding of science and technology - PUST) are supposedly replaced by dialogue or public engagement with Science and Technology (PEST).

The yellow arrow represents the existing narrative about the evolution of TA and how it conforms to the shifts along both of these lines. It roughly equates the “reflexivity pathway” (Delvenne 2011) or the “opening up” advocated by Ely et al. (2014). Accordingly, some PTA organizations already perform “better” than others on those two dimensions. The literature on futures of TA already indicates that it would culminate with networked and project-based TA activities, freed from “modern” “glass and concrete” institutions and therefore able to embrace constructivist, post-positivist and context-sensitive knowledge for multi-level, multi-actor (and multi-value) governance. However, we hypothesize that it is likely that such a narrated success story collapses in the face of empirical evidence about futures and actual remakings of Technology Assessment. Or at least, we turn this into an empirical research question.

Assuming cross-fertilization with these scholarly insights, we argue that those shifts have unequally affected the TA discourse, its practice and institutionalization. TA *“has always been linked to what has been called a ‘post-positivistic’ (Heretier 1993) conceptualization of policy-making, taking into account the inborn uncertainty and under-determined character of scientific knowledge with regard to complex practical (political) problems as well as the indispensable need to take into account different (and often conflicting) values, normative claims and expectations held by societal groups. TA was, and is, holding to a notion which nowadays is dominant in most conceptualizations of the relationship between science and politics (Functowicz and Ravez 1992, Nowotny et al. 2001; MASIS Group 2009).”* (Hennen & Nierling 2014: 11).

In other words, the yellow arrow shows that PTA has over the years diversified its approach from a solely expert-based approach delivering evidence to national parliamentary institutions (often referred to as “first generation”) to a coexistence with more complex, open-ended and participatory appraisals of sociotechnical issues (often referred to as “second generation”). This second generation is sometimes normatively described to be an “improvement”, “dominant” or taking on-board the lessons from the limitations of scientific advice for command and control policy-making. Consistent with its progression along the arrow, PTA can play a diversity of roles (in a division of labor with other organizations and actors) in a *“hybrid and pluriform governance process”* (Bijker 2014) at different sub- or supra-state levels, supporting decision-making for a diversity of public, private or societal actors.

Rather than being solely attentive to what would confirm the diagnosis of a progression of PTA along one pathway, the research questions guiding us are concerned with possible alternative combinations or paradoxes that would contrast with this narrative of twofold evolution. Examples abound²² at the science-policy interface where either the

²² On the micro (project) level numerous studies have been conducted to illustrate the consequences of framing, some drawbacks of participation and shortcomings in addressing policy-makers. Van

scientific process remains positivistic or linear or the policy process is still understood in hierarchical and modern terms. Following Irwin (2008, 2014) rather than considering such situations as incoherencies or relics of old paradigms, the assemblages of seemingly incompatible elements of knowledge and socio-political orders open up alternative pathways (or remakings as we like to call it) for the practice and organizational development of TA.

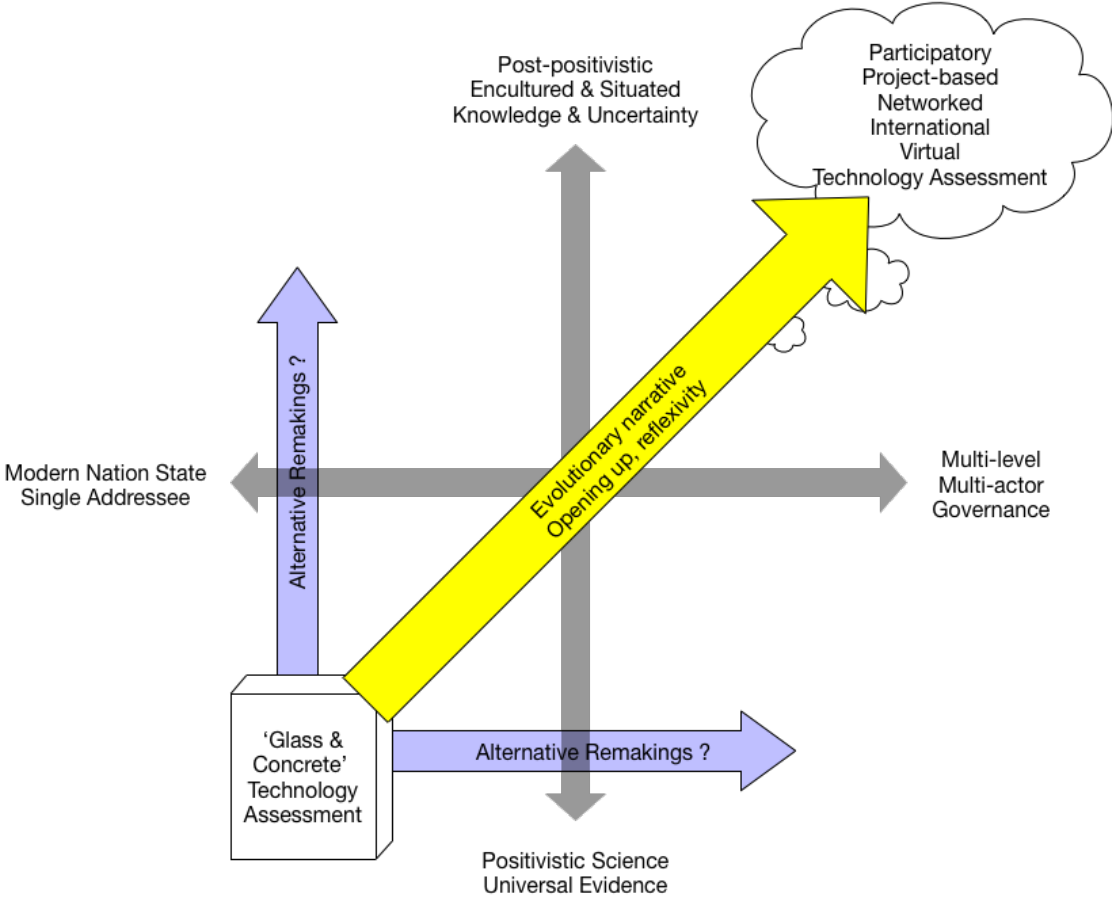


Figure 6: Graph depicting the continuum of conceptions of policy-making and knowledge along two axes

5. Where does TA go? Remaking Technology Assessment

This diverse and disparate “nebula” concerning the “third generation” (Rip 2012, Yoshizawa 2016) or “third wave of Technology Assessment” (Hennen and Nierling, 2014) partially takes up shortcomings and critiques of the second generation and is

Oudheusden (2011) has for instance shown how in a particular pTA setting, TA practitioners continued to think and enact linear conceptions of public engagement and more broadly the relationship between science and society.

mostly concerned with the adaptation of TA to new geographical and political horizons under new socio-economic, cultural and technological framework conditions. The terms of this expansion are important to grasp the overall evolution of the TA community or the different communities held together under the TA banner. By the inclusion of new actors into the TA community, we make the hypothesis that the community itself changes. It forges new actors and discursive alliances. Some actors and discourses are pushed to the periphery of the field, while others become more prominent.

The financial and economic crisis of 2008 and the resulting shortage of public finances have been used as an argument to downscale existing TA institutions (Roskamp, 2012) and refrain from creating new ones. Yet, what we will see in the following chapters are a series of coping strategies both initiated in a top-down fashion by governments and in more bottom-up processes by TA actors organizing themselves in new and evolving collectives (disciplinary, technological, institutional and human). The subsequent case studies show how networks, projects, e-infrastructures and synergies with other practices will play an important role in feeding those coping strategies.

TA does not just evolve; it is actively caught in a twofold and intertwined process of remaking. Firstly, it is concerned with making “more of the same” (Schneider & Lösch 2015). A number of projects and actors, including PACITA, are or have been engaged in rather normative projects of spreading parliamentary TA to new places in Europe and beyond. This has been described as a “*rather conservative vision [...] envisioning more of the same*” (Schneider & Lösch 2015: 70) in the sense of continuing the institutionalization of Technology Assessment throughout Europe based on the existing practices and recognized experience of PTA institutes. In such a view, inspiration is sought from existing institutional arrangements and practices and it often results in a deficit description where countries are set apart from one another depending on the existence of a formal organization dedicated to Technology Assessment; as if for TA one should distinguish the haves and the have-nots (see PACITA chapter 2).

Secondly, not only do existing TA institutions evolve (some are dismantled; others shift their activities, change their name or redefine their mission statement) but new actors also enter the scene under the objective of “expanding the TA landscape” (see PACITA chapter 2). In other words, with the expansion of the community also grows its diversity. In this second understanding of remaking, the concept qualifies a (unintended) process of ontological transformation of the practices of and the organizational framework for Technology Assessment. Critical new questions arise as to what qualifies as a TA practitioner or what counts as a TA organization.

Rephrasing Jasanoff, TA gets caught up in the interplay of “[re-]making identities, [re-]making of institutions, [re-]making discourses, [re-]making representations” (Jasanoff

2004: 6). “Remaking” is thus concerned with the interplay between the European objective of the Knowledge-based Society, its national and regional enactments and the peculiar developments in the field of Technology Assessment. As we will further develop, “remaking” concerns both reproduction and transformation as it affects dominant conceptions of policy-making and knowledge; but as a concept, remaking also illuminates how TA organizations are envisioned and how the TA practices makes community. Indeed, under the auspices of the PACITA project, new collectives of both TA practitioners and users of TA knowledge have been crafted, raising questions of interdisciplinary work, affecting the relation between realistic and relational expertise (Ganzevles & van Est 2012) and between different forms of engagement with TA. New organizational forms and institutional arrangements have been experimented within existing entities, in temporary settings or *sui generis* organizations. Original discourses about the needs for TA have started to emerge and they have sometimes considerably varied from the ones pronounced in the early days of TA. It is to these interesting assemblages about the futures and remakings of TA that we will now turn in the next chapters.

CHAPTER 2 - The PACITA Project – Doing individual research parallel to a collaborative mobilization project

1. Introduction

Firstly, we introduce the collaborative PACITA project as the context for and fieldwork of the present individual PhD project. PACITA, both its design and content, contributed to operate a first tailoring and narrowing down of our research question while it also constituted the common starting point of the three national/regional case studies; and vice-versa, as our case studies all along have been narrowly connected to the platform constituted by PACITA. But PACITA is indeed also a fieldwork of its own, comprising normative dimensions that need to be unpacked because they relate to some tangible achievements concerning the practice of TA (present and future) on a more general level than the one of single countries. Secondly, and consequently, as a researcher embarked in an intervention-oriented project, so as an analyst and an actor of the PACITA project, we needed to establish a methodology that would go beyond participant observation. The methodology we developed is based on “insertion”, an embedded analytic posture made of a series of “moves” which helped us to uncover and make sense of the normative aspects of the project to a fuller extent. A mapping of the different positions we have been attributed during the project will make clear how our insertion in PACITA led us to occupy alternating roles such as, for example, the ones of “good student”, “promoter”, “outsider” or even “traitor”. This embedded methodological posture allowed us to take stock of the effects (and affects) of the project rationale onto our research, either when observing the dynamics at play within PACITA or when conducting fieldwork for national case studies. Unveiling the normative dimensions of PACITA also stresses how a particular framing is deployed throughout the PACITA endeavor. The way the project call was first conceived by the Science in Society directorate of the European Commission, and then how it was answered and performed by the consortium, contributed to frame a certain understanding of Technology Assessment, its evolution and its institutionalization. In particular, sometimes explicitly and often implicitly, PACITA’s framing pointed at Participatory Technology Assessment performed by single independent institutions on the national level as the one-best way. The (unintended) effect of such framing has been the construction of a deficitary and evolutionary description of TA practices, TA organizations and even so-called TA countries. As a result, concerns about reducing this deficit and closing the gap between “PTA countries” and “non-PTA countries”, combined with the common strive towards

more institutionalized PTA practices, became the flagship of the whole project and subordinated nearly all other activities to this objective of “expanding the TA landscape”. Throughout the project, this task became more open-ended and increasingly inclusive (of actions, practices, concepts, professionals and institutions), which reinforced its “experimental governance” character in addition to its interpretative flexibility. Another important normative anchor point of the project was the issue of participation or “participatory Technology Assessment”. It was not only discursively emphasized throughout the project but also concretely enacted in experimental pilot projects aiming to standardize and scale up participatory TA methodologies. This led to some discrepancies between the initial normative discourse of PACITA and the concrete enactments during those pilot projects and the visions of knowledge and policy-making they enacted. Along with this observation, we identified another shift away from the initial focus of institutional creations towards multiple ways of expanding (and differentiating) the TA landscape.

As we will see in the national/regional case studies of the following chapters, inclusiveness under the banner of TA, the experimental character of the TA promotion activities and the synergies the partners established between the increasingly vague objective and their own agenda contributed to transform today’s understanding of TA. Overall, PACITA can be considered as a privileged venue to analyze the remaking of TA – an ambivalent process concerned both with the replication of existing practices and their transformation through further uptake in new national/regional contexts by a greater diversity of actors.

2. Choosing and being chosen by one’s fieldwork

2.1. Arriving at SPIRAL

I²³ initially applied at SPIRAL for an applied research project on electronic voting advertised as a half-time position for 2 years. Indeed, my master thesis about technological democracy was, in my mind, pretty much in line with SPIRAL’s expertise in Science and Technology Studies and experiences in public participation. In the course of the subsequent job interview, my soon-to-become supervisor probed my interest and commitment to a much more consequent endeavor. In the meantime, the research

²³ Contrary to the rest of the thesis, the following section is written in “I” and sometimes in “we”. The first refers to experiences I did not necessarily do alone but that are relevant to my own and personal insertion process. The “we” refers to more collective action along with my colleague Pierre Delvenne and other SPIRAL colleagues. The “we” is more relevant when the research center gets in the focus of the relationship and insertion in the TA community. Concerning the approximation between the “I” and the “we” and even further the institution, discipline and region we are called to represent see section 3.3.

center got offered to participate in a European project on Technology Assessment. Ideally a PhD Student was envisioned for the job. Such an arrangement would allow for a full-time equivalent to be hired and in the same time devoting personnel efforts into reinforcing the young research area on technology assessment at SPIRAL. I enthusiastically accepted.

2.2. SPIRAL's involvement in Technology Assessment

Over the last years, SPIRAL got more involved in the issues of Technology Assessment. The research center was founded around 1995 around issues of risk analysis and management. It gradually opened up to public policy analysis and evaluation as well as different governance considerations in contexts of scientific uncertainty – especially around new sciences and technologies. The team is oriented towards multidisciplinary in social sciences and humanities (comprising political scientists, sociologists, anthropologists, criminologists, philosophers, linguists, historians, economists etc.) but also features researchers from natural sciences and engineering. In 2006, Pierre Delvenne, who had a background in political science, started his PhD research on Technology Assessment practices throughout Europe. His dissertation (Delvenne 2011) aimed at situating different parliamentary technology assessment institutions on a pathway of reflexive modernization (Beck et al. 1994). In addition to comparing various TA organizations throughout Europe, he also proactively engaged a broad set of innovation stakeholders in a foresight exercise to gauge their needs, expectations and hesitations with regard to the perspectives of installing a TA body in the French speaking part of Belgium (Delvenne 2009). The results of this study were publicly presented to an audience of policy-makers (Members of Parliament and the then Minister of Science Policy and Higher Education), innovation stakeholders and invited directors and staffers of European TA institutes. It ultimately resulted in a political uptake under the form of a parliamentary resolution (Kapompolé et al. 2008). In addition to various interviews previously conducted with directors and staffers of European TA offices, this event was the occasion for P. Delvenne and SPIRAL to become well known and recognized as a “TA entrepreneur” among the European TA community.

2.3. The invitation to join PACITA

Soon after he obtained his PhD and started his post-doc, P. Delvenne was asked by the director of the Danish Board of Technology, if he wanted to join a European TA project on parliamentary TA, which later became named PACITA. Until today it is not totally clear who initially referenced him and SPIRAL as a potential partner. The contacts made during his PhD and more specifically the action-research about TA in Wallonia are the most probable reasons for the solicitation. SPIRAL was not involved in the proposal-writing phase and only joined the project consortium quite late in the process.

As a university research center placed in a region without formalized TA structure²⁴ our main attributed leadership in the project was to organize and carry out two European summer schools for “users” of Technology Assessment. Of course, as a member of the project, we had to participate in plenty of other tasks too, but not as task leaders.

2.4. Embarking on PACITA as a PhD Student

My co-supervisors-to-be, Sébastien Brunet and P. Delvenne, presented PACITA to me as an opportunity to work on PACITA and simultaneously undertake a PhD research. It was obvious from the start that PACITA would fuel my own research interests. From this moment on, I started a constant back and forth play to identify synergies and probing of roles between the objectives and requirements of the project on the one hand, and the objectives and work undertaken for the pursuit of my personal PhD on the other hand. In order to best allocate time and benefit from the diverse activities foreseen in the PACITA project, I scrutinized the project description and division of work looking for potential fieldwork and additional research that could be carried out on my behalf. This is how I came to focus on issues of institutionalization of TA. Indeed, the timeline of the project was to first study the existing TA institutes as well as action and research activities aimed at investigating potential in so-called “non-PTA countries” (see below). This primary work on state of the art descriptions and comparisons of existing institutes and the exploration of future institutional options therefore became the starting point for my research intentions. By doing so, I connected with recent calls for further research. Indeed, Delvenne (2011) mentions in the conclusions of his research that the processes and dynamics of institutionalization would require more scrutiny in order to determine the organizational form PTA institutes will take and the kind of practices that will be carried out in the future under the PTA banner. I took that invitation seriously to frame my own research goals (see chapter 1).

2.5. PACITA as overarching case study and facilitation of three national fieldworks

It was soon clear that within PACITA something important was happening with regard to the present and future TA practice as well as to the development of the European community of Technology Assessment. Even before choosing the three national and regional case studies, the involvement in the PACITA project revealed some inherent tensions within the practice and community. The insertion gave original impetus for new parameters and new avenues for studying institutionalization processes of

²⁴ Which is referred to as non-PTA country/region in the project.

Technology Assessment. This is also how I understood the project's initial priority. An understanding shared with other project colleagues, as I would later learn.

Indeed, PACITA's cross-European character makes it irreducible to national/regional case studies, where challenges and dynamics can vary substantially. There are also aggregating effects, in terms of community building, that need to be accounted for on this supra-national level.

What the three subsequent fieldworks and national/regional case studies all have in common is that there is an organization active in the PACITA project working on their political territory. The baseline objectives and most of the activities are identical in those countries/regions. The PACITA activities are central but not exhaustive to understand the most recent developments in the evolutions of TA practices and their organizational uptakes.

The choice of those fieldworks was of course facilitated by and through the PACITA project. It considerably helped to provide an initial overview of the situation with regard to institutionalization, to map the diversity of actors engaged in this process and the degree of advancement in TA-related practice in the respective countries/regions. The choice of the three fieldworks tried to reflect and diversify these dimensions. In addition, the three fieldworks offered promising and unique developments and related research opportunities (host institution for research stay, available scholarships). Concretely, as the respective chapters will disclose, my research for each case study is more concerned with the role and position of the PACITA partner organization in the national landscape, the type of strategies and actions it undertakes, what kind of technology assessment practice it advocates and, ultimately, what kind of TA practice and rationale is (not) supported nationally/regionally. Finally, the locations the case studies were conducted at also depending on funding opportunities for research stays. I benefitted from additional funding from the *Wallonie-Bruxelles International (WBI)* for the one-month stay in the Czech Republic (September 2014) and from the *Fonds (National) de la Recherche Scientifique (F.R.S/FNRS)* for the two-months stay in Portugal (May-June 2014). In the applications for funding, mentioning the participation in and contacts established with the help of PACITA undeniably was a major asset.

2.6. Choosing of being chosen? Being active part of one's fieldwork

The above mentioned describes the initial back and forth between the unfolding of the PACITA project and the progressive construction of an original and personal scientific contribution. I was free to choose my fieldwork within the possibilities that the PACITA project offered and even enabled. My fieldwork was dependent on PACITA in many regards but my own research was not critical for the fulfillment of PACITA's objectives

and project plan²⁵. However, I was also inserted from the first day on into a new community that I had not initially chosen. I would soon find out, this community is in continuous restructuring, subject to internal and external power relations and struggles, dynamics of boundary drawing and storytelling about itself. As one jumps in cold water, I became immediately part of this group of fellow partners, which was at the same time my research object. Several roles were assigned to me, to SPIRAL and even to the Walloon Region we are supposed to represent in the project. The “choosing” aspect mentioned in the title of this sub-section thus also refers to the active work of engagement into the project and the heuristic value of being affected (Favret Saada 2009). Being engaged enables to grasp and experience realities that no one would have ever noticed or got access to from an outside, unengaged position. Finally, the choice of fieldwork also concerns the constant and conscious play with those roles and their alternation in different contexts.

3. The combination of (individual) research and (collective) action in practice

3.1. Doing research adjacent to normative projects.

I soon learned that applied social sciences and action research were nothing uncommon at SPIRAL. More generally since the interest for public participation awoke in me during my studies, I learned that an important portion of researchers interested in those questions also take the step of getting somehow involved in such practices and experimental settings. But it is not merely a question of getting involved. Action research pursues and tries to balance two goals: scientific research and intervention. Both are often intertwined and mutually dependent. It is not possible to generate certain insights on public participation without participating in one way or another - a classic principle of the “participant observation”, where observation alone is impossible without intervention or probing in the real world. On the other hand, participation exercises are often carried out not only with political motives but also according to objectives of scientific knowledge production.

Every third party funded project (like with state administration or commercial clients) needs to negotiate the contract terms with its sponsors so not to compromise principles of independent university research. I learned that this negotiation is not only done in the terms discussed at the beginning of the project but is also a constant work in process

²⁵ Formally, The PhD Thesis is just mentioned as a dissemination activity among a variety of other actions undertaken by the project partners.

and real-time adjustment of the researchers themselves to an evolving situation and changing relationships between the parties involved.

3.2. Research as “insertion”

Some colleagues at SPIRAL shared a similar experience with me as they voluntarily applied for programmatic and intervention-oriented research programs. It was only at a later stage of their PhD research that they took some distance from the normative components of the project and problematized them into the core of their research (Thoreau 2013, Rossignol 2016, Parotte 2016). Reflecting on the role social scientists are invited to play in such projects implies giving attention to three dimensions: “(1) *the relationship of the social scientist with the actors (s)he studies*, (2) *the political relevance of his/her work*, and (3) *the problem the social scientist deals with*” (van Oudheusden & Laurent 2013: 5).

Firstly, I will outline this process of finding an original approach and personal contribution as a story of insertion. Robinson defines insertion as an approach “*oriented towards data collection by being around, occasionally probing, and towards creating legitimacy (or at least recognition)*” (Robinson 2010: 30). The relation to change here is rather ambivalent. It should not be the first goal but insertion inevitably has effects on the real-world situation and interactions it studies, notably through the clarification it can offer to different actors involved.

The strategy of probing is also advocated by van Oudheusden and Laurent (2013) when problematizing the role of the social scientist vis-à-vis participation exercises. Endorsing a broad understanding of participation as being engaged and engaging with others, their reflection can easily be extrapolated to broader situations where researchers are embedded in normative projects. “*Rather than endorsing one approach to participation, we recommend a pragmatic attitude that implies systematic probing of the roles the social scientist assumes vis-à-vis other participants, interests, and objectives, and that enables him to continually adjust his position in view of the particularities of his situation*” (Van Oudheusden & Laurent 2013: 3).

Insertion consists of a succession of “moves” and “phases” that can be distant in time and location. Those phases were similar for all three case studies as well as the PACITA project. At first there is “moving about” that is concerned with entering “*into the substance of the developments and concerns so as to be a legitimate partner*” (Robinson 2010: 29). It consists of desk research, “*visiting and participating in physical spaces where [...] development is taking place*” (Robinson 2010: 149), doing interviews but also micro-interactions and informal conversations up to “*meso-level interactions, as in board meetings*” (Robinson 2010: 145).

“Moving in” is deepening that interaction with the actors of the studied fieldwork and perhaps contributing with one’s presence and analysis. It can lead to a certain “affection” or “take” within that field (see below).

Additionally, Robinson mentions the “aggregation and presentation of findings”. This is often a requirement to be granted access to conferences and workshops. For the researcher it is an opportunity to gather comments and feedback from within. It is an added value compared to the (one way) interviews mentioned in the “moving about” phase. However, aggregation and presentations also hold to risk of “*going native or being positioned in a service role*” (Robinson 2010:150). As a strategy to avoid this from happening, Robinson suggests that it should be followed by moments of “moving out”.

Moving out is a necessary step to “*maintain the role of researcher/analyst*” (Robinson 2010: 150) and to (re)affirm that role through self-positioning in conversations or “*visibly moving out via aggregation and presentations outside*” (Robinson 2010: 150) the world one studies.

Robinson mentions a possible last step that is concerned with embedding and negotiation of (further) projects and linking them to one’s own research interests. A lot of project-based researchers are looking for the next possible financing while still on another project. The prospect of joining follow-up projects with the same partners is often tempting. It offers the occasion for a deeper insertion and the related risk of not moving out enough for individual research purposes.

Let’s consider some of those insertion elements in my own experience as a PhD researcher within the PACITA project.

3.2.1. Moving about

To gain a deeper insight about European Technology Assessment, I first read several books and articles. Quite soon this phase moved to formal and more informal discussion during first consortium meetings. I spoke to several partners, took first notes, noticed the diversity of interest and sometimes first tensions between the consortium partners. During the first consortium meeting, our financial department had asked to specify my role as a PhD researcher by adding the clause below to the project agreement.

Objet: PACITA: Addendum to consortium agreement?

Date: 31 may 2011 09:42:02 HAEC

Dear [...]

Here is the sentence our legal services suggested for adding to section 8.4, in order for Benedikt not to be prevented to publicly defend his PhD dissertation or to publish it:

"The Parties undertake to cooperate to allow the timely submission, examination, publication and defense of any dissertation or thesis for a degree which includes their Foreground or Background subject to the confidentiality and publication provisions agreed in this Consortium Agreement".

[...]

One of the first tasks attributed to us was to document existing PTA practices. This is how, with my colleague P. Delvenne, I undertook the first interviews to get an in depth understanding of the Flemish PTA organization *Instituut Samenleving en Technologie* (Institute Society and Technology – IST). It was followed by a report (Delvenne, Evers & Roskamp 2012) and several workshops, where we had the opportunity to present these findings and exchange about them. Finally, the case studies from all the PTA organizations were compiled in a fully-fledged report and later distilled into several scientific articles (Ganzevles et al. 2014, van Est et al. 2015).

During later travels to consortium meetings and other PACITA activities, I again took the opportunity to conduct interviews. To better grasp current developments in PTA, I also voluntarily attended a workshop on cross-European TA as well as other meetings and debates, which were not formally attributed to us in the project. Furthermore, it is important to note that unlike bigger institutes that were dividing the work among several experts, I myself was involved in all different kinds of PACITA activities that SPIRAL was attributed (and beyond).

Besides PACITA, I also engaged with the broader TA community. For instance, I attended conference sessions about of TA (4S conference in Copenhagen 2012) or the annual conference of the German speaking TA network (NTA) in Bern 2012. All these successive and sometimes disconnected activities and encounters allowed me to get a sense of the current discussions and developments in the field of TA by being around and legitimate.

3.2.2. Moving in

The “moving in” part is largely covered by the action and mobilization activities foreseen in PACITA. It basically describes the process of becoming a part of the TA community. The description and research activities were already marked from our own organizational, cultural and scientific background at SPIRAL. These were occasions to make us accepted by pertinent and informed comments, questions and clarifications. During the PACITA activities we shared the vocabulary of “knowledge-based policy-making” (see below) rather than its evidence-based equivalent as some other partners did. We publicly intervened in favor of public participation (which was a particular normative commitment of the project). We became even more privileged interlocutors after successful mobilization processes such as organizing debates and summer schools.

Furthermore, the relative “far” advancement of the Walloon TA project carried by the Walloon government and the parliament (2009-2014) and substantially supported by SPIRAL, put us in a good position in the consortium and even in the wider TA community. One voluntary basis, we decided to organize TA working lunches with regional MPs²⁶, relying on the help and support of PACITA partners. These events were proudly advertised by our team and well received in the TA community (Rosskamp 2014; Charlier et al. 2015). Those developments in Wallonia, of which most were initiated by us, were the occasion to be invited for talks and presentations in TA arenas such as the Annual Conference of the German speaking TA network (NTA5 in Bern 2012), the 2nd European TA conference in Berlin 2014 or smaller and more informal presentations as for example in the Austrian Institute of Technology Assessment (ITA). I have also been “recruited” into the TA Portal²⁷ “eligibility board” because of my junior university researcher profile as the coordinator argued.

With my colleagues, I also took part in a series of training schemes such as the practitioner trainings in Portugal, Lithuania and the Czech Republic (Bütschi et al.

²⁶ The TA working lunches (or *midis de l'évaluation technologique* in french) were a series of sensitizing activities with Walloon MPs. Their aim was to make TA more concrete to them by applying a simulation of a TA approach to a range of topics they had previously decided on. A more detailed description can be found in the chapter on the Walloon Case Study.

²⁷ <http://technology-assessment.info/> (accessed 13th of April 2017). More information on the TA Portal will be presented below.

2015). I was additionally invited to help with the facilitation of the Ageing Society Scenario Workshop (see 4.2) in Vienna with a double goal to support the Austrian team and at the same time gain experiences and be able to brief our own facilitation team based on that practical experience. I even participated in a follow-up EPTA practitioner meeting after the end of the PACITA project. During these meetings we were considered as just any other PTA practitioners.

Lastly, we were called to actually perform real TA pilot projects towards the end of PACITA. This implied endorsing the role of a TA-like or TA-to-be institute for our respective region and addressing policy-makers and other innovation stakeholders and decision-makers with that knowledge.

3.2.3. Aggregation and presentation

For me the aggregation and presentation phase consisted in a double work. It is primary the work commissioned and foreseen by the PACITA project. The findings correspond to research data, interpretations, positions and conclusions I draw with my personal background of being a social scientist working in a University, in a non-PTA region that is involved in a project trying to foster PTA practices. This aggregated to joint reports and analyses, statements, comments in debates within the foreseen deliverables of the PACITA project.

Secondly, there were also the personal research goals about the institutionalization of TA. Here this work was relatively autonomous from the goals of PACITA but it has nonetheless built on the experiences, activities and insights gained within the project. The presentations of those personal analyses were made both inside and outside the PTA world. At times, my research findings could feed into some PACITA activities. I draw from data gathered during my fieldwork in Portugal in my concluding lecture at the PACITA Summer School in Cork, for instance. I also engaged in validation and feedback workshops for the descriptive parts of our foreign case studies with the actors from my fieldwork. For instance, I made presentations at the Technology Centre in the Czech Republic (24/09/2014) and held a joint workshop with the main PACITA project-manager in the Czech Republic in Liège (12/12/2014). I also presented our work in progress to an audience of the GrEAT network (16/05/2014) as well as at the Centre of Social Studies (CES) at the University of Coimbra (12/06/2014) in the presence of the main project-manager of PACITA in Portugal. On the theoretical level, we also tested our analytical framework with two prominent scholars who made crucial contributions to theorizing the network model of TA: A first workshop with G. Yoshizawa in Osaka University (19/12/2013) and a second workshop with A. Stirling in Liège (29/04/2016).

3.2.4. Moving out

Against the dangers of becoming native and the normative pitfalls it holds for a personal PhD research, I have at times more or less successfully managed to move out of the TA “world”. To be correct, it was rather (and continues to be) a back and forth between the TA “world” and the scientific community (i.e. social and political sciences and science and technology in society studies) and the many grey zones that overlap between them.

The very first but continuous extraction was the task to design a personal research proposal that would build on the PACITA project in an original way. These reflections comprised meta-considerations of the project goals as well as finding alternative approaches and non-exploited research opportunities within the project²⁸. The members of my PhD committee were not accountable to any of the PACITA partners and were very attentive that I put enough efforts into moments of moving out.

As a PhD student, I also have to give presentations to the scientific community and undertake scientific research stays. The host institutions in Portugal and the Czech Republic were part of my object of study as they are involved in the European TA community and their respective national TA scene. However, my activities (interviews and documentary research) made it quite clear that during my stay I was fully endorsing the role of a social science researcher. Especially with actors affiliated with the PACITA project (such as the GrEAT network) or official partner institutions (such as ITQB or the Technology Centre) my questions and positions clarified that I was working towards my own comprehensive research goals and less towards mobilization or advocacy.

Another major move out was my three-month research stay in 2013 at the IRIS (Instituto de Pesquisa em Riscos e Sustentabilidade) research center with the Universidade Federal de Santa Catarina, Brazil. Not only was the host institution in no means affiliated with the PACITA project but the scientific stay there also helped me to realize a certain Eurocentrism inherent to my research topic and eventually helped me to problematize some of the contingency and evolutionary assumptions around current TA developments.

²⁸ At this stage of moving out and producing scientific knowledge, it is important to note that most of the classic (scientific) readings about PTA have actually been written or at least co-authored by PTA directors or practitioners themselves (Vig & Paschen 1999; Hennen & Ladikas 2009, Joss & Bellucci 2002; Ganzvles et al. 2014). If much of the knowledge production is written from an insider perspective and even contains pleas for more TA (Hennen 2012, Klüver et al. 2016), some authors manage to get a quite reflexive and even sometime auto-critic perspectives on the TA practices. It maybe because they often hold hybrid positions between PTA affiliations and more traditional university or academy based research.

Finally, it was only after the end of the project that I had the necessary distance to start the very writing process of my thesis. A number of stakes ended and I did not need to worry too much about insertion any longer (except in the scenario of future TA project and collaborations). Hence, I could focus and work on further moving out – physically, normatively and conceptually.

3.3. A system of positions and changing roles

When it comes to the combination of research and participation in the studied processes, the anthropology classic of J. Favret-Saada (1977) *“Les mots, la mort, les sorts”* (Deadly words in English) is a good source of inspiration. Her ethnography of witchcraft in the French Bocage was a milestone in overcoming classical and distant anthropology and initiated a long lasting academic debate about the conditions and (im)possibility of being a “participant observer”. By trying to engage with her ethnographic fieldwork, she soon learned that speech had never the sole function of information and the quest of knowledge was always caught up in wider power relations. The exchanges with the “informants” were never just information exchanges but produced meaning and power²⁹. Hence, she found herself in a situation where there was no place for an outside, non-engaged observer when talking about her research topic. Instead she made a plea for the mapping of a system of occupied and assigned actors positions. Even if it preexists Robinson’s works, I take her approach as a helpful complexification of the “moves” of the insertion approach, which render the engagement with the studied community an additional heuristic value - giving access to knowledge and understanding otherwise inaccessible.

Against the anthropology ethos of the time, she chose to participate and to let her be “affected” by her fieldwork; to really experience what “witchcraft” means for the people dealing with it. She was taken in a game of successful and changing positions that she took and that were assigned to her. It was only through these different stakes she had in the Bocage’s witchcraft system that she could produce novel and comprehensive knowledge about this social reality. Let us have a look at the positions she identified. A first position is the non-believer, someone who is not “taken” and will ever remain an outsider to sorcery. Practically all folklorists and ethnologists who had previously tried to account for the sorcery phenomena in the distant role of administering questionnaires or interviews had been caught in this role. At the beginning, she was also trapped in this role and facing reactions like *“Not here, but in the neighboring village— they’re backwards....’ followed by a few skeptical anecdotes, ridiculing believers.”* (Favret-

²⁹ This links with the concept of “active interviewing” (Holstein & Gubrium 2006). The authors insist that the interview process is not a matter of extracting pre-existing opinions, positions and narratives but rather on the active process of co-constructing them with the interviewee.

Saada 2012: 438). Accepting the sorcery discourse and taking it seriously, only revealed her additional positions such as the annunciator, the victim, de-witcher – giving her access and the possibility to fully account for the witchcraft phenomenon.

Favret-Saada's additional point is that the positions are not solely the monopoly of single individuals. In the rural Bocage, witchcraft is a system and the roles of witch or victim also include the family members, the reproductive health, the property, the production means, the land and the animals.

Besides the attention Favret-Saada draws to the fact of being “taken” or “caught” (Favret-Saada 2012: 437) – (*pris*) or “affected” (*affecté*), she also mentions the necessity of “retaking” (*reprise*) (Favret-Saada 1977: 33) or relaxing in order to be able to describe and theorize.

3.3.1. Probing different roles and how they relate to each other.

As part of a series of self-reflexive moves, I have applied this kind of anthropology to my own engagement with the fieldwork and more particularly within the PACITA fieldwork. It is through the different phases of insertion and its respective moves that a system of places with insider and outsider positions, believers and non-believers, learners and tutors can be apprehended. I was similarly “caught” in different positions as well as affected by emotions, personal relationships up to friendships and shared normative commitments. In a situation where classical participant-observation is not possible, the additional value of Favret-Saada's approach over insertion is the ability to account for the engagement with other actors and assigned roles and involuntary moves that the researcher (and the collective he belongs to) cannot always deliberately control. Indeed, not all positions are equally accessible to anyone and some can only be described by contrast or in opposition to one's own place. The following paragraphs attempt to document and analytically account for the different positions and render this affection into something that makes the PACITA fieldwork additionally intelligible.

As in Favret-Saada's work, this “take” and game of positions did not only concern my own person but to some extent also my colleagues, the research center and university I was working for, the disciplines I refer to, the region and country I belong to³⁰.

³⁰ This was partially facilitated by the juxtaposition of a single partner organization on regional and national territories and the dichotomy between newcomers or non-PTA organizations and countries and PTA organizations and countries. See section 5.5 for more on this point.

3.3.2. The “good student”

At the beginning, I was very enthusiastic about the project, the concept of TA and European PTA institutions. I was going to work with internationally renowned institutions such as the Danish Board of Technology (DBT). The project would be opportunity to strengthen my expertise regarding public participation exercises. The impression of working together with “forerunner” and “innovators” was reinforced by the reading of P. Delvenne’s PhD thesis, which can give the impression that doing PTA and particularly participatory TA is associated with progress³¹ and increased reflexivity. Participatory TA is also presented as more democratic than technocratic approaches. According to the PACITA project plan, we were about to become enactors of progress by promoting PTA and public engagement in Science.

The project of course put Wallonia (a non-PTA region) and SPIRAL (a non-PTA partner organization responsible for Wallonia in the project) in a student position. We were about to learn from the more experienced partners. For me this situation was even more reinforced as I was indeed a PhD student and therefore on a rather low level of higher education compared to other partners that had PhDs, or were university professors or directors of research departments.

As we were already relatively familiar with TA, we soon managed to have quite interesting conversations with the PTA partners in the project. We were soon recognized as having pertinent insights and expertise and aligned with the normative goals of the project, i.e. committed to institutionalize PTA in Wallonia and in favor of public participation in Science and Technology issues.

Already during the first consortium meeting, P. Delvenne enthusiastically announced the intention of the Walloon government to install a PTA organization. It was followed by applause from the present consortium participants. From this time on, the different PTA partners in the project will repeatedly address our team with questions like “so what’s the situation in Wallonia?”; “How are things moving forward?”; They will also offer their help and support for activities and debates, often on a voluntary basis. In public events such as the organized parliamentary debates or the PACITA conference, the situation in Wallonia was often presented as a good example of a political project initiating the institutionalizing TA. Both the consortium and ourselves also partly attributed these advancements to the PACITA activities, endorsing the Walloon “success” as a way forward for expanding the TA landscape.

³¹ See also Laurent (2015) about the idea of economic, political, moral and scientific process in European Science Policy.

3.3.3. The “promoter”

During one of the first “moving out” exercises at a spring school in Vienna about Research and Innovation Policies, I was asked by one of the organizers: “But, do you believe in TA?”. This question and my difficulties answering with a “yes but...” made it clear to me that my research project was at this time still permeated by the normative goals of the PACITA project. In Robinson’s terms I had considerably “moved in” and felt like I had turned out to be a TA entrepreneur without having actually thought about it in that way. I would have to face similar questions later in interviews, informal conversations or scientific presentations during my national case studies. This has partly to do with the good student role described above that was assigned and endorsed by the ensemble “Me/SPIRAL/ULg/Wallonia”. All those comments and reactions testified that my interlocutors perceived me as being invested and advocating PTA and especially its participatory forms.

This was certainly true in activities such as the summer school or the mobilization activities aiming at expanding the TA landscape. In Wallonia, P. Delvenne and myself accepted to “get our hands on research action”. We made voluntary presentations to the science policy council (CPS) and tried to show what could be interesting in TA for several actors in the innovation process: policy-makers of course but also researchers, ministries, industrialists, trade-unionists, environmentalists, consumer organizations and so on. We offered our help for the writing of the Walloon decree proposal for the installment of a TA Unit in the Walloon Parliament. During the TA working lunches (see chapter 3) we tried to demonstrate and convince the audience of the possible added value and benefits of a TA approach. We further emphasized the participatory approaches by doing so.

These were the actions we were willing to endorse in this promoter role. Other facets of this role were also attributed to us. For instance, during interviews in Portugal and the Czech Republic some interviewees (even from the partner organization) thought we were actually a PTA organization. We were also perceived as experienced and “aware” of participation issues. On top of that, we were seen as close to the PTA organizations (“you agree with the coordinator all the time”). Furthermore, some actors came to me to ask for advice regarding their own national strategies of promoting PTA. I was submitted project proposals, workshop programs and discussed strategies of addressing and mobilizing people and expertise.

3.3.4. The “outsider”, the “intruder” or the “traitor”

I will mainly report this role through a number of “incidents”³² and anecdotes that revealed that at times myself and our team could be perceived as outsiders, maybe intruders, possible traitors pursuing a double agenda.

During the first PACITA consortium meeting there was a debate on whether or not to include someone from the STS field in the Advisory Panel. The debate revealed that the place of STS in this TA community was not taken for granted and potentially problematic. This consortium meeting was also the time when my position as a PhD student was explicated and demanded to be added in the consortium agreement. This request and my correlated presence seemed suspicious. People were wondering what I was exactly doing there? I was there with a double role. Soon I was confronted with first questions about my research. These questions were not only manifestations of interest for my research. I experienced some of them as real trials where my interlocutors were testing my knowledge of TA and attitude towards it, sometimes questioning the relevance of my preliminary findings.

At times it became clear that we at SPIRAL were also following our own research interests. After a couple of months (in July 2011), one of the main project leaders for the ITAS team in the consortium wrote an e-mail to my colleague with a copy to some of the project partners (actually all partners of the ETAG consortium³³ from Rathenau, DBT, FCRI, TC ASCR, ITA OeAW, IST and Fraunhofer ISI). He announced that he had just read Pierre and colleagues’ article recently published in *Technology in Society* (2011). He expressed his consternation before the analysis and conclusions regarding the relationship between the Scientific and Technological Option Assessment (STOA) at the European Parliament and the European Technology Assessment Group (ETAG) consortium. The original passage of contention reads as follows:

“The way studies are operated [at STOA] renders (so far) utopian the further developments of an integrated European approach to Technology Assessment. Indeed, there is a commissioned network of scientific institutes, the European Technology Assessment Group (ETAG), which carries out TA studies on behalf of the STOA panel. But this is certainly not a laboratory for developing TA practice and social learning. Usually, one of the partner organizations will be in charge of organizing the report with little input from the other organizations.” (Delvenne et al. 2011: 40).

³² See Thoreau and Despret (2014) about more voluntarily use of “diplomatic incidents” as a particular method of social science inquiry and way to trigger scientist’s reflexivity.

³³ The European Technology Assessment Group (ETAG) is a consortium of scientific institutes from different European countries and lead by the German Institute of Technology Assessment and Systems Analysis in Karlsruhe (ITAS-KIT). It carries out TA studies for the Scientific and Technology Options Assessment (STOA) at the European Parliament. See also <http://www.itas.kit.edu/english/etag.php> (accessed 13th of April 2017).

Besides the accusation of having been too close to the STOA secretariat through an internship and a refutation of the argument, this little friction mainly had an effect to show the consortium that we, STS-researchers at SPIRAL are not just working **with** TA partners in PACITA but also researching and writing **about** them. However, relations soon calmed down and P. Delvenne was invited to present his research at ITAS, where it was well received. Our team later published an article in a special issue edited by the German PACITA team (Delvenne et al. 2015).

Consequences of this episode were varied. We were very welcome to interview the director and a senior project manager at the NBT. They even encouraged us at the end of the interview not to be afraid of writing something critical about them. It was not always that easy. During the task of describing existing PTA practices, SPIRAL was assigned to describe the Flemish IST, we felt this ambiguity of having two roles. The Director of IST reacted sensitively to some questions we were asking about the neutrality and apparent political proximity of the institute with some political parties more than others. As it often happens in conducting semi-structured interviews, we were going a bit off the established interview grid that he had received earlier. Hence, he asked whether these questions were part of the documenting task. We answered we were also interested in those questions for our own research interests. The director of the DBT even declined our demand to write an article with him about the closure of DBT end of 2012. At first he was worried that this may come too early. While some arrangements with Danish policy-makers were still ongoing he did not want to jeopardize the chances of formally reconnecting with the parliament or other official policy-making bodies. But he also expressed his concern that STS researchers would possibly not be able to reflect on the whole complexity of the deinstitutionalization. These experiences reflect a certain critique towards STS or even scientific research and analysis in general as compared to practical knowledge in dealing with policy-making issues.

Finally, the other partners could possibly endorse or be assigned roles such as “the experienced” or even “forerunners” (the PTA partners, especially those accustomed to participatory methods) or “the disengaged” or “skeptical” (at times some of the non-PTA partners). However, such roles were not available to us neither to be endorsed nor attributed.

The systems of roles and positions described here hints at an evolutionary understanding of TA's development and a deficit understanding departing countries and partners that have/have not TA and are experience or not in that respect. This comforts the argument put forward in the previous chapter and will be further developed in the subsequent section.

4. Description of the PACITA Project

4.1. Origins and framing of the project

The PACITA project's acronym stands for "Parliaments and Civil Society in Technology Assessment". It was a European Seventh Framework Programme (FP7) project funded as a Coordination and Support Action (CSA) and Mobilization and Mutual Learning Action Plan (MMLAP) call of the Science in Society (SiS – 2010-1) directorate at the European Commission. Coordinator was the Danish Board of Technology. It was granted a budget of 4,4 million Euro including over 400 Person-Month over the period of four years. It ran from April 2011 to March 2015 and originally gathered 15 partners from 14 European countries (including Switzerland and Norway – Belgium was initially represented through two regional organizations).

In order to fully understand the rationale of the project, one needs to consider a series of relevant actors that initiated, tailored and enacted the projects. This section will retrospectively exanimate the scoping and tailoring of the project between the "enabler", which is the European Commission and more particularly the Science in Society directorate as well as the expert group that advises and monitors these activities and the "enactor": the project consortium. Such an approach avoids a rather instrumental and opportunistic reading of the funding opportunities that FP7 offers. Instead it seeks to grasp the intertwinement of the SiS directorate and the consortium led by European PTA organizations in the definition and pursuit of common goals and values. The enabler, the European Commission emits a call that acts as catalyst and the project consortium enacts it via the project proposal and its realization.

Two dimensions characterize the project. Firstly, it acts as a boundary object between the different actors involved (enabler, enactors but also the different partners in the consortiums and other actors that get mobilized through the project's activities) and secondly, it presents an experimental character typical for the European science policy.

At first, the PACITA project can be considered as a boundary object. *"Boundary objects are objects which are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. They may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is key in developing and maintaining coherence across intersecting social worlds."* (Star and Griesemer 1989: 303).

Within PACITA, the different partners and types of organizations collaborate and coordinate on a common task, which is characterized by an important degree of “interpretative flexibility” (Pinch & Bijker 1984). The latter means that different actors can see different, sometimes divergent, significations in it (Latzko-Toth & Millerand, 2015). Following an approach derived from the concept of boundary object allows to grasp not only objectives “foreseen” by the entrepreneurs but also the multiple translations and meanings that are operated by all the actors involved in the project (Latzko-Toth & Millerand, 2015). The case study chapters will go into detail of how the project and the taxonomies it uses and generates operate as “boundary objects” in concrete national and regional settings. It will show how the interpretative flexibility is played out and the official project goals find themselves in synergies (or not) with the ambitions of the national project partners. Moreover, the concept also captures how common ways of categorizing and understanding TA (taxonomies, neutrality) are both accepted and transformed in their take up.

At second, we follow Laurent (2015), who suggests to grasp European science policies as experiments and open-ended forms of governance, the PACITA project and the opportunities it aims at opening up in various European polities will similarly be taken as an “experiment”. *“Talking about “experiment” as a way of problematizing technological development in Europe echoes a series of works analyzing European policies as examples of “experimental governance” (Szyzsczak, 2006) or “democratic experimentalism” (Dorf and Sabel, 1998; Eberlein and Kerver, 2004). These works point to the use of non-legally binding coordination devices (such as the Open Method of Coordination) through which general regulatory choices can be adapted to local particularities, at the level of individuals, companies or member states. They make experimentalism a form of policy-making, ensuring a higher level of democratic legitimacy and efficiency.”* (Laurent 2015 :10). This experimental character associated with the interpretative flexibility will be particularly striking through the open-endedness and flexibility of some tasks and the inclusiveness of actors and practices under the banner of TA.

Science in Society (SiS) is an Action Plan of the Directorate-General for Research and innovation. SiS emerged as a *“dedicated arena for studying and practicing interactions between science and society”* (Mejlgaard & Bloch 2012: 696) as a standalone initiative in the Framework Programme’s funding architecture. It succeeded to the “Science and Society” Action Plan under FP6, which objective was to foster connection between science and European citizens. Under FP7³⁴, the Action Plan was relabeled “Science in Society”, putting more emphasis on public engagement and *“a sustained two-way*

³⁴ Under Horizon 2020, it has become “Science with and for Society”, where the concept of Responsible Research and Innovation become prominent in an aim of “reconciling the aspirations and ambitions of European citizens and other Research and Innovation actors” (European Commission, see footnote below).

dialogue between science and civil society" (European Commission³⁵). Thus it *"signaled a growing awareness that scientific knowledge production is a social activity, and a recognition of the complexity and subtleness of science's role and responsibilities towards other social systems."* (Mejlgaard & Bloch 2012: 696). The SiS discourse, and more generally the practices of public participation in science, technology and innovation, needs to be understood within a broader spectrum of European and global evolutions and convergences. Bonneuil and Joly (2014) describe recent participation initiatives as governance techniques inscribed in the discourse of the Knowledge-Based Economy. In a context that presents technological changes as solution to competitiveness, multiple crises (economic, social, environmental) and resource scarcity, public participation is invested with a mission to restore faith and trust both in scientific and technological process as well as in the institutions involved in these developments. (Wynne in Bonneuil & Joly 2014: 90)

Generally speaking, a "Mobilization and Mutual Learning Action Plan" (MMLAP) is not merely a research project. The call specified that in order to have a wide impact, proposals should include a minimum of 10 distinct partners organizations in 10 different EU or associated countries³⁶. Special attention should also be given to so-called *"newcomers in dealing with Science in Society Issues, as well as civil society organizations"* (EC 2009: 7). Additionally, the consortia *"should include several types of actors from different disciplines and experience"*, at least three different types of organizations such as *"science academies, research institutions, national or regional ministries, national and regional parliamentary offices of sciences and technology, research funding agencies, cities and local/regional authorities, civil society organizations, museums, science centers and science festivals, media organizations etc."* (EC 2009: 6-7). Furthermore, it stresses the importance of *"transnational exchange of best practice and mutual learning between the actors"*, the possibilities to make those cooperations last and their findings widely available (EC 2009: 7).

The concrete MMLAP call (SiS – 2010-1.0-1) expected to *"promote an open, effective and democratic European Knowledge society"* (EC 2009: 8). It indicated possible activity areas such as: *"[1] public engagement in research (PER) (involvement of citizens and their organizations) ; [2] ethics in sciences (including social and economic sciences) ; [3] gender perception and stereotype in science and technology ; [4] young people's participation in sciences and attitude towards science ; [5] two-way communication between scientists and other stakeholders ; [6] evidence-based policy-making / policy-making based on or using science and research"* (EC 2009: 7). Lastly, the call also encourages looking into the

³⁵ <http://ec.europa.eu/research/swafs/index.cfm?pg=about> (last consulted the 29th of June 2015).

³⁶ Associated countries in FP7 can be found under : ftp://ftp.cordis.europa.eu/pub/fp7/docs/third_country_agreements_en.pdf (accessed 29th of June 2015)

“barriers to the participation of civil society and its organizations in research and of possible means to overcome them” (EC 2009: 8).

The SiS and predecessor activities are also monitored and reflected upon by the MASIS expert group (Monitoring Activities in Science in Society). The latter was commissioned *“to look at the trends, the challenges and the cross-cutting issues related to the role of science in society”* and whether it is *“possible to talk about a European model for the role of science in society”* (MASIS 2009: 6). The 2009 report *“Challenging Futures of Science in Society – Emerging trends and cutting-edge issues”* will pave the way for the PACITA project and as it will be mobilized at several occasions in the project proposal as well as during the course of the project. Indeed, among the highlighted SiS activities and elements of a European model of SiS, the authors notably highlight the practice of Technology Assessment and public engagement in Science (PES) on several occasions. Moreover, they³⁷ identify a *“renaissance of technology assessment (TA)”* and an *“increased interest in technology assessment in the growing Asian economies, and renewed interest in the United States”* (MASIS 2009: 35). It is further stressed that *“seen from an EU perspective there should be interest in supporting New Member States by systematically exploring the possibilities for PTA in those countries, with their specific needs, political and cultural traditions relevant to TA, available science and research potentials, etc.”* (MASIS 2009: 67). Furthermore, the MASIS report mentions the Nordic countries as more *“willing to use consensus conferences and many other forms of public involvement in science policy debate (Mejlgaard 2009 Mejlgaard and Staes 2009), while others have been more hesitant or resistant.”* (MASIS 2009: 68). Public engagement as a recurrent concern also plays an important role in the view of these authors. Even though citizens’ involvement in science-in-society, it may not be a widespread conviction in the EU, they assume that it *“may become a component of a European model, and reinforce the quest for a European political and cultural identity”* (MASIS 2009: 65).

4.2. The PACITA proposal

On the enactor side, the consortium and project proposal was initiated by a small group of TA organizations and their directors. The idea matured in informal exchanges of directors of European TA organizations notably in and around meetings of the European Parliamentary Technology Assessment Network (EPTA). There has always been an extensive exchange between the TA community (notably represented through EPTA), the SiS Directorates at the European Commission as well as the experts commissioned to monitor the SiS initiatives (MASIS) and draft the calls. Often, names of prominent politicians such as Philippe Busquin (Former EU Commissioner for Research as well as

³⁷ Among the authors are renowned TA authors and advocates such as Arie Rip or Armin Grunwald.

Director of STOA - the TA Unit of the European Parliament) and Ulla Burchardt (Former Member of the German Bundestag and head of Parliamentary Commission for Education, Research and Technology Assessment) are mentioned when the origins of the project are narrated. It can reasonably be assumed that some prominent personalities like these two proactively lobbied the European Commission and particularly the SiS directorate in order to tailor the call to fit with the concerns of particular TA actors. Bonneuil and Joly (2013: 84-85) point out that the “Science and Society” (S&S, the processor programme of Science in Society - SiS) and the European Parliamentary Technology Assessment Network (EPTA) are the two major institutions have put efforts in discussing public participation in Science, Technology and Innovation issues in Europe.

The official objectives of the PACITA project are formulated as follows: *“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). Such practices involve a range of methods of cross-disciplinary expert studies, stakeholder involvement, citizen consultation and parliamentary discourse”* (PACITA Part B: 3).

For the purpose of the project, Parliamentary Technology Assessment (PTA) is defined as: *“[It] supports the process of democratic policy-making on issues involving science, technology and innovation, by providing comprehensive insight into knowledge on opportunities and consequences, by facilitating democratic processes of debate and clarification, and by formulating policy options. The practices of PTA across Europe reflect great diversity with regard to institutionalization, methodology and its broader societal role.”* (PACITA Part B, p.3).

Five elements are constitutive of the project and are here briefly summarized³⁸. Figure 7 will show how they relate to each other.

1. “Documenting TA” is concerned with providing the most recent account of PTA practices (Ganzevles et al. 2014) and possibilities of cross-European collaboration (Peissl & Barland 2015).
2. “Training TA” has a triple objective. Firstly, it aims at creating capacity and strengthening the practice base for TA by organizing practitioner trainings (Bütschi et al. 2015). Secondly, summer schools are concerned with raising awareness of users and target groups of PTA (scientists, stakeholders, administration and policy-makers) with the aim to facilitate the mobilization of PTA functions in their home countries (Delvenne

³⁸ More extensive descriptions can be found on the PACITA website www.pacitaproject.eu (accessed 29th of June 2015). We will go more in the details of particular activities in the national case studies when relevant for the analysis.

et al. 2015). Thirdly, this training material as well as other resources for TA practitioners and users should be made available an online “TA Portal” (Nentwich 2016).

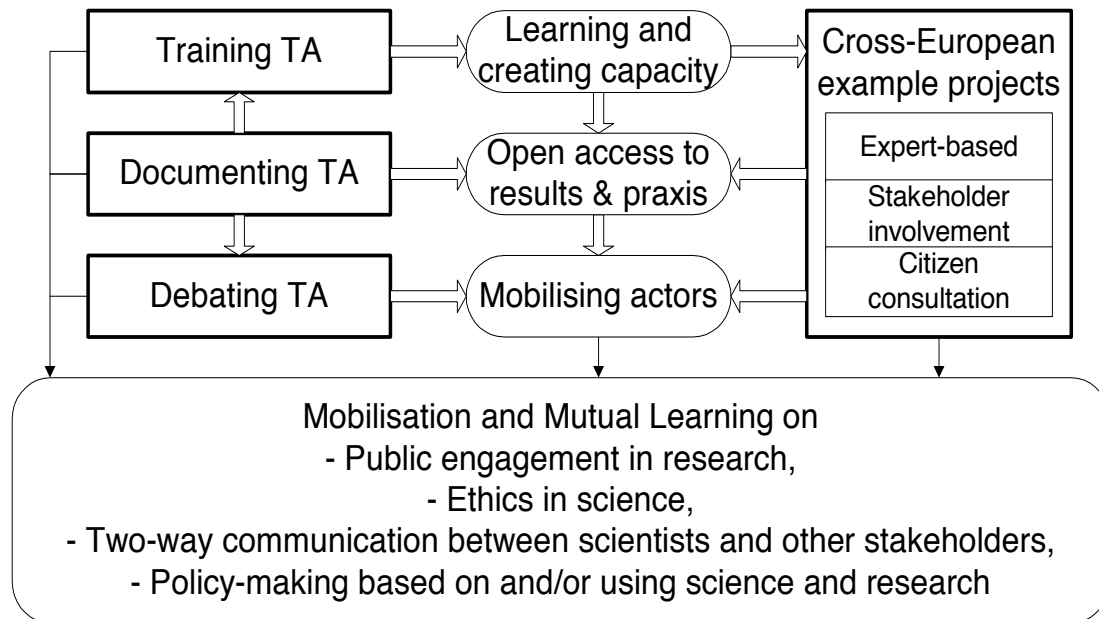
3. In “Debating TA”, so-called non-PTA countries and regions (i.e. political entities that do not have formalized structures of Parliamentary Technology Assessment) are scrutinized for barriers and opportunities for installing PTA functions (Hennen and Nierling 2014). The work package additionally comprises two national workshops in every non-PTA country, two parliamentary debates (Bütschi 2012; Bütschi 2014), two European TA conferences (Nierling et al. 2013; Borrmann et al. 2015) and a magazine on science and technology in society in Europe called “volTA”³⁹.

4. Three cross-European example projects⁴⁰ are carried out according to the three major types of actor-involvement in Technology Assessment. These concrete pilot projects address a selection of Grand Challenges identified in the Lund Declaration (2009) under the Swedish EU presidency⁴¹. (1) A future panel bringing together experts and parliamentarians on the issue of public health genomics was designed to live up to the goal of improving and further developing the “European capacity on evidence-based policy-making and policy-making based on or using science and research” (PACITA Part B: 7). (2) A series of Stakeholders-based scenario workshops on the Ageing Society and the role of Telecare was intended to include “*two-way communication between scientists and other stakeholders*” (PACITA Part B: 7). (3) A citizens’ consultation (World Wide Views methodology) on sustainable consumption was carried out and additionally built new capacities for “public engagement in science”. Both issues of public health genomics and ageing society additionally addressed the “ethics in science” concern.

³⁹ <http://volta.pacitaproject.eu/> (last accessed 25th of April 2017)

⁴⁰ If not otherwise specified we will indiscriminately refer to them as either “example projects” or “pilot projects”.

⁴¹ Those are expected to “*turn into sustainable solutions in areas such as global warming, tightening supplies of energy, water and food, ageing societies, public health, pandemics and security.*” (Lund Declaration 2009).



The PACITA MML Action Plan

Figure 7: The overall structure of the PACITA project. Source: PACITA Action Plan Part B

The project leaders present the PACITA objectives as converging with the SiS rationale as they “help mobilizing actors in Europe around the purpose of setting up and/or expanding the reach and capacity of PTA institutions/functions. This is done in order to establish PTA as a **stronger and more widespread carrier of the [...] Science-in-Society objectives.**” (PACITA Part B: 7 – our emphasis).

Following the recommendations of the MASIS report the consortium looks particularly at the “newcomer countries” in Central- and Eastern and Southern Europe. In order to overcome the barriers of civil society participation in science and science policy, the project entrepreneurs stressed that “working TA structures still have to be established in order to foster the interaction between science and society and to induce scientific knowledge as well as public demands and interests in processes of S&T policy making. Expanding the TA landscape is the major challenge for European TA in the coming years (MASIS 2009)” (PACITA Part B: 13).

4.3. Partner organizations

The consortium included a certain diversity of PTA institutions and an even larger sample of non-PTA organizations. So diverse are also the disciplines (engineering, philosophy, biology, sociology, agronomy and political sciences just to name a few) and professional experiences involved ranging from research to policy advice and advocacy, from communication and management activities. Out of the initial 15 partners of the consortium, 7 were PTA organizations and 8 were non-PTA organizations. The PTA

organizations belonging to the PACITA consortium (see annexes) were all members of the European Parliamentary Technology Assessment network (EPTA).

According to the project plan, the *“PTA partners should represent the different TA traditions and institutionalizations to cover the diversity across Europe”* (PACITA Part B: 74). The project referred to the taxonomy of three types of PTA institutes established by Hennen and Ladikas (2009). At a closer look, there was a slight overrepresentation of the interactive model (five⁴² out of 7 PTA partners). Furthermore, the office models were represented by their institutional members (FCRI for CAPCIT in Catalonia, see below) or the scientific (and thus more “independent”) institute operating the respective office (ITAS for TAB). This representation created a discrepancy between the “country” model and the actual organization representing the country in the consortium. The project proposal aimed to counterbalance this situation by the inclusion of committee models in the Associate Partner Group.

The SiS concept of “newcomers” was translated into the inclusion of 8 so-called “non-PTA partners”, which further reflect the diversity of organizations that the SiS calls seek. There are NGOs, science academies and affiliated institutes, research institutions and universities which involved a great deal of different profiles, qualifications, professional experiences and interest in participating in such project (see their description in the annexes). Some partners were quite new to the area of TA; others already have previous experience, notably in collaboration in former European projects with some of the PTA partners. These institutions were further selected for being in a position to trigger national/regional debates about *“knowledge-based decision-making and TA/PTA [...]”*. They had *“committed themselves to make use of their status in the quest for clarification about the role of PTA in their home countries/regions”* (PACITA Part B: 75). Moreover, they were presented as possibly evolving into PTA institutions or acting as *“birth helpers”* (PACITA Part B: 75).

The mutual learning objectives would notably be realized through the “pairing” of the PTA and non-PTA partners for a series of activities throughout the project. Thus nearly all tasks in the project bring together experienced and “less experienced” partners with regard to TA practices. The “experienced” PTA partners assure the leadership of the three example projects. But important tasks in the process were also given to the non-PTA partners in order to foster learning processes. The research and mobilization activities were also concerned by this pairing scheme. Firstly, in order to describe the existing PTA practices from an outside perspective, which was expected to initiate new insights and trigger self-reflection and learning among the PTA organizations. Secondly, for the non-PTA country studies a common research protocol was established by ITAS and assigned PTA practitioners assisted their non-PTA counterparts in interviews,

⁴² Respectively the DBT, NBT, Rathenau, IST and TA-Swiss are considered “interactive” models.

workshops and drafting of the reports. Training activities such as practitioner trainings and summer schools as well as the first project conference were deliberately organized in so-called non-PTA countries. The example projects were led by partners with previous experience with the topic (ageing society and telecare) and/or the methodology employed (World Wide Views). The non-PTA partners were associated to learn by doing.

5. The normative intervention goals of PACITA

Through various mechanisms in the course of PACITA, additional and more explicit normative dimensions came to the forefront and further framed the normative understanding of the project's goals.

At first, the project builds on a critique of “evidence-based policy-making”. Instead it proposes the notion of “knowledge-based policy-making”. Secondly, it tends to promote a particular form of Technology Assessment. As knowledge-based policy-making includes a wide range of civil society actors and citizens, it favors participatory approaches. This advocacy of participatory Technology Assessment, often presented as more evolved in the literature (see previous chapter) and the project references⁴³, is reinforced through the fact that the “interactive model” (Hennen & Ladikas 2009) is over-represented by the PTA consortium partners. Thirdly, our observations suggest that most of the project's activities to some extent converge around the objectives of “expanding the TA landscape”. Fourthly, erecting the expansion of the TA landscape as the flagship of the project reinforced the dichotomy between PTA and non-PTA partners. Even if this dichotomy got attenuated throughout the project, it still conveyed a deficitary understanding of some participant countries and their representative organizations in the consortium. Fifthly, the one organization per country rule of the SiS call reinforced the idea that PTA should be hosted and performed by a single, specialized and dedicated, nationally rooted organization. Thus, many efforts were channeled towards debates on the actual best organization form for it to fit the particular non-PTA countries. Sixthly, resorbing the non-PTA deficit by promoting a certain kind of technology assessment (preferably participatory and carried out by a single, specially dedicated and national organization) occulted other types of practices and possible forms of institutionalization.

5.1. From evidence-based policy-making to knowledge-based policy-making

⁴³ <http://www.pacitaproject.eu/about/references/> (accessed 30th of March 2017)

PACITA challenges the importance and very notion of evidence- or science-based policy-making by introducing a concept that is not explicitly reflected in the SiS Call: “Knowledge-based policy-making”⁴⁴. This semantic shift is grounded in a failure narrative about the possibility to deliver evidence-based advice.

*“[Classical TA or the] ‘technocratic’ TA approach” [...] was based on the (at least implicit) assumption that TA could deliver solid scientific knowledge about future developments, thus giving definite advice to decision-making. The history of TA thus can be seen as a learning process on the limited possibilities of improving planning and programming in political decision-making through scientific knowledge and the need to involve science, society and policy making in a dialogue about socially sound ways of S&T development. **TA thus is as much about “evidence-based policy making” as it is about “public engagement in science and technology”** (PACITA Part B: 12 – emphasis added).*

The plea to overcome science-based policy-advice also gets reiterated on a normative basis towards the end of the project. In an interview subtitled “It’s not just the science” for the last issue of the PACITA magazine VolTA, the project coordinator stressed: “*with knowledge-based policy you take into account the knowledge, experience and values of other stakeholders. If you take that out of policy, you’re doing the wrong thing*” (Van Kasteren, 2015: 16).

5.2. Participatory Technology Assessment

Although the variety of co-existing PTA practices and institutions is permanently reiterated and new taxonomies are created to account for this diversity, the project nonetheless held a narrative of a certain evolution of those practices towards more participation. So it reads “*during the 1980s and 1990s in Europe the deliberation model gained importance [over the policy analysis model] and can **nowadays be regarded as being dominant in many European countries***” (PACITA Part B: 10 – emphasis added). This diagnosis was backed up with scientific theorization of the changing relationship between science and society, wherein PTA is called to play an important role. Those mobilized theories; such as “reflexive modernization” (Beck et al. 1994, Hennen 1999) or “Mode 2 Knowledge production” (Nowotny et al. 2001) all comprise the idea of a historic evolution or a certain pathway (Delvenne 2011). In that regard, some countries and their PTA practices are more or less evolved in this particular process. The deliberative model being regarded as more advanced and responding to the “shortcomings of a ‘technocratic’ TA approach” (PACITA Part B: 12). The “*consultation process towards the public, stakeholders, societal groups and citizens can be regarded as*

⁴⁴ One cannot help but notice a familiarity in terms with the European jargon such as the “Knowledge Society” or “Knowledge-based economy”. This vocabulary choice thus potentially contributes to construct the European Identity around the crucial element of knowledge.

the European ‘improvement’ on the classical TA model” (PACITA Part B: 11 – emphasis added). The interactive model, which is overrepresented among the PTA partners, additionally tends to predominantly use participatory methods because of its additional mandate to foster public debate (cf. Hennen & Ladikas 2009).

Likewise, the participation objective was concretely pursued through the example projects. Although one out of the three in total used the future panel methodology, which is more expert and policy oriented, two cross-European pilot projects were considered “participatory”, i.e. using methods of stakeholder engagement in scenario workshop or convey citizens to deliberate and vote in the Europe Wide Views (EWViews) methodology. In addition to the outcomes and possible political impacts of these example projects, they are equally designed to build capacity and train the newcomers to such methods. The policy report of this process also emphasizes this dimension: *“The EWViews citizen consultation involved countries with a long tradition of citizen participation as well as countries with little or no experience in this field. In other words, through practice, countries with little experience with citizen participation processes learned from countries with extensive experience. Thus, the consultation aimed at contributing to the institutionalization of such processes Europe-wide.”* (Jorgensen & Juul 2015: 10).

The practitioner training seminars as part of the ‘training TA’ work package also focused expensively on participative and communicative methods (following the emphasis of Bütschi et al. (2004) definition of TA as scientific, interactive and communicative practice. Out of four practitioner trainings, three of the meetings were allocated respectively to the questions of “methods” (Sofia, April 2013); “involving actors in Technology Assessment” (Vilnius, November 2013); and “communication and impact strategies” (Prague, September 2014).

5.3. Expanding the TA landscape as flagship of the project

At the first sight, some of the official goals of the project stayed quite abstract. From within the project it soon became quite clear that if one had to summarize the PACITA project, the spontaneous description by the project partners would sound like: “Further institutionalize Technology Assessment in new countries” or “Expand the TA landscape”. “Expanding the TA landscape” was initially a concise task comprising of research and engagement activities in the non-PTA countries/regions about the prospects and obstacles to establish TA functions and/or infrastructures. After a series of standardized steps (interviews, reports, national workshops) it was left to the appreciation of the local partners as to what would be the next best steps to live up to the objective of “expanding the TA landscape”. It was negotiated with the European Commission’s project officer that this particular task would be “open-ended” and run until the end of the project. It would allow the non-PTA project partners to independently and flexibly

conduct additional activities that would strengthen the prospects for TA in their respective environment. Expanding the TA landscape thus became even more prominently the flagship of the project. In informal conversations, the project was occasionally referred to as “TA goes east”⁴⁵. Reference was made to the more recent EU countries in Central and Eastern Europe as the project proposal mentions “*‘white spots’ on the European TA map [and] while the European Union has been growing steadily the TA landscape did not do so during the last 10 years.*” (PACITA Part B: 13).

Iconic for the geographical expansion idea, the project partners have on several occasions displayed maps of Europe and even the whole world. In an early presentation the project coordinator showed a map of the world and indicated that it was a long-term goal to “bring” TA to rest of this map. During the conference in Berlin, another map was displayed in the plenary room. Conference participants could pin down little flags at their geographical origins and collectively construct a growing map of the TA community throughout the world.

5.4. A “deficitary” understanding

The idea of “newcomers” in the SiS call and the MASIS report got translated into a double deficit in the operationalization of the project. This deficit crystalized around the dichotomy PTA-partners and non-PTA partners. Another line of demarcation concerned the experience with participatory methods. Here again, based on former studies (MASIS 2009; Meilgaard et al. 2012), whole countries and the representing institutions in the consortium were either described as experienced or nonexperienced. Thus countries were represented as “lacking” PTA organizations and participatory practices; the non-PTA partners as “missing” the competences in participatory practices.

This deficit description reached a particular striking illustration with the presentation of Czech researcher M. Potůček (2012). Potůček was invited as keynote speaker to the international comparative workshop “Expanding the TA landscape in Europe” organized under the PACITA project in Karlsruhe (ITAS). Commenting on the first version of the non-PTA country reports, he sketched out some common dimensions of barriers (insufficient qualification of decision-makers, level of political culture, state capture, inadequate system of management, inhibition of civic engagement) and opportunities (qualification of decision makers, prognostic and strategic studies, civic and professional engagement, communication skills, experience sharing) for the countries under scrutiny. In a comparison table he would attribute them positive “+” or negative “-” scores. The

⁴⁵ Strangely and despite the similarities in vocabulary and objectives it was never made reference to a former project called “TA East” coordinated by the EA – European Academy for Innovation and Technology Assessment Bad Neuenahr (Banse et al. 2000).

non-PTA countries were portrayed as meeting or not meeting the necessary conditions for the successful installment of Technology Assessment Organizations. Such an analysis presents the institutionalization of TA as a linear, almost natural process. As if, when all identified conditions are met, TA could successfully emerge. On this single linear progression (from a “minus” to a “plus”) some countries (the PTA countries) are more evolved than others (the non-PTA countries). Furthermore, such a representation also suggests that there is one single best way to institutionalize TA i.e. when all the identified dimensions are met. There was no way for alternative trajectories of institutionalization in Potůček’s presentation. Moreover, it doesn’t consider retroactive effects of a proactive TA installment of PTA on these framework conditions. The potential role and agency of “institutional entrepreneurs” is thus downplayed.

Given this deficit, the aim of the project then became to resorb this very absence by relying on and sharing the experience and tradition of the existing PTA partners. In other words, it was concerned with doing more of what PTA organizations already do. Representative of this idea was, at the very beginning of the project, when the director of the Norwegian Board of Technology referred to documentation of existing practices as a “cookbook” of TA. Metaphorically speaking, it would contain a list of recipes and procedures to apply in order to build a TA organization adapted to national peculiarities. Thus the results, interview grids for the description of existing PTA practices often served as a blueprint for the exploration activities in the non-PTA countries.

During the project the dichotomy gave way to an alternative, slightly attenuated deficit description of “emerging TA countries” and “TA-like activities”. Being less polarized, such an account continues to picture an evolutionary understanding as if all European countries could be placed on an axis (or two) and benchmarked with regards to their development of the TA practice⁴⁶. The idea that some countries have some “catching up” to do remains. This view echoes what the author of “epistemologies of the South” has called the “monoculture of linear time”, which “*produces non-existence by describing as backward whatever is asymmetrical vis-à-vis whatever is declared forward*” (de Souza Santos 2012: 52). In such a view it is difficult to grasp neither the existence of radically different realities nor the emergence of alternatives to what is considered advanced.

5.5. One organization – One country

The open-ended objective of “expanding the TA landscape” was often locally understood

⁴⁶ We find such conception for instance in the work of Jacob and Varonne (2004), where they compare the institutionalization and maturity of the evaluation of public policies in different European countries along the dimension of instances and rules, fora and practices.

and performed as to strive for the installation of new PTA units. In many consortium discussions and national efforts, the reflection was mainly concerned with the organizational forms and settings of TA for particular countries. This situation ultimately (and unintentionally) led to confusion between TA practices and PTA organizations. The phenomenon was reinforced through the one partner per country rule of the SiS funding scheme. This rule also echoed with the functioning of the EPTA network. Originally established to gather all European PTA institutes, countries are only represented through one organization (the one that is linked to the Parliament). Indeed, in the project existing TA practices⁴⁷ are represented through single national PTA organizations. Conversely, the non-PTA partners that had responsibility in the project for a whole country or region were furthermore presented either as organizations for a possible take-over of (P)TA activities or as organizations having a privilege access and a unique position to facilitate the exchange between knowledge sources and policy-making.

5.6. A particular understanding of TA

The combination and interplay of the normative elements mentioned above (knowledge-based policy-making, emphasis on participation, priority for the expansion the TA landscape, deficit description of non-PTA countries and organizations, juxtaposition of countries and organizations) participate in framing a particular understanding of Technology Assessment.

The dichotomist deficit (PTA/non-PTA, experienced/newcomers) inscribed in the PACITA action plan left little space for grey scales or different levels or degrees of institutionalization as well as alternative pathways for meeting the SiS objectives. The one country / one organization juxtaposition in the SiS framework (and in the EPTA network) closely associated the practice of TA with PTA organizations. This gave the impression that the praxis of TA can only be supported with the equivalent institution supporting it – preferably a single, specially dedicated, permanent and nationally-bound organization as are the PTA partners in the project. These single, national organizations were furthermore presented as prerequisites for trans- or cross-national TA exercises as *“European Integration of national TA activities is lacking institutional structure and continuity”* (PACITA Part B: 12).

At first, this situation does not reflect the whole landscape of TA. Besides the “interactive model”, “the office model” and the “committee model” continue to co-exist⁴⁸.

⁴⁷ The broad term TA, which can theoretically also comprise activities not targeted at parliamentarians, was often used as a synonym for the much more confined practice of PTA.

⁴⁸ Office models such as UK’s Parliamentary Office of Science and Technology (POST) or the Scientific and

Participation and deliberation activities do not replace the expert-based and policy-analysis practices of TA. Expert-based and policy-analysis TA continues to be developed and inspire some non-PTA countries. It can also be misleading to associate particular institutions with whole countries. In EPTA, the PTA organizations that are operated by (consortia of) scientific institutes (in Germany for instance) or where different tasks are outsourced (Flanders or Switzerland for example), the PTA member organizations do not necessarily represent the whole spectrum of national TA activities⁴⁹.

At second, by basing itself on “traditional players” of PTA, the project’s rationale neglects other theoretic or practical proposition for the evolution of the practice and organization of TA.

6. From institutional creations to multiple ways of expanding (and differentiating) the TA landscape

Let us now examine some of the concrete project enactments, especially the way the example projects were carried out and relate to how the project leadership takes stock of PACITA’s achievements towards the end of the project. We here highlight some discrepancies between the above-mentioned theoretical references and normative visions for TA and concrete enactments of the project. Also the way the example projects were conducted raised expectations with some of the national partner organization as to how to effectively promote TA in their country/region.

We have seen that the objective of “expanding the TA landscape” was largely left to the appreciation of local partners. It was also flexible enough to accommodate and reintegrate a broad range of other activities and outcomes of other work packages. As a matter of illustration, during the concluding session of the PACITA conference in Berlin in February 2015, the director of DBT Foundation and coordinator of the project presented the results of the project as follows⁵⁰. According to him, PACITA contributed to expand the TA landscape “*geographically*”, “*collaboratively*”, “*networkingly*”, “*conceptually*” and “*politically*”. The geographical expansion referred to developments in new countries in which “seeds were planted”. The collaborative or network extension

Technological Option Assessment at the European Parliament (STOA) as well as Committee models such as OPECST (*Office Parlementaire d’Évaluation des Choix Scientifiques et Technologiques* - Parliamentary Office for the Evaluation of Scientific and Technological Choices) in France could not take part in PACITA.

⁴⁹ On the non-PTA side, this is also true. Over time associate or observer members have changed for the representation of certain countries. This is for instance the case for the Czech Republic. SPIRAL also applied to become an associate member although it build up experiences in TA and TA-like practices, it does not intend to become a fully-fledged PTA organization - a process happening in parallel within the parliament.

⁵⁰ <https://slideslive.com/38893133/closing-session-and-farewell> (last accessed on November 19th 2016). Elements of this speech are also to be found in Nielsen & Klüver (2016).

meant the experience of working together and that “*we add something to Europe when we do it*”. He further insisted on the combination of being “*nationally rooted*” and simultaneously working on a supranational level: “*It’s important that TA is nationally rooted. That’s where we have our cultures, that’s where a lot of policy-making is going on. But it’s so important that we also have the other level.*” The conceptual broadening mainly refers to the aforementioned shift from Parliamentary Technology Assessment to policy-oriented TA. It is based on the experiences mainly from the Eastern-European project partners and the varying levels of actual political power national legislative assemblies are supposed to have. The political expansion refers to a larger support from Parliamentarians across Europe fostered by a series of meetings and workshops initiated by the project. Finally, capacity wise, the coordinator insisted on the mutual learning between what he called “*TAers and those who want to be TAers*” inducing new ways of thinking and performing TA for all involved partners.

What may seem paradoxical given the pervasive narrative of “doing more of the same”, the coordinator also stressed the increasing diversity the project was confronted with and contributed to document. He insisted on the different national cultures and gave the example of the relative separation of powers between government and parliament as a different reality throughout European countries. “*The next horizon is probably with more diversity that we see now [...] that’s not only good, I think that’s necessary. I think that’s what we learnt from our diversity and from our different practices and different thoughts, our different cultures. That makes us richer, all of us*”. This account shows how the aim of expanding the TA landscape was increasingly diversified, complexified and slightly moved away from the evolutionary and deficitary narrative from the beginning of the project. Indeed, “expanding the TA landscape” was initially understood as the very ambitious task of creating these single, national, specialized and dedicated TA organizations. It progressively shifted to a multitude of ways to enact and further uptake of TA (as we will see in the following chapters 3, 4 and 5). Nonetheless, it remains an ultimate and ideal goal as one can notice from the TA manifesto drafted at the end of the PACITA project and presented at the PACITA conference in Berlin in 2015. Therein, the coordinator states “*TA should be institutionalized in all European countries [...] The diversity in cultures and political contexts in Europe call for national implementation of TA in ways, which are optimal for the single nation*” (Klüver et al. 2016: 15). In pursuing this objective, the TA community has been very attentive to take into account these nation specific peculiarities in terms of institutional landscape, policy culture, R&D governance and so forth. On numerous occasions it was stressed that there was no best way to set up a TA organization and that each country/region had to find its own particular organizational arrangement that fits its context. Likewise, the main difficulties the local TA entrepreneurs encountered were mostly understood in these political/governance terms. Moreover, the difficulties faced in this endeavor were narrated as if they were mainly contextual or cyclical obstacles that could more or less easily be resolved in the

medium term. In such a framing, the definition of TA remains unchanged and the project of expanding it is not fundamentally compromised. Leaving the concrete issue of how to institutionally organize a TA capacity to the appreciation and debate of local actors echoes with the political subsidiarity principle that seeks to respect national or regional autonomy and specificities by taking decision at the lowest level of power possible (see discussion chapter 6).

Meanwhile, the vagueness of “expanding the TA landscape” also opened a new avenue for promoting TA. In the TA manifesto⁵¹ it reads as follows: *“TA can through strong knowledge sharing and collaboration contribute to knowledge exchange and synergies, which provide for widespread use of the independent and knowledge-based advice from TA. Countries should help each other by sharing TA knowledge and outcomes”* (Klüver et al. 2016: 15). Hennen et al. (2016) phrase the same idea in a similar fashion: *“To further promote TA, one viable pathway would be continued collaboration – for example, through starting TA projects together with experienced TA countries”* (Hennen et al. 2016: 38). In other words, in the evolving normative conception of the PACITA project, the institutional deficit gives way to a more practical approach concerned with project collaborations and exchanges of practices and knowledge. Doing so, the broad scope of “expanding the TA landscape” not only subordinated a series of other project activities (such as the TA portal or the example projects), it also increasingly based itself on these very activities to renew its ambition and come up with a different way of expanding the TA landscape. This shift of emphasis puts the project in a more favorable light given the difficulties of installing new TA organizations. Simultaneously, it also co-constructed expectations of knowledge sharing and possibilities of economies of scale and cost savings more generally within some project partners as we will see in the national/regional case studies.

This observation is particularly true for two major working sites of the project. First to be mentioned is the TA portal⁵² - an online repertoire for projects, publications and experts of the different member organizations (aiming beyond the PACITA consortium). It is supposed to continue its service and become self-running after the project. Ideally it should serve two functions. Firstly, it should become a tool for increased daily work and communication for international TA collaboration. *“Help TA practitioners to do what they have to do: stay up to date about the TA literature; to know whom to approach for specific expertise; to build on projects done by others; to stay informed about current activities of fellow TA units; to be aware of TA events; to stay tuned with current trends; and so on.”* (Nentwich 2016: 155). Secondly, beyond the community of sole TA practitioners, it should also address the political and public sphere with attractively presented TA information. In a (non-funded) follow-up project, this infrastructure was to be further

⁵¹ <http://www.pacitaproject.eu/ta-manifesto/> (accessed 19th of April 2017)

⁵² www.technology-assessment.info (accessed 19th of April 2017)

developed. The main drivers were notably the supposed of economies of scale, a larger participation in TA projects and a wider dissemination of results.

Secondly, the three pilot projects (future panel on public health genomics; scenario workshops on ageing society and telecare; European Wide Views on sustainable consumption) carried out within the PACITA framework were designed to experiment with transnational collaboration and ultimately gaging the feasibility for scaling up and generalizing some TA methodologies. Inevitably some trade-offs had to be made between local peculiarities and an overarching thematic and methodological framework. To roughly illustrate the point we will draw on our own involvement and observations made during two⁵³ of these projects (scenario workshop on ageing society and telecare ([Barland et al. 2016]), and the European Wide Views on sustainable consumption [Jorgensen et al. 2016]). Under the supervision of an experienced TA institution as task leaders, different partners collaborated in order to establish information materials and dilemmas to be addressed and questions for participants. The methods were relatively standardized - every partner was duly trained in order to carefully follow the same approach. With this top down design and the standardization of TA methods, the room for the expression and maintaining of differences was relatively defined and contained. During the preparation phase, inputs from the various collaborating partner countries had been aggregated along with inputs from the European policy sphere. Correspondingly, national and regional peculiarities had become absorbed into a problem framing, information material and questions that all partners deemed sufficiently generic to accommodate all sensibilities or allowed them be dealt with in an ad hoc manner. During the actual participatory events in the different places, local diversity was introduced as either modular or a facultative add-on⁵⁴. Concretely, in the introduction of the scenario workshop on the Ageing Society and telecare technologies, a series of presentation slides were foreseen to introduce the national/regional data before going back to the common problem framing, scenarios, technology description and methodology. In the European Wide Views on sustainable consumption, if they wished, local partners could include an additional deliberation session after the previous four common rounds (consisting of receiving information, deliberating at small tables and voting individually). The outputs of these collaborative projects address the national and the European levels simultaneously. National results reports were compiled in a general report for European policy making. Local partners had the opportunity to present those findings along with the more particular results stemming from their local performance of these participation exercises to relevant policy-makers

⁵³ The project plan did not foresee a participation of SPIRAL / Wallonia in the Future panel on public health genomics. However, we will also draw on lessons of this project later on by referring to Van Est et al. (2016). Additional information about the lesson of this particular pilot project can be found in Krom et al. (2016).

⁵⁴ For the Europe Wide Views, it was even possible for external organizations to join the citizen consultation when all the information and questions were already settled.

and addresses on the national/regional level.

In those exercises, the problem framing was jointly constructed but remained the same throughout all participating countries or regions. As often in such settings (Doganova & Laurent 2016), only the responses of the public (stakeholders or selected citizens) were supposed to vary, not so much the way the issue was problematized and presented to the participants. Subsequently, the role of the intermediary organizations carrying out these participatory exercises was the same across the different countries and relatively limited in terms of local adaptability⁵⁵. This analysis is consistent with more historical research into the development of participatory methodologies carried out by Voß and Amelung (2016), which point a phase of internationalization of participatory and deliberative practices, alongside efforts to standardize and decontextualize such practices. Moreover, those developments are accompanied by theoretical efforts to meet claims of scientificity such as replicability, representativity and universality. In the next chapters we will address how these developments are taken up in the national and regional case studies. Taken together, what these developments mean in terms of “expanding TA” and what understanding of knowledge and policy-making underlies these developments will be addressed below and in the discussion chapter.

7. Intermediate conclusion

The European PACITA project does not only constitute a starting point for the subsequent case studies on the national and regional level, it also allows to capture developments on the level of the international TA community, which are irreducible to a lower level of analysis.

Organizational wise, the project reinforces the idea of single, national and specialized TA organizations. This notably puts some partners and countries in a deficitary and catching up position. This observation is not only present in the written sources of the project but also reinforced by the affection and system of places revealed by our ethnographic approach.

Initially PACITA mirrors the main literature described in chapter 1. It notably presents participatory TA as a more advanced form of the practice. A series of alignments also reinforce this conception and the project also concretely aims at performing it via example projects. On paper, PACITA fully endorses both evolutions on the knowledge and policy-making axes described in the previous chapter. As we learn from our observations, the concrete enactments sometimes give a contrasting and more nuanced

⁵⁵ The methods of selection and recruitment of participants as well as more logistical aspects were left to the appreciation of the local organizers.

picture. At first, PACITA with its dedication to both strengthening national TA capacities and engaging in increased international cooperation reflects an understanding of multi-actor, multi-level governance. This is reflected in the diversity of cooperating partners and how the project tries to address issues simultaneously on the European and the national/regional level. The latter reflects a certain idea of the political subsidiarity principle of the European Union. Secondly, regarding the conception of knowledge, the term “knowledge-based policy-making” forged by the project’s initiators was clearly meant to endorse the post-positivistic understanding of knowledge. However, looking at some concrete enactments and outcomes of the projects as well as the interaction and feedback with the newcomers, some of these diagnoses need to be further specified or revisited towards the end of the project.

First, with the shift of “expanding the TA landscape” from a pure organizational deficit to rather a deficit of knowledge, the idea of having economies of scale and to centralize some of the knowledge production at a supra-state level gained prominence. The idea was further reinforced by the design of the pilot projects and the TA portal. This stays relatively in line with the multi-level, multi-actors understanding of governance. However, we can clearly identify a discrepancy between the project’s initial discourses and rationale of knowledge-based policy-making and the way the pilot projects were carried out and reconnected with more scientific claims and a rather linear and separatist relation between the framing, the participants’ input and the way the insights are supposed to feed into policy processes.

Second, we also need to account for readjustments stemming from the initially labelled non-PTA partners and countries. Replacing this qualification was not the only semantic and even conceptual shift that occurred during the project. One can additionally mention the shift from Parliamentary TA to Policy-oriented TA. Hennen and Nierling (2014) also take stock of a diversity of ways to bring TA forward, not only in the footsteps (or path dependency) of existing institutional trajectories (supporters of Parliament and institutional traditionalists, both understood as single, national and specialized organizations). They also come up with the category of “innovative explorer” which notably builds around the idea of networked organizational forms. Ganzevles & van Est (2012) also foresees new possible institutional forms that do not yet exist in their inclusive modelling approach.

The PACITA project also constituted a common ground to the following case studies in Wallonia, Portugal and the Czech Republic. As we have shown, lessons from the developments in the partaking countries contributed to reshape the objectives of the PACITA project and brought about new insights. Symmetrically, the PACITA project had also an impact on the national and regional polities it was enmeshed in and wherein TA was concretely remade. This will also need to be confronted with a series of alternative

models for TA mentioned in the previous chapter 1. Concretely, how those alternative trajectories and institutional models will interact with the initial framing of the project and the agenda of the PTA project entrepreneurs will be explored in the national/regional case studies of chapters 3-5.

CHAPTER 3 - Co-producing a regional, policy-oriented, participatory Technology Assessment in Wallonia

1. Introduction

The history and paths of Technology Assessment in Wallonia date back to the 1980s and have always been closely intertwined with the political evolutions of Belgian federalism as well as international evolutions to which the different regions tried to respond. After characterizing contextual elements such as STI regimes, political competences and identifying relevant actors, the chapter outlines different generations of institutionalization and past initiatives to anchor TA in Wallonia. Special attention will be given to the most recent attempts and actor constellations advocating a new attempt at institutionalization around the concept of a specially dedicated, participatory and policy-oriented Technology Assessment in a single regional organization, which culminated in a parliamentary decree proposal in 2014.

Following neo-institutional literature, the generations of institutionalization will be described by giving attention both to organizational and cognitive aspects. However, the developments show considerably more efforts put into organizational considerations than on building a community of practice. More concretely this chapter will map out actors and organization as well as their strategies and discourses towards TA, notably by using the inclusive modelling approach to outline the relationship between the societal spheres (parliament, government, science and technology and society) involved in the process. The latter reveals a current model of shared Parliament-Government-Science-Society involvement in TA. Elements of community of practice will also be scrutinized. In the chapter, we argue that each paradigm shift (of the rationale, methodology or institutionalization) of TA also co-produces a series of shifts in social order and in power relations between institutions and societal actors. Firstly, the current project breaks with a certain tradition of social concertation in public debate, as was the case with the former TA mission in Wallonia. Secondly, it reinforces the parliamentary institutions vis-à-vis the government in a series of symbolic but also pragmatic ways. Thirdly, it got progressively caught up in a regionalist political project.

Finally, in the face of a current standstill of the project, we also draw attention to less visible discourses and actor-constellations pointing at different institutionalization objectives and organizational forms for TA. Those are notably inspired by a network paradigm. We will outline some constitutive elements of what we perceive to be a potentially emerging 4th phase of Technology Assessment and look again into the kind of co-productions in terms of knowledge and social order it implies.

2. Methodology

The Walloon Case study stands out from the two others in Portugal and the Czech Republic for a number of reasons. As we have already elaborated in the previous chapter, we were involved in this very project as Walloon Partner. Hence, much of the data was gathered by means of engaging with a series of actors in the hybrid role of action researcher. The occasions we gathered data, were often situations in which we played the previously described role of promoter (see chapter 2).

This data is composed of other heterogeneous material: interviews made in the context of the PACITA project (see list of interviewees in annex), numerous notes, records and partial transcriptions of meetings, workshops, conferences, working lunches as well as written sources such as scientific articles, newspaper articles, grey literature, circulating legislative drafts and so forth.

With the help of the insertion methodology, we affirm to have more or less resisted to “moving in” too much or being positioned as in a service role. Accordingly, we arranged for sufficient time and space to “move out”. As mentioned in the previous chapter, this included critical discussion and different attempts at theorization (notably the political dimensions of TA in Wallonia) with my PhD committee, my colleagues and other peers. Besides a series of relatively descriptive conference contributions and publications, in the context of the Walloon Case study, one can mention a few more reflexive and theoretical productions: For instance, a presentation given at the Austrian Institute of Technology Assessment on the 27th of March 2014 entitled “TA lunches at the Parliament and the Walloon project of creating a TA organization – Implications in terms of co-production of social order and knowledge”. We also made similar previous presentations during our research stays in Portugal and the Czech Republic. Another example would be the co-authored and comparative article “De- and Re-Institutionalizing Technology Assessment in Contemporary Knowledge-Based Economies” (Delvenne et al. 2015).

3. Regional policy context⁵⁶

In order to contextualize the history of attempts to institutionalize TA in Wallonia and understand the recent efforts, there are several elements and peculiarities to take into account. The Belgian federalism and the derived split of competences (including STI-related matters) is a first element to consider. Secondly, the remains of the consociationalism and neocorporatist governance structures are still prevalent. Thirdly,

⁵⁶ Parts of this chapter are based on our previous collaborative work on TA in Wallonia in the framework of the PACITA project (Delvenne et al. 2012).

the evolutions of STI regime and its contextualization in a region marked by decades of economic decline are not negligible. Fourthly, one also needs to look at the tradition and experiences in public participation – especially in STI-related matters.

Belgium is a federal State with a high degree of decentralization and the political system is characterized by a strong neo-corporatist organization. It has long been a reference of the model of “consociational” democracy. Society was traditionally divided and structured along the lines of ideological “pillars” (catholic, liberal, socialist) in domains as encompassing as education, health services and insurances, labor unions, political parties, press and so forth (Lijphart 1977). Social partners (i.e. representatives of both employers and workers) are regularly consulted or associated to policymaking through numerous neo-corporatist organizations, particularly for issues related to economic and social policies.

Science, Technology and Innovation (STI) responsibilities are divided between the six sub-stated entities: basic research policy and university funding by the three Communities (Flemish-, French- and German-speaking); innovation and economic policies to the three Regions (Flemish, Walloon and Brussels-Capital), and some competences (such as nuclear and spatial research) are still in the hands of the federal authority, which continues to get dismantled.

First steps towards the regionalization of research, science, technology and innovation (STI) policies occurred in the 1980s. As a result, two distinct and very different STI regimes developed in Flanders and in Wallonia. In the Northern part of the country, the Region of Flanders merged in the Flemish Community – a single political entity. Consequently, this entity is in charge of all STI matters in Flanders. In the French-speaking parts, on the other hand, the Walloon Region, part of the Region of Brussels-Capital and the French-speaking Community⁵⁷ (which encompasses competences relation to French-speaking people in both the Brussels and the Walloon Region) continue to be distinct administrative and political entities.

The sub-state entities (Communities and Regions) all started different STI policy initiatives (Halleux et al. 2009) at their respective level of power. For example, in 2003, Flanders launched the Innovation Pact. In 2005, Wallonia launched the Marshall Plan (which in 2009 became the “Plan Marshall 2.Vert” [*Marshall Plan 2.Green*] and in 2015 Marshall Plan 4.0 in reference to the fourth [numerical] industrial revolution), while Brussels initiated a Regional Innovation Plan on its own side. In addition, there are

⁵⁷ We will alternatively make use of “Federation Wallonia-Brussels” and “French-speaking Community” in the present chapter. While more recently French-speaking and Walloon Policy-makers increasingly use the first term to stress approximation efforts between both entities, the second one remains the official denomination found in the Belgian constitution.

several more sectorial or specialized initiatives of innovation policy such as “creative Wallonia” or “digital Wallonia” aimed at reconverting the Walloon economy. One cannot really say that there is a single STI system in Belgium but rather several regimes based on various industrial networks, different sectorial concentration and specialization as well as a set of different public support schemes and linkages to industry.

Even though this chapter focuses on Walloon TA, we will be referring to both the Walloon Region⁵⁸ (in charge of the economy and applied research) and the French-speaking community (in charge of fundamental research and direct university funding), as both entities tend to complement and overlap with one another, notably in S&T matters. However, many actors involved in the STI governance consider that the R&D funding and support programs severely lack coordination. Wallonia today is in charge of the broadest part of competences related to research and science, technology and innovation. On the other hand, the French Community is severely underfinanced. Regularly, political debates emerge between Walloon Regionalists, supporters of the French Community and advocates of the region of Brussels-Capital for a reform and administrative simplification of this situation.

Despite the fragmentation of competences, policies and support programs, in addition to the associated lack of coordination, in recent years the Walloon science policy is said to have increasingly become streamlined and strategic, i.e. contextualized and oriented towards societal and economic relevance (Fallon & Delvenne 2009; Delvenne 2011; van Oudheusden et al. 2014). This is concretely observed, notably in the Competitiveness Poles and the successive “Marshall Plans” that put innovation at the forefront of the economic redeployment of the Region. More recently the Agencies for Technological Stimulation (AST), for Economic Stimulation (ASE) and the Numeric Agency (ADN) have merged under the banner of an encompassing Agency of Enterprise and innovation (AEI).

Additionally, there are consultative organs at all levels (science policy councils). In Wallonia, this role is played by the Council for Science Policy (CPS), which was created in 1990, within the Walloon Economic and Social Council (CESW, formerly CESRW⁵⁹). It gives policy and legal advice on any issue related to Walloon science policy. It is composed of social partners (employers’ and workers’ representatives), universities, industrial research centers and representatives of the Government). Recently the CPS began to expand its recommendations to matters relating to the French-speaking Community’s competences.

⁵⁸ In the section 6 about co-production, we will illustrate how the governmental project of setting up a TA organization was initially aimed at addressing both of these political territories and how and through which concomitant processes the project became increasingly tailored to the Region.

⁵⁹ <http://www.cesrw.be/index.php?page=EN> (last accessed 25th of April 2017).

Public participation in Wallonia is often quite unidirectional, from scientific experts to policymakers and/or society, with a generally low level of societal debate but intense exchanges between experts. In recent years some legal provisions have paved the way for codified forms public participation in environmental affairs and land planning. Regional and municipal legislation requires forms of public consultation in matters such as urban planning or environmental matters. This gives rise to local experimentations with participation. In addition, some public participation exercises have taken place in recent years, all at the federal level. During the last 10 years, Belgium has started to witness a modest rise of participatory events (and the associated capacity building within some organizations) such as Meeting of Minds in a European context (Claisse and Brunet 2013), the G1000 organized by civil society actors (Caluwaerts and Reuchamps 2015) and consensus conference (Parotte and Delvenne 2015) on high level nuclear waste by the national agency in charge (ONDRAF). Flanders has also developed its own forms of public participation in STI (Van Oudheusden et al. 2015). In addition, uninvited, protest-based participation (Bogner 2014a) surfaces from time to time on issues such as, for instance, animal wellbeing, urban and mobility planning or GM crops.

4. The History of TA in Wallonia and relevant actors⁶⁰

Walloon TA history is best understood as a succession of projects and temporary solutions throughout the last 30 years. There was only a very small formal institutionalization period from 1994 to 2002. However, scientific expertise in TA and connected areas has accumulated throughout the years. Framework conditions have started to change recently so as to potentially better accommodate a TA mandate in STI governance. The rationale and paradigm on which TA builds up are also historically situated. Thus, one can speak of several generations of TA institutionalization attempts in Wallonia.

4.1. First Phase: the uncoordinated emergence of TA (mid1980s – beginning of 1990s)

The first reflection on TA in Wallonia started in 1984, when the former Minister in charge of New Technologies (M. Wathelet, christian-democrat) was intrigued by the contemporary transformations in Flanders, with the so-called “third industrial revolution” campaign (DIRV) and the creation of Stichting Technologie Vlanderen (STV), a foundation composed by members of the Flemish economic and social council (SERV) which carried out some TA-like activities. In Wallonia, some members of the equivalent Walloon economic and social council (CESRW) were in favor of a similar endeavor, but

⁶⁰ This part is largely inspired by some of our previous work (Delvenne et al. 2013), which is itself an actualization of the work previously carried out by Delvenne (2009).

they encountered a strong parliamentary opposition, mainly from the liberal and christian-democrat parties who feared that TA would reinforce the social partners. This was also the time when in Europe an international momentum in favor of parliamentary TA opened-up, with a series of organizational creations such as France in 1983, Denmark in 1985, the Netherlands in 1986, United Kingdom in 1989 and Germany in 1990.

Nevertheless, at the end of his mandate in 1988, M. Wathelet proposed a study on the opportunity and the feasibility of a PTA institution in Wallonia. This study was delegated to the CRID (Research Center in Informatics and Law) at the University of Namur. The CRID team visited several TA institutions (like OTA and DBT) and recommended a TA model quite similar to OTA. The CESRW reacted with skepticism and highlighted that this proposition fit neither the Walloon context nor the needs of potential users. In this proposition, on the contrary, social partners had to fear a dilution of their consultative role to be shared with another organization. Furthermore, the analysis was considered too legally-institutional and did not give enough attention to the on-going evolutions in TA concepts and methods such as the participatory turn in Denmark or constructive TA in the Netherlands.

In the beginning of the 1990s, there was also evidence of an interest for TA at the federal level. The federal science policy administration organized a first national TA conference. No follow up event has been recorded since. Valenduc & Vendramin (2006) mention a few attempts at creating a parliamentary TA institution at the (federal) senate, but none succeeded. This particular TA momentum was lost due to important Belgian constitutional reforms in the late 1980s. Finally, Flanders created the VIWTA (later IST) in 2000, further contributing to make TA a regional issue in Belgium.

4.2. Second Phase: The rise and fall of regional, social-concertation TA (beginning of the 1990s – beginning of the 2000s)

The second initiative came from G. Valenduc, Professor at the Université de Namur and representative of the Christian labor union in the research commission (yet to become CPS) of the CESRW. In 1991 he obtained from the succeeding Minister A. Liénard (also christian-democrat) the financing for a new exploratory project called EMERIT (Experiences of Mediation and Evaluation of Research and Technological Innovation). His idea was to catch up with recent developments in other European regions in terms of regional TA and TA based on social concertation such as the TA Academy in Baden-Württemberg or Stichting Technologie Vlaanderen (STV) in Flanders (Valenduc, 2007). The objective differed considerably from the first project of supporting parliamentary decision-making, as it centered on creating an innovation-friendly and socio-economic oriented social climate. In other terms, the project put forward the idea of public debate broadened to S&T issues and mediated by organized civil society, acknowledging the

formalized and structured dialogue of social partners typical of the Belgian model of social concertation. In 1994, following a conference in the framework of the EMERIT project, Minister Liénard announced his proposition to assign the CPS with a TA mission.

The CESRW, which houses the CPS, although skeptical to the TA principles, accepted the budget and the mission. CPS's traditional role is mainly consultative and the new TA mission had to meet 4 additional functions: technological scouting and foresight; impact analysis; elaboration of alternative technological scenarios; information and public communication of science. The TA body's designated users were the Government, the Parliament and the administration. A coordination committee was set up and studies were delegated to different university research centers through calls for tenders⁶¹. A specific budget was made available: 17 million Belgian Francs (+/- 425 000 €) for the period between 1995-1998 and 8,7 million Belgian Francs (+/- 220 000€) between 1999-2002.

During the first programming period, the committee realized a study on urban transport (impacts and alternatives scenarios) and disseminations activities on "new materials". During the second period the CPS organized some vulgarization activities and commissioned two studies: the first on the relationship between new Information and Communication Technologies (ICT) and new work patterns in the press sector. The second study on domestic waste reduction became a didactic example of the various impacts of technology. Retrospectively, CPS representatives confessed that the tackled issues were deliberately kept very specific (e.g. the press sector exclusively) so as to notably remain consensual and avoid conflict between social partners. The subjects of the studies were chosen by the CPS itself, which never received any formal demand from the Parliament or the Government. This reality contributed to the decision, in 2002, to stop (not renew to be precise) CPS' TA mission, considering that it had failed to meet their users' political needs and to push the social debate forward.

Retrospectively, Walloon scholars have tried to understand the failure of the regional model of social concertation TA. Upfront, Valenduc (2007) observes that historically, the regional TA model has failed in other places as well (Flanders, Baden-Württemberg or Nordrhein-Westfalen). None of these experiments still exist today. He suggests two reasons for this decline. At first, the social concertation model rooted in a long tradition in the field of work is not easy to transpose to another policy sector, perhaps especially research and innovation. According to his experience, social partners are also at unease with interdisciplinary knowledge or in dealing with controversies (Valenduc 2007). Additionally, they may be reluctant to other forms of (citizen) participation - a concept that was intensively developed and discussed in the TA community at this time. In such

⁶¹ Those contracted centers changed considerably over time, thus preventing the accumulation of excellence in the domain.

participatory approaches, they see their representativeness threatened. The last point retrospectively acknowledged by CPS representatives themselves, is the consensual and controversy-adverse character of TA studies at the CPS. On a more systemic level, Delvenne (2009) argues that the rather unarticulated Walloon regional research and innovation regime of the 1990s was not ready to accommodate a proper TA institution. A strategic science regime, Delvenne (2011) argues, is a necessary condition for the successful institutionalization of TA.

4.3. Third phase: Efforts to install an EPTA-like and participatory TA in Wallonia

4.3.1. An action research on TA in Wallonia

The early years 2000 are characterized by barely any political activity in the field of policy-oriented TA (except for a note in the party programs of the Greens for the federal election in 2003). In May 2011, however, the Walloon Government announced a project for installing a Walloon Institute for Technology Assessment. To understand how it came to such a decision, one needs to go back to 2006. Around that time, P. Delvenne in the framework of his PhD research (Delvenne 2011) became interested in comparing different PTA organizations in Europe. Hence, he also interrogated the absence of such a body in the southern part of Belgium (in contrast to the Flemish situation with the creation of VIWTA in 2000). This research contributed to substantially raising awareness among policy actors and detect potential support for such a TA capacity in Wallonia. In a first phase of the research 51 actors from public administration, government, parliament, consultative organs, labor unions, CSOs, industry, competitiveness clusters, universities and research centers were interviewed. They were asked to express their opinion on the following points: the missions and clients for a Walloon TA; the political independence of a TA institution; the participation of lay people in the TA process; and the institutional location of a TA structure (Delvenne, 2009).

The results highlighted strong expectations in terms of macro-economic repercussions of the TA practices in terms of growth and job creation but also avoiding costly technological-lock-ins. Possible addressees of TA were considered broad and intertwined. Parliament was never mentioned without the government – an indication of the relatively weak separation of powers in Wallonia. The administration played an important role as well as economic actors, especially SMEs, which are in demand for services in terms of technological scouting, legal advice and bridging the gap between research and industry. Knowledge-production also was concerned with technological scouting and popularization of science. Unintended impacts and the stimulation of social debate on new technologies ranked last in participant's responses. Besides an identified

lack of knowledge and cultural experience with participatory TA, most informants acknowledged a whistleblowing function to citizens but remained in the deficit model of public understanding of science. Thus, TA should help to overcome public resistance and solve techno-scientific controversies by better informing citizens (Irwin and Wynne 1996).

Regarding political independence, the Flemish IST model was presented for scrutiny and well received. Additional comments were made to ensure greater professional and editorial independence. The issue of independence was discussed further, notably independence via pluralism that could be achieved in a parliamentary setting but the “particratic” system and voting discipline were identified as obstacles in that regard. The experts were also consulted on whether a new organization should be created or if TA functions should be integrated in an existing structure. The second option gained the most support. Concretely it was the CPS that was put forward for its pluralist character, its relative neutrality and its independence from decisional areas. However, it was also stressed that some sort of “subsidiary” needed to be established in the parliament to encourage and channel demands from MPs to the TA body (a sort of *ad hoc* commission or something similar to the German TAB’s group of Rapporteurs).

4.3.2. The political uptake

The results of this research were publicly announced during a workshop on the 10th of October 2008 (corresponding with the end of the legislative term) at the University of Liège. The workshop brought together national and international experts on TA, policy-makers (including the Minister in charge of New Technologies and Research – M.-D. Simonet, christian-democrat) and regional innovation actors to discuss TA in Wallonia with reference to foreign experiences (IST from Flanders, Rathenau Institute from the Netherlands, OPECST from France and the European Parliament’s STOA). During that workshop, Regional MP J. Kapompolé (socialist) publicly announced a proposal for a parliamentary resolution. Other MPs (H. Jamar, liberal and G. Gilkinet, ecologist) as well as the then Minister for New Technologies and Research declared supporting such proposition. The parliamentary resolution subsequently passed unanimously at the Committee for International Relations, International Cooperation, Research, New Technologies and Telecommunications at the Walloon Parliament in November 2008.

The path of the TA project got altered throughout the way of its further implementation. The results of Delvenne’s study that summarized the views of Walloon innovation actors got partially taken up elsewhere (particularly the economic dimensions such as technological scouting, legal advice or issues of administrative simplification⁶²). There

⁶² Economic missions are not at the forefront anymore. This is notably due to the fact that the Walloon government and its administration are committed to establish technological scouting and legal advice for SMEs

are also several changes the project went through from the resolution of 2008 to the Ministerial declaration of 2011, before the Parliament took it up once again in 2014.

According to Kapompolé et al. proposal of 2008, the TA unit should have been “*located inside the Walloon Council for Science Policy (CPS), [...] 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*” (our translation). A special line of funding was considered. Lots of questions remained, though. During the regional elections in 2009, the idea was taken up by the socialist and ecologist parties’ programs, and after the elections, the new coalition (socialists, ecologists, christian-democrats) put the installation of a TA institution on the Government’s agenda in the Regional Policy Declaration. The mention of Technology Assessment in the chapter on “*capitalizing on research and development*” (DPR 2009: 84) was very similar in wording to the text in the socialist party program. Notable exception: it specifies that the “*TA process would be organized by the CPS Wallonia-Brussels*”. Unlike the CPS of the Walloon Region, such a body did not exist at the time (until today) and this projection of TA processes within a body yet-to-be-born reflects the will of an increased collaboration and integration between the regional and community entities, notably in science policy.

In May 2011 the Ministers J.- C. Marcourt (socialist in charge of new technologies at the regional level) and J.-M. Nollet (ecologist in charge of research and science policy at the community level) referred to Kapompolé’s initiative to announce a joint initiative for a Walloon Institute of Technology Assessment (Serret 2011, Walloon Government 2011). The declaration emphasized its clarifying role for policy-making as well as its contribution to social debate. It was presented as a “revolution in governance” and the missing “linking mesh” between the worlds of science and technology, policy and society. The ideas of broadening CPS’ missions to TA or the creation of a CPS Wallonia-Brussels were abandoned. In the meantime, the Walloon CPS had expressed itself against the idea of endorsing once again such a TA function as well as against the erection of an additional CPS Wallonia-Brussels. The Ministers rather proposed to create a new structure dedicated to TA as an independent office within the Parliament, which would further rely on a network of experts (it further specified that a small group of pluridisciplinary people would operate at this interface, without necessarily being ultra-specialized scientists). The Government and the Parliament were identified as the main users of this 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 studies. Is it also worth adding that the proposal emphasized the importance for the future structure to be able

in agencies dedicated for such task. The overall rationale where TA should contribute to the economic redeployment still remains, as we will see later.

to mobilize participatory methods⁶³. An explanatory phase and a pilot-project were planned to start at the end of 2011, with a budget of € 250 000.

After this declaration in 2011 nothing visible happened. Interviews revealed that political tensions arose between the two Ministers in charge, which led to a (temporary) blockade of the project. In the end, the pilot-project was never launched. The mentioned difficulties relate to divergent political visions for the French-speaking territories in south of Belgium, rather than opposing perspectives on TA. The main issue concerned the addressees and sponsors of the TA institute: one Minister (Marcourt, a convinced regionalist) wanted the TA institute to work exclusively for the Walloon Region (Parliament and Government) while the other Minister (Nollet) wanted the TA to also address the Parliament and Government of the French Community. The regionalist argument refers to regional innovation theory and the importance of territorial aspects, which are supposed to considerably differ between Wallonia and Brussels. On the other hand, the ecologist Minister Nollet sought to orientate the research landscape with a vision of increased integration of both French-speaking territories. This is reflected in the idea of a new Science policy Council across Wallonia-Brussels⁶⁴ or in his science policy declaration “for an integrated science policy” (Nollet 2011). These incompatible views remained at the heart of the blockade until 2014.

4.3.3. Concomitant PACITA activities

This above-mentioned political momentum got timely but unexpected international support through the European project PACITA (see PACITA chapter 2). From 2011 onwards, the SPIRAL research center at the University of Liège got involved in this endeavor and could continue to put TA on the political agenda - notably by continuous interaction between research and discourses about TA. Like all partaking countries/regions that do not have formalized TA bodies (the so-called non-PTA countries) SPIRAL initiated two debates on the relevance of installing policy-oriented TA in Wallonia. The first one in Namur in May 2012 gathered a sample of around 40 Walloon innovation stakeholders to exchange with a delegation of TA-Swiss (composed of the board’s president, the director and the MP historically behind the initiative to install TA in Switzerland). In June of the same year, SPIRAL also held the first European Summer School on TA in Liège⁶⁵.

⁶³ As mentioned above, this is relatively innovative and uncommon if one thinks back of the lack of direct participatory culture in Wallonia/Belgium, very much influenced by a neo-corporatist tradition.

⁶⁴ This CPS Wallonia-Brussels never saw the light of day.

⁶⁵ Among the thirty-five international participants was a Walloon MP, representatives of the ministerial cabinets of both Nollet and Marcourt, an employee from the Belgian federation of consumer protection as well as a series of researchers both from Social Sciences and Humanities and Natural Sciences and Engineering.

After several exchanges with the authors of the resolution, a synergy was created between the PACITA project, more specifically its local enactors (SPIRAL), and members of the Walloon Parliament. Hence, an international conference in the Walloon Parliament entitled “new technologies in debate” was organized in March 2013⁶⁶. It was at the same time as the kick-off for a series of working lunches with MPs in the Parliament. Given the fact that TA was already, although contained in confidential circles, on the governmental agenda but subject to a blockade, SPIRAL and some MPs envisioned to somehow bypass this blockade with a closer collaboration with Parliament. The conference was intended to put pressure on the government, to continue to make TA known to a wider audience and, finally, to kick-start the working lunches and use them to further sensitize the members of Parliament for Technology Assessment to show what TA could potentially deliver to the policy-making process (Van Oudheusden 2013a). For this endeavor, a working group inside the parliament was set up. In other words, it has been a first small formal achievement in terms interest for TA in the Walloon Parliament. It was composed of 4 Members of Parliament (plus 4 alternate candidates) from the committee for energy, housing, public service and scientific research. Prior to the instalment of the working group, a note was elaborated by J. Kapompolé and the SPIRAL team, considering several options for such a temporary structure in the Parliament. It was finally chosen to go for the working group option because it is administratively light and doesn't require a quorum (i.e. a minimum number of members) to be operational. This working group thus officially hosted the conference and then formally initiated a series of TA working lunches and their planned evaluation in close collaboration with SPIRAL research center.

Subsequently, a series of three TA working lunches took place in the Walloon Parliament after this conference. The MPs from the working group chose topics on the basis of a list suggested by SPIRAL and based on their monitoring of salient TA issues and available expertise⁶⁷. The methodology of these lunch sessions was iterative and inspired by role-playing and simulations. Accordingly, the terms of the presentations and roles assigned to invited experts, attending politicians and the facilitating team of SPIRAL changed

⁶⁶ The conference of the 8th of March 2013 conveyed TA experts from the former Office of Technology Assessment in the American Congress (T. LaPorte), the STOA at the European Parliament (T. Karapiperis), the Flemish IST (R. Berloznik), the Austrian Institute for Technology Assessment (M. Nentwich) and TA-Swiss (Da. Bütschi). It also invited and gave the floor to several MPs, representatives of Ministerial Cabinets, prominent Walloon researchers (formerly) active in the field of TA (G. Valenduc, C. Lobet), public participation (M. Reuchamps) or European science policy (N. Dewandre) as well as promising young scientists (K. Hendrickx, D. Goffin) that would elaborate on the social and political dimensions of their work. An audience of approximately 100 comprised interested citizens, organized civil society as well as high-level actors of scientific governance (including university rectors, heads of administration and governmental agencies etc.). See also: <https://tapw.wordpress.com/> [last accessed 30th March 2017] and van Oudheusden 2013a)

⁶⁷ Out of ten propositions, the themes of “ageing and telecare technologies”, “data mining and cloud computing” and “sustainable consumption” were chosen.

from one topic to the next so to show different possible ways of doing PTA and highlight the possible roles associated to specialized experts, MPs and TA practitioners. During the first session, an expert was auditioned and the MPs suggested what kind of study they would like to commission on the topic of ageing and telecare technologies. The simulation entailed that the MPs would perform or at least be commissioning the TA study themselves – more or less like the French OPECST or other committee model PTA organizations (Enzing et al. 2012). From the organizers' experience, the discussion resulted in a lack of realism from the involved MPs, especially with regard to the budget and time allocation for the desired output and a rather technical debate with the auditioned expert. For the second topic, two legal experts were invited to first of all cover some of the security, safety and privacy issues relevant in a regional and Belgian context regarding cloud computing and data mining. In a second phase, the SPIRAL team proactively simulated the role of a TA secretariat and presented two contrasting propositions for a fictive project (one more expert-oriented, the other rather participatory-oriented). Efforts were put in place to make it as relevant for the region as possible and to render the proposition very concrete in terms of time, human and financial resources. The MPs were placed in the role of board members of a TA institute having to validate the upcoming working program and choose the most interesting of the proposed projects. This more proactive approach is usually found in so-called "independent" TA organizations (Enzing et al. 2012) such as TA-Swiss, DBT, NBT, or the Rathenau Institute. The third working lunch session addressed a recurring demand from the MPs of the working group, namely to get to know more about what other TA organizations are doing and possibly profit from their work and expertise, notably to save costs and time (we will come back to this argument). To face such a demand, a TA practitioner from the Rathenau Institute came to give a presentation (in English but translated in real-time) about a project proposal on sustainable consumption (alternative meat burgers). MPs were subsequently asked to react and state how such a project could be useful to their own legislative work. Following discussions were primarily concerned with tailoring such a project to the Walloon context. Besides a language barrier, participants emphasized the importance of cultural differences in the selection and framing of the issue (regarding the food technologies themselves, their cultural embeddedness in eating habits or different offers on the market).

During a fourth session, the working lunches program was evaluated based on an online questionnaire and a subsequent discussion with the MPs about the lessons learned. The results showed a quantitatively limited interest (not many newcomers from the Parliament had shown up apart from the working group members), compensated by qualitatively thorough discussions and longitudinal commitment of this core group of MPs. The exercise was considered as a collective learning process between the organizers and the MPs, notably in terms of mutual expectations, competences and working modes. Furthermore, the working lunches rendered TA more concrete and

palpable for the present MPs by bringing in concrete methodological and financial considerations. It was concluded that further series of TA working lunches were desirable but also that the Parliament should take over and push the dossier of TA given the sustained silence from the Government. Thus, it was decided to draft a bill operationalizing, but also updating the 2008 resolution and aiming at creating a TA structure in Wallonia.

On the 18th of February 2014, The President of Parliament, Members of Working group, Assistants of the Ecologist and Socialist groups in the Parliament, Collaborators of Ministerial cabinets and SPIRAL researchers came together in the library that the socialists and ecologists share inside the Parliament's premises to draft a decree proposal. It will be signed by five regional MPs from all parties, majority and opposition: J. Kapompolé (socialist), C. Noiret (ecologist), P. Dupriez (ecologist and president of the Walloon Parliament), A.-C. Goffinet (christian democrat) and H. Jamar (liberal). On the 2nd of April 2014, the plenary session of the Parliament sent the proposal to the committee for energy, housing, public service and scientific research. However, this commission never got the chance to deliberate or to vote on it, since the Parliament was dissolved because in May 2014 new European and regional elections were to be held.

Elections' results brought about a new regional majority formed by the socialists and christian-democrats. The ecologists were relegated in the opposition and with only four seats, they are no longer represented in every parliamentary committee. Until today, the working group on TA has not yet been re-installed. The competences the "TA dossier" touches upon are now concentrated with Minister Marcourt. With this new term, he is now in charge of both competences (innovation on the regional level and research on both the community and regional levels). However, notwithstanding the concentration of TA-related matters in Marcourt's competences, the plenary session of 24th September 2014 sent the decree proposal to the newly created "*special commission of democratic renewal*" chaired by the President of the Parliament A. Antoine (Christian-democrat). The latter commission was pushed by the Minister-president P. Magnette (socialist) and installed by the parliamentary majority to tackle the perceived growing distance between citizens and their representatives. It is more broadly concerned with a revalorization of parliamentary activity and citizen engagement in politics. So far it has examined a series of proposals aiming at further entrenching citizen participation in Wallonia. Up to this day, the decree concerning Technology Assessment has remained in the backlog of this committee, which has finally not brought the expected "renewal" to the Region and almost never meets anymore. Before we discuss the implications in terms of co-production of those recent evolutions, we want to first consider and characterize the institutionalization process of this particular form of TA and how it relates to alternative visions of TA in Wallonia.

5. Characterization of the different institutionalizations of TA

The present section will look into different succeeding, partially overlapping phases and generations⁶⁸ of policy-oriented TA in Wallonia. Following the definition and operationalization of institutionalization in Chapter one, the presentation of each of these phases will be structured according to both organizational and cognitive dimensions. The cognitive dimension will concretely be explored by referring to discourses about TA that policy-makers, addressees or promoters hold as well as their reflexes of referring to TA in a given context. Another cognitive aspect is the characterization of the community of practice or epistemic community. By looking into the following elements: the existence of a (national) society or association; the mobilization of quality standards or professional norms; the publishing of a scientific journal; or the organization of regular conferences; as well as the existence of a market with a plurality of competing actors.

Organizational dimensions concern the presence of the practices in different “instances” or “bodies” such as parliament, government, science and technology as well as society. After reviewing the different generations and roughly presenting them according to different constellations in terms of involvement of the four spheres of inclusive modelling, we will deepen the approach on the current developments following the main data we have gathered.

Subsequently, the institutionalization phenomenon is here understood as a multi-faceted process rather than a binary property (i.e. institutionalized or not ⁶⁹). The process is also neither linear nor natural (general tendency from less to more institutionalization). Instead we can also identify different generations or paradigms of the same practices that evolve, co-exist or even conflict. While some forms disappear, others may emerge. Furthermore, underlying rationales, justifications and discourses can vary; the actors promoting TA change and the practices and target-groups evolve over time.

⁶⁸ In the Walloon context, we will use “generations” and “phases” as synonyms. If not otherwise specified, the “generations” of TA in Wallonia cover a specific and local reality and do not necessarily correspond to different generations of TA in the other countries studied (e.g. the Czech Republic) nor refer to broader encompassing generations of Technology Assessment on a general level.

⁶⁹ As we mention in chapter 1, in the majority of the literature on Parliamentary Technology Assessment, institutionalization is not highly problematized. Institutionalization is often equated with the formal setup of a TA organization to which authors then proceed to comparisons. See also the concept of “organizational deficit description” in the PACITA chapter 2.

5.1. Three historic phases of institutionalization

Since the mid-eighties, three (and a possible fourth) of such institutionalization processes can be identified (see Figure 8). From the history of TA in Wallonia, we can clearly see a change in the way TA was conceived from the first uncoordinated interest and discourses about TA, the temporary institutionalization of the social concertation TA and the current efforts at organizationally sitting a participatory TA working for both the government and the parliament. As depicted in the graph below, the phases sometimes partially overlap in time, build on each other, while progressively changing the paradigm along with a rearrangement of involved actors. The first two periods will be briefly sketched before we put them into perspective and go more into the details of the activities in the third phase, with a particular view to the organizational and cognitive dimensions of institutionalization as well as the coproduction of knowledge and social order in this particular phase.

Finally, we will discuss the possible emergence around 2015 of a fourth phase and a possible new paradigm in which divergent voices and discourses (grounded in theoretical reflections and/or practical considerations) make up a nebula and potential fourth phase of institutionalization that partially addresses some limitations of the third phase – in particular the organizational dimensions it advocates.

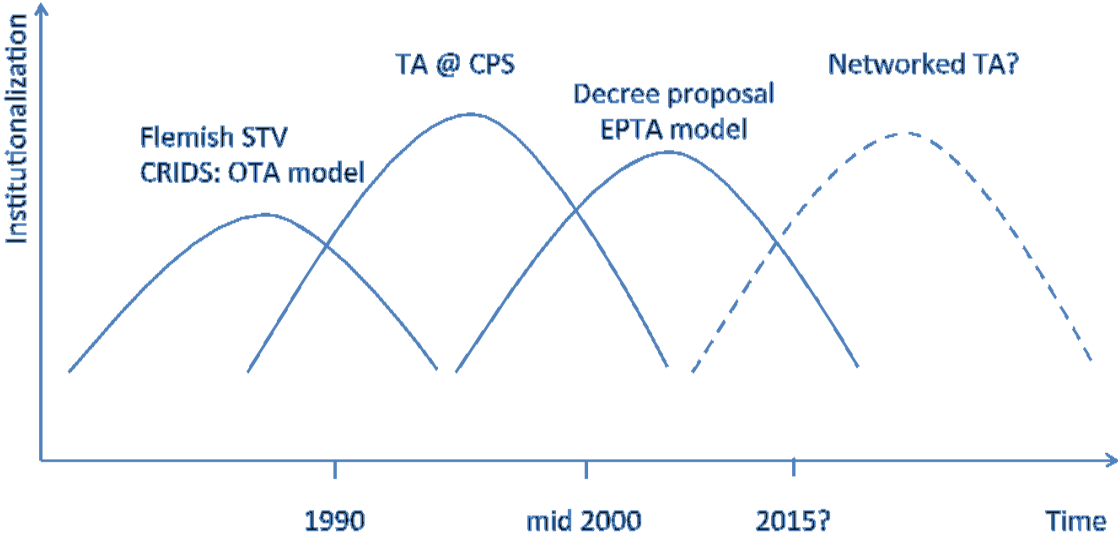


Figure 8: Historic Phases of Institutionalization of TA in Wallonia.

5.2. Uncoordinated and paradoxical discourses about TA

The very early phase of the take up of TA in French-speaking Belgium was mainly concerned with a series of uncoordinated discourses. In the very young regional structure, the Minister-President had to react to the Flemish instalment of Stichting Technologie Vlanderen (STV) in a period where PTA also internationally gained momentum. More or less simultaneously, there were activities at the federal level. In addition to different policy levels involved, TA models also started to diverge and adapt to local peculiarities. A feasibility study commissioned to the CRID research center came up with a suggestion inspired by the American OTA model (see Delvenne 2011 for review). Flanders was experimenting with regional and social-concertation TA while the Netherlands experimented with constructive TA and Denmark pioneered in participatory Technology Assessment. These elements combined gave rise to quite paradoxical discourses. Social partners feared a dilution of their consultative power whereas the right of the political spectrum (some strands of the christian-democrats and the liberals) were on the contrary afraid of a reinforcement of the social partners. The reflections never gave rise to an organizational creation nor concrete results that could have been used in policy-making. The momentum eclipsed in the late 1980 due to the political attention directed towards major transformation of Belgian federalism.

5.3. Regional Social concertation TA

The type of TA advocated by the FTU and the EMERIT project, which later resulted in an organized TA mission within the Science Policy Council (1994-2002) was inspired by regional TA experiments (especially Baden-Württemberg). Initiated by the Government, it was rooted in the Belgian consociational and neo-corporatist system – i.e. a strong involvement of social partners with a view to social concertation and in the present case “constructive” implementation of technological options. Organizationally speaking, a small secretariat was housed in a so-called independent advisory council. Actor-wise it was mainly representatives of the science system and social partners that were involved in the definition of the working program. Final addressees were government and parliament but they were not involved in the process leading to the reports. Besides successful public understanding of science activities there is no record of political use of the results, nor of concrete demands addressed at the TA unit. As Delvenne (2011) has highlighted, studies were outsourced to ever changing university research centers, hindering the accumulation of centralized expertise. This impression was confirmed in later interviews with CPS staff. The relative involvement of these different spheres of science (mainly social sciences in the TA work and science representatives in the board), society (through social partners), parliament and government is represented in the Figure 9. A small group of researchers from FTU were active in an international community of practice and made theoretical effort on the social-concertation model,

notably around the EURETA network and the EMERIT newsletter. They contributed with local and international publications and conference contributions. When terms such as social debate were used, it primarily meant a debate between social partners, not one directly involving other stakeholders groups or citizens.

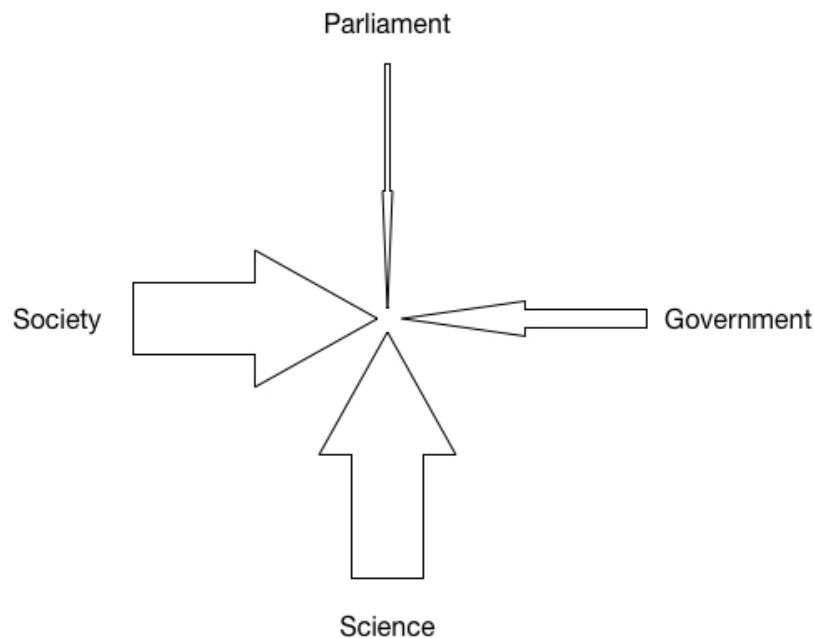


Figure 9. Regional social-concertation TA model at Science Policy Council

5.4. Participatory and policy-oriented TA decree proposal

The Walloon TA project, as it is currently incorporated in the latest decree proposal of Kapompolé and Jamar (2014) about the creation of TA institute in the Walloon Parliament is quite different in some regards. On the organizational level, we find several considerations about concrete organizational settings and working modes.

5.4.1. Organizational aspects and inclusive modeling

The ministerial cabinets in charge of the dossier put a lot of effort into the legal specifications and options and toughly negotiate to settle issues such as: shall the TA unit address the Walloon Region and/or the French Community? Related questions were: what kind of legal status for the institute? What would the composition of the board be? How to include citizens? Where is the budget coming from?

Firstly, besides the many projective considerations, the concrete organizational achievements so far are rather minimalistic. The parliament of its own initiative installed a transitory working group. In terms of organizational settings, it is the most informal structure compared to standing committees. The main argument in favor of this light solution was to avoid administrative constraints (such as the quorum, i.e. a minimal ratio of presences for it to be operational). Contrary to a committee, a working group is also dissolved after the elections and needs to be re-installed. Despite a new impetus from MP C. Morreale (socialist party) and a meeting with different political groups, this has not yet happened during the current term (2014 – 2019).

Secondly, the institutionalization seems to follow a general trend of specialization. Albeit ambiguous responses in the online Delphi inquiry conducted by (Delvenne 2009) and first attempts to locate a TA unit in a new CPS Wallonia-Brussels, the latest idea is to envision TA in a new independent, specialized, dedicated and regionally bound unit within the administration of the parliament. Thus, it would remain distinct from foresight or evaluation organizations for instance.

Hennen and Nierling (2014) have identified three ideal-types of TA advocates and their institutionalization strategies⁷⁰ in countries or regions with no formalized TA structures. Wallonia is put in the category of “supporters of parliament”, which according to the authors applied to Wallonia since the recent efforts are concentrated towards the creation of a TA unit within the Walloon Parliament, even though the unit would have both the Walloon Parliament and the Government as its main addressees. This qualification is also the closest to the existing PTA landscape in Europe, as represented in EPTA and despite its diversity in existing models.

Furthermore, reference was often made to the so-called interactive model (Hennen & Ladikas 2009) or independent institutes (Enzing et al. 2012) by emphasizing both the information role towards policy-makers (both parliament and government) and the stimulation of social debate. This particular vision of TA was *de facto* aligned with the PACITA project and its regional partner organization: SPIRAL. Indeed, as we have shown in the respective chapter, encouraging participatory TA was one of the declared objectives of PACITA. SPIRAL publications also presented participatory TA as the most reflexive and thus “advanced” form of TA (Delvenne 2011; see also chapters 1 and 2). Being part of its core business, the research center further contributed to put participation on the agenda on several occasions (during the working lunches, for

⁷⁰ It is important to note here that it occurs that the actors diagnosing the situation and proposing strategies have themselves stakes in the development of the TA practice or its institutionalization. As Hennen & Nierling (2015: 5) put it: “in some case the authors of the articles even play a double role: a scientifically trained observer of institutional landscapes on one hand, and a national political entrepreneur of TA on the other”.

instance, or with a panel on technologies of democracy during the 2013 conference at the Parliament).

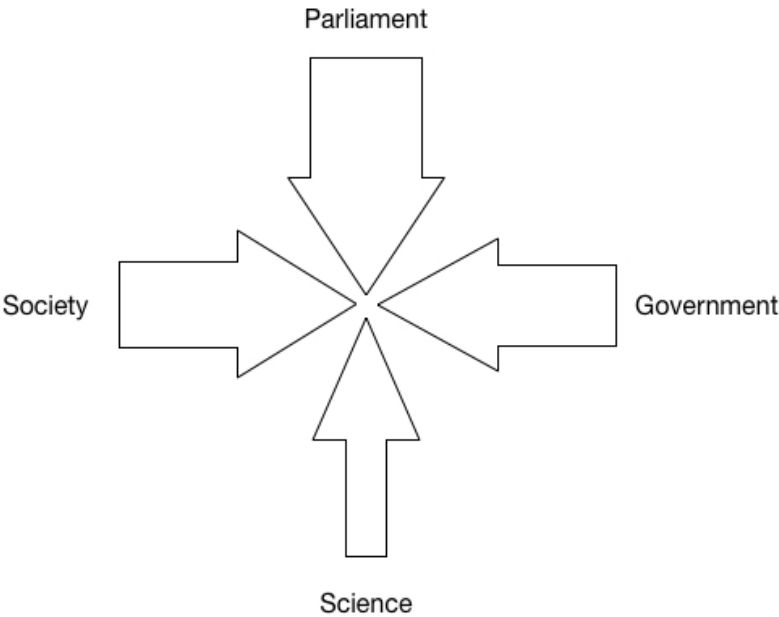


Figure 10: Policy-oriented TA as in the decree proposal of Kapompolé & Jamar (2014)

Despite numerous power struggles, the decree has tried to strike a balance between the executive and legislative branch in terms of financial contributions, procedures of referral and representation in the board. In the latter, civil society is involved through appointed CPS representatives but potentially broadened out to other civil society actors by means of petition. Furthermore, great emphasis is placed on the use of participatory methods, notably on citizen participation. Science and Technology is also supposed to be represented in the board through two representatives of the Science Policy Council and the Academy of Research and Higher Education. However, the mission statement leaves room to interpretation when it comes to the scientific input and format of the work that the TA institute should be carrying out. The triple mission statement comprises (1) to issue recommendations to policy makers based on (2) research “or any other appropriate means” and (3) societal debate. The knowledge delivered to policy-makers can therefore be of various origins and formats and does not necessarily have to meet scientific standards. The identified intensity of involvement of these 4 spheres in the TA in project is depicted in Figure 10 and detailed in table 2.

Institutional level	Mission	Issue clarifications, advice, recommendations and possibly highlight alternative policies to policy-makers by research or any other appropriate means Stimulate societal debate
	Client	Parliament and Government of the Walloon Region as well as the general public (via petitions)
	Funding	First a pilot project of 250.000€ announced earlier by the government Decree foresees funding by Parliament Possible contributions from the Parliaments and Governments of the French- and German-speaking Communities and the Brussels-Capital Region is they request the service of the institute
	Evaluation	First evaluation of the working lunches and 2013 conference with TA Working Group in Parliament. Activity report addressed to both the Parliament and the Government
Organizational level	Staff	Operational Cell composed of 3 Full-Time Equivalents (Director, Project-manager and communication officer), administratively attached to the Parliament Stress on interdisciplinary competences (not just science) Part of the work is possibly outsourced to research institutes or other societal study organizations the council deems relevant
	Board	Council (14-15 members) Composition: made up of one elected Parliamentarians of each recognized democratic political group, four representatives of the Science Policy Council at the Social and Economic Council of the Region (CPS-CESRW), four representatives from the Academy of Research and Higher Education (ARES); two representatives of the Government proposed by the Minister(s) in charge of respectively research and new technologies. Observers in advisory capacity: Director of Operational Cell and the representative of the Walloon Institute for Evaluation, Foresight and Statistics (IWEPS). The decree proposal stresses its independence, the pluralistic composition and the necessary competence of its members in the fields of social studies of science, technology and innovation, TA and foresight.
	Working procedures	Different modes of referral: <ul style="list-style-type: none"> - Government (in its totality) - Parliament (via the Bureau of the Parliament) - 5000 signatures from citizens with formal requirements to be defined - Topics suggested by Board of Administration - Operational Cell suggests a topic to the Board of Administration <p>The council collects external or internal demands, analyses and prioritizes them. Decisions are taken with a 2/3 majority. The working program for each project is defined with the Operational Cell, which is in charge of executing the project, possibly with the help of subcontractors (science or societal actors).</p>

		Communication to the general public emphasized. Further internal rules of procedure are still to be established
Practice level	Projects	Budget, methods, timing and possible subcontracting established on case-to-case basis by the Council in collaboration with the operational cell
	Staff	See above, emphasis on interdisciplinarity and communication skills Subcontracting: research institutes or other societal study services
	Participants	Citizen Panels and other participatory method mentioned
	Advisors	Not specified but emphasis on international cooperation and exchanges with foreign TA institutes and networks
	Review procedures	Ex ante review of demands and propositions by Council in coordination with the Director of the operational cell Annual Activity Report

Table 2: Inclusive modeling at the macro, meso and micro level of TA activities in Wallonia

5.4.2. Use in policy-making

At this stage, it is difficult to establish any diagnosis of the use of TA in policy-making nor its integration in the policy elaboration cycle. From past experiences, we know that the TA Unit at CPS was never formally requested to carry out a project and it did all the work out of self-initiative. However, we can nonetheless consider the activities (TA working lunches and PACITA pilot projects) prior to the possible creation of a TA institute and put them in a broader impact framework. Following the TAMI impact grid (Decker & Ladikas 2004), we need to consider the political, scientific-technological and societal sphere with effects such as producing knowledge, raising awareness/forming opinions, initiating actions.

The TA working lunches and the conference held in the Parliament certainly contributed to raising awareness for TA in Parliament and with the Ministers in charge as it had a strong agenda setting objective. However, we are not aware of any policy impacts of the sociotechnical issues that were discussed during the conference of the working lunches (food technologies; ageing society; cloud computing and data mining; and sustainable consumption).

Yet, they initiated action in the policy sphere in the sense that the process led to the writing of the 2014 decree aiming at installing a TA institute in the Walloon Parliament. In this decree explicit reference is made to these preparatory activities as well as participation of MPs in several international TA activities (PACITA events and EPTA meetings).

With regard to the results of PACITA pilot projects, besides ongoing scientific valorization, the SPIRAL team was invited to present the findings of the ageing society and telecare project to the federation of municipal Public Social Action Centers. Lately,

the actual president of the Walloon Parliament has announced a participatory pilot project for addressing the challenges posed by the ageing population⁷¹. However, no reference was made to the previous work carried out by the TA working group in the Walloon Parliament nor to the PACITA activities.

As the organizational situation is still open-ended and uncertain, we will delve deeper into the current cognitive dimensions, the discussion about organizational settings and the strategies pursued by the main TA advocates.

5.4.3. Cognitive aspects: discourses and community of practice

The institutional level links up with the more cognitive dimension. What are the rationales and expectations when investing in such a practice? To answer these questions, in particular in the Walloon context, we will first identify a number of discourses about TA, examine in what context they are expressed, and accordingly point to what the missions for a TA in Wallonia could be.

Since approximately 2006 there is a constant interplay between several research actions and policy discourses about TA. The following paragraphs aim at thematically reconstructing this by mainly relying on excerpts from political declarations (party programs, governmental declarations, written and oral questions as well as minister's responses and invited or public speeches of MPs, Ministers or their staffers).

A first discursive element about TA is the revival of democracy and by extension parliamentary activity. The parliamentary activity is said to become more complex (Kapompolé & consorts 2008) in a globalized world (Simonet 2008). As a response to this phenomenon, TA is presented by Ministers Marcourt & Nollet as "*a revolution in governance*" (Serret 2011). Parliamentarians see it as a (re)valorization of their activity and more broadly of the role of the parliamentary institution. TA would enable MPs to actively take part in technological debates via the advice from scientists. MPs of the working group also insisted on the fact that the initial dynamic around the TA proposal breaks with ordinary bureaucratic procedures and strict party discipline and initiated a more open and collaborative cooperation among themselves. Politicians compare themselves or are compared to other European countries resulting in a deficit description in which they are left "badly equipped" (Warrant 2008 - our translation) when it comes to capture the challenges of technological development, collectively discuss them and foster their social appropriation. Additionally, TA should help replace the "*sphere of science and technology within the heart of societal debate and more*

⁷¹ <http://plus.lesoir.be/86468/article/2017-03-18/la-wallonie-tente-lexperience-du-panel-citoyen#> (accessed 30th of march 2017).

particularly within legitimate political institutions” (Delvenne 2006 cited in ECOLO 2009).

A second discourse invests TA with a mission of rationalizing the STI landscape (see also Delvenne 2009). Concretely, this means simplify the different R&D administration, funding schemes so to make them more efficient. Notably with regard to the public spending objectives of the Lisbon agenda (Jamar 2011). This argument is also often used in combination with the argument that there should be no new structure created to accommodate a TA mission and that it should not duplicate work done elsewhere (Fontaine 2008). Minister Marcourt affirmed, *“it is not just another gadget”* (Serret 2011). As mentioned earlier, Minister Nollet had big plans to integrate the science policies of the Walloon region and the French community, while Minister Marcourt was including TA within the regionalist strategies to turn Wallonia into a strong economic and innovation-oriented territory.

Thirdly, TA is also expected to help with the economic redeployment of the region. Already in Delvenne’s Delphi study in 2009, economic missions ranked first among respondents’ views. More recent interviewees additionally mention possible synergies with the European agenda of smart specialization, or they expect TA to avoid social resistance to technological change and to reduce the associated costs. With a strong research basis, TA should be future-oriented (Nollet 2009), stimulate innovation and redress the economy. An often heard motto is to *“maximize the advantages of technological evolution and trying to reduce the costs”* (Kapompolé et al. 2008 - our translation) notably by contributing to a better acceptance, uptake and use of technological innovations.

On the level of the community of practice (or a possible epistemic community of TA) the findings are relatively minor. There are no professional or scholar associations around TA on the regional level. Training and qualification schemes are non-existent, just like dedicated journals. The EMERIT pilot project at FTU aimed at examining the conditions for a successful implementation of social-concertation TA. This project produced a considerable amount of knowledge, notably in issues related to ICT, work, gender, youth and ageing. More generally FTU’s focus was heavily on ICT issues, digital inclusion, as well as more general relationship between new technologies and working and living conditions as well as transformations of public services⁷². They were also connected to European Network Technology Assessment and Region (EURETA) and with their participation in conferences and publication activities they contributed to the theorization of the regional, social-concertation paradigm of TA. The last EMERIT letter

⁷² <http://www.ftu-namur.org/publications/publi-2.html> (last accessed 25th of April 2017)

(which was not only focusing on TA) was published by FTU in 2011 with a total of 67 publications and no new equivalent has taken over this diffusion task.

Today, TA is not a generalized practice and the actors acquainted with TA are limited but well informed. Social science and humanities research centers play a prominent role in the development of the practice and have been in constant interaction with the relevant policy-makers. It is generally acknowledged that a small amount of research centers in Wallonia have accumulated relevant expertise in (doing TA) and about TA (analyzing TA) over a longer period of time (Warrant 2008, Hoyos 2011, Delvenne 2009).

However, the several research centers involved in the practice of TA do not feature the name “Technology Assessment” in their acronyms. The research center of the Foundation Travail-Université (FTU) has moved to the Catholic University of Louvain and merged into a new chair Labor-University. The CITA (Interdisciplinary Unit for Technology Assessment) within the CRIDS research center (Research Center Informatics, Law and Society) has recently changed its name in UTS (Unit Technologies and Society) and abandoned the TA denomination although still working on societal and ethical aspects in accompanying research of different innovation projects from the regional to the European level. Besides CRIDS, SPIRAL became more prominently active in TA-related research and activities in recent years. Both research centers have successfully managed to work together on several projects throughout the years. More recently they have collaborated in order to foster TA in Wallonia with participation in debates initiated by the PACITA project, on the international conference in the Walloon Parliament in March 2013, the subsequent TA working lunches and other research projects and conferences.

As mentioned earlier, the structuration of a community of practices seems to be happening on the European level above all. However, several local actors have been taking part in the structuration of this international community and more recently around the PACITA project. Amongst other well-documented activities (see Klüver et al. 2016 for an overview) it organized two major European conferences on TA (thereby resuscitating a 1980s tradition of European TA conferences), two summer schools, four practitioner-training seminars and edited a magazine on science and technology in society issues⁷³. More recently, after PACITA, SPIRAL researchers have continued to invest the European TA community by attending an EPTA practitioner training in Austria (2015), as well as EPTA conferences and director’s meetings in Norway (2014),

⁷³ <http://volta.pacitaproject.eu/> (last accessed 25th of April 2017).

France (2015) and Austria (2016). SPIRAL officially applied to become EPTA Associate⁷⁴ member, which was approved by the Austrian presidency in 2016.

The structuration of a community of practices around TA has a particular difficulty in the French-speaking world. Not only the word “assessment” ineptly translates in “évaluation” (in French there is no difference between evaluation and assessment), there are also several co-existing concepts, which hinder a common identification: “évaluatque” (Dehousse 1993), “évaluation des choix technologiques”, “évaluation technologique”, “évaluation sociale des technologies”. There is a risk for TA to be diluted in a broader understanding of evaluation. For instance, “evaluation of technologies” is often used for ex post evaluation, which is different from the way TA is understood in this PhD thesis. The argument can be further developed in what Valenduc has called “l’évacuation des choix technologiques” (the evacuation of technological options, i.e. TA). This expression captures the idea that TA may, in some circumstances, be reduced to some of its constitutive elements (for instance participation, evaluation of public policies and foresight). Taken individually, some may argue that these practices are already sufficiently in place, sponsored or institutionalized and that it is therefore not necessary to pursue the institutionalization of TA any further - especially when it is perceived as something very sectorial (the science and technology sector) as opposed to a more general topical focus and/or a specialized practice mentioned above. The argument can be further developed; not only for the constituting practices and disciplines TA builds upon but also the objectives it is supposed to meet. In the recent years we have seen a rationalization of public agencies, an economic redeployment program (successive “Marshall Plans”), which is separately evaluated (in an ex post manner). In addition, the Parliament has taken up the issue of public participation and initiated a series of expert hearings to discuss the issue (Committee for democratic renewal, when it was still frequently running). The 2014 decree allowing citizens to submit petitions to the parliament even competes with one element foreseen in the TA decree proposal. It thus partially scoops it out.

More recently the working group found these appellations above “old-fashioned” and in search of a more appealing name they proposed “Institute Sciences and Democracy”. Moreover, the present Walloon government does not mention TA anymore in its policy programs. The Marshall Plan 4.0 however uses the term “Strategic Intelligence”. Rip (2012) has already indicated that such term may take over TA in a more encompassing nebula of practices (foresight, evaluation, TA).

⁷⁴ Associate Members are not full members and do not need to comply with all requirements of 1) Being European; 2) Doing TA in a dedicated structure; 3) Having an official link with Parliament. Associate Membership is often a transitory stage pending full compliance and thus full membership. This was for instance the case for Austria. Applicants expect to symbolically reinforce their position in their home country. In the case of SPIRAL’s application, the objective is not for SPIRAL to become full member but to pressure the political authorities to push the decree proposal forward by giving it international attention and support.

6. Accounting for shifts in the politics of TA: a co-productionist approach

Although it is unlikely for STS scholars to frown with such a statement (see for instance Landgon Winner's seminal 1980 article "*Do artifacts have politics?*"), it may be more difficult for some TA practitioners to unanimously accept that **TA has politics**. But we argue that TA undeniably *has* politics (Delvenne et al. 2015; Van Oudheusden et al. 2015). It is caught in political dynamics while at the same time facilitating or even being conducive of changes that favor one political option over the other. A way forward to explore this dynamic relationship without looking for causalities is the co-production idiom (Jasanoff 2004). Considering TA is a source of knowledge-making, it helps "*explore how knowledge-making is incorporated into practices of state-making, or of governance more broadly, and, in reverse, how practices of governance influence the making and use of knowledge*" (Jasanoff 2004: 3). Consequently, TA is not only about producing knowledge, it also contributes to co-producing social and political order. Changes in the paradigm or methodologies of TA also result in changes in the politics of TA and vice versa. We propose to explore four main shifts of co-productions in areas such as the empowerment of parliament, the knowledge-based economy, the regionalist project, and a changing conception of civil society.

Firstly, a series of elements suggest a co-production of TA and the reinforcement of Parliament. Although the decree proposal, still rooted in the Kapompolé resolution of 2008, foresees a TA unit working for both Parliament and Government, the 2014 decree particularly supports the strengthening of the parliamentary institution. In the procedures resulting in the decree proposal, the parliament proactively took up a leading role. In the face of the blockade between the two Ministers in charge, it was created the working group which then questioned the Ministers about the whereabouts of the project (Noiret 2012), held the conference in Parliament, invited the ministerial cabinets to hold a speech at the same conference, and initiated the TA working lunches. Furthermore, it conveyed the ministerial cabinets to a joint decree writing process piloted by the Parliament. MPs insisted on meeting in the parliament's premises for symbolic reasons. Concretely the meeting was held in the library that both socialist and ecologist shared. The proximity of the next elections also played in the hands of the on-going process at the Parliament. Indeed, it was too late to act by ministerial decree since these norms need to transit through the Council of State (the supreme administrative court) to evaluate their constitutional conformity. The latter is not the case for parliamentary decrees, which then became the privileged option forward, given the limited time remaining before the elections. The current decree proposal foresees an

institutional location within the Parliament and integrated to its administration. The TA dossier was expected to be an additional argument to ask for an augmentation of the dotation of Parliament, which has not been renegotiated for years. The fact that during the next legislative term, the decree was transferred to the (symbolically important) committee of democratic renewal is also *a priori* a sign of empowerment of parliament since this committee is notably concerned with a revalorization of parliamentary activity. Conversely the role of social partners and social concertation is downplayed – although the latter would, via their representation in the CPS still sit in the board. Unlike the sectorial focus on the innovation system and social partners in the second institutionalization phase, the primary objectives in the current one have become the policy-making arenas of parliament and government as well as simulating debate in the societal sphere. So to speak, the recent proposal has become more policy-oriented (Klüver et al. 2015) i.e. targeting the formal institutions of parliament and government.

Secondly, there is reason to presume that TA is caught in a co-production dynamic with the advent of a knowledge-based economy. The emergence of a strategic science regime (i.e. knowledge production that is economically and socially relevant as opposed to isolated and “basic research” see Rip 2000, Delvenne 2011) has been identified as a prerequisite or necessary condition for the successful instalment of PTA. In a context where the STI policy is explicitly oriented towards the knowledge-based economy (KBE), “*it would appear that TA not only relies on, but thrives in, the context of knowledge-driven innovation*” (van Oudheusden et al. 2015: 22). It is thus positioned and it positions itself as a decisive knowledge producer in the KBE: “*TA actors must render clear to policymakers and innovation actors TA’s credentials as a decisive knowledge player*” (Van Oudheusden 2015: 25). Evidence for this can be found in the discourses about the economic mission of TA that were identified above. Hennen and Nierling (2015) also stress the outgoing contextual conditions that have changed drastically compared to the 1980s where early-warning TA functions were launched in a rather technology-adversarial period marked by strong civic engagement and technological controversies. Nowadays, the focus has shifted to rationalization of the STI system and economic redeployment, which in the concrete Walloon case translates in formulations such as: “*make use of participatory methods and function as an exchange discussion platform for constructive social debate on technological options **without being an obstacle to technological development***” (Kapompolé et al. 2008 – our translation, emphasis added). The idea nowadays is to anticipate controversies and constructively act on the social acceptability of technological developments. The proactive idea shifts the meaning of public participation away from protest-based participation to invited participation (Bogner 2014a & 2014b).

The co-production of regional(ist) TA is the third phenomenon in which TA is intermingled. Another *de facto* alignment to be observed is the progressive narrowing

down of TA around the political territory of the Region (instead of the Community). The idea of integration of the Walloon Region and the French Community (their Parliaments and Governments) as both addresses of the TA unit was progressively abandoned to the profit of a solely regional institute. This happened with unintended support from SPIRAL – mainly for practical reasons. Indeed, in the period during which this TA dossier remained unsolved, SPIRAL researchers often referred to TA in Wallonia out of simplicity and not to complicate this too much with the international interlocutors. Also in their mobilization activities and pilot projects they refrained from too many activities in relation to Brussels because that would potentially make things more complicated (on the community level, Brussels is shared between the French- and Flemish-speaking Communities but is also a Region of its own). Lastly, it seemed clear at some point in 2014 that the struggle between Marcourt and Nollet concerning TA for the region *versus* TA for the region and the community had been won by the former. Therefore, SPIRAL did not engage in repoliticizing this issue and took TA as an institute for the Region for granted. Compared to the temporary blockade between the two ministers formerly in charge, the project has now become totally regionalist: the institute is supposed to be integrated in the Walloon Parliament. The Board should be composed mainly by regional actors (with the exception of the community-based ARES, which appointed members would still need to be approved by the Walloon Parliament and Government). The competences it touches upon are more concerned with applied and economy-oriented research and innovation and do not necessarily apply to the more basic research program of the community. The French Community as well as the Region Brussels-Capital are not totally rejected, but the proposal makes clear that they would have to financially contribute if they wanted to commission the institute with a project. In this regard the regionalist view of Marcourt has won over Nollet's ideas of further integration between Region and Community. These views are notably grounded in regional (territorial) innovation theories, which additionally reinforce the KBE narrative mentioned above.

Fourthly, the recent TA project potentially co-produces new publics and a new understanding of (civil) society and its participation in policy-making processes. The paradigm shift of social-concertation TA towards EPTA-like and participatory TA coincides with a different view on society and its integration into policy-making processes. The TA mission at the CPS tapped *“into a political culture that emphasizes the importance of concerted social action. In Belgium, collective bargaining between trade unions, employer' organizations, and governments is an important political and social tradition that allows TA practices to gain firm foothold in multi-layered, consociational democratize (Lijphart 1977). [...] Seen in this way, TA can arbitrate between scientific, political, and social worlds”* (van Oudheusden et al. 2015). Valenduc additionally stresses that despite the fact that *“consultative councils [such as the CPS within the CESRW] have a series of handicaps (slowness of procedures, limitation of centers of interest, bureaucratic*

functioning and a minimal impact on media and the general public), they however also present several advantages compared to the more punctual and informal forms of consultation: they are permanent and benefit from an institutional support, they are integrated in official procedures of consultation; they can evaluate policies on the longer run” (EMERIT 2003 : 1 - our translation). Also, the main advocate in Wallonia at the time was FTU (Foundation University and Work) - a research center close to the labor movement of the christian pillar. In other words, for the second phase of TA institutionalization the neo-corporatist social concertation influenced the knowledge that is produced by favoring consensual topics and approaches. This was clearly in line with the objectives of creating an innovation friendly social climate. The current shift towards a citizen- and stakeholder-based participation also operates a change in the institutionalization and the kind of knowledge produced. Long-term and embedded consultations may progressively be replaced by punctual and project-shaped participation, without clear and permanent link to decision-making arenas (Bogner 2014a & 2014b). Moreover, public debate mediated by neo-corporatist bodies aimed at balancing out pre-defined interest groups (workers vs. employers) whereas the current understanding of public participation gives way to more pluralistic and overall constructionist view of publics that are constituted by the issue (Callon et al. 2001, Marres 2005) and needs to be interested (Callon 1986) or actively recruited according to pre-established demographic criteria. Several actors highlighted that the process of institutionalizing TA gave rise to new and original working modes (especially during the working lunches) for instance between majority and opposition, between government and parliament, beyond the narrow focus of specialized commission or in terms of interactions between researchers and policy-makers. These relations are less characterized by bureaucracy in parliamentary procedures, less antagonist along traditional ideologies and more consensual positions in today’s discourses about TA in Wallonia.

Those different co-productions of knowledge and social order are at the heart of the current proposal of an EPTA-like, single, specialized and dedicated TA organization. Nonetheless, we also find a series of indicators hinting at a more networked, distributed, less formalized and territorially bounded idea of TA. They notably build on the idea of “*évacuation des choix technologiques*” developed above, i.e. that similar or equivalent approaches, competences and knowledge are already there and distributed across different levels of power and multiple organizations. Furthermore, they embrace the idea of further debureaucratization and having less formal working modes (such as pilot projects for instance). These (minority) alternative discourses about TA are based on the idea of a distributed and networked organization and knowledge production via “transportability of knowledge” and “secondary analysis”. As for the 3rd generation, this possibly emerging 4th generation also co-produces a certain type of knowledge and social order. This point will be further developed below.

7. Alternative discourses: A possible fourth model around the network idea?

The current apparent coalition of scientific and policy actors is essentially made up by the PACITA project, the SPIRAL research center, the former Government (in particular the Ministers Marcourt and Nollet and their cabinets) as well as a series of parliamentarians of the working group and the former president of parliament aligns behind a particular understanding of TA. First, this model is clearly inspired by existing organizations and members of the European Parliamentary Technology Assessment (EPTA) network. Recurring references are made to particular member organizations and there is a strong will of Walloon TA promoters to integrate that network. In this sphere, a TA organization is conceived as one central (or centralizing) organization operating on a defined political entity (country or region) notably by (at least) addressing its parliament. It is specialized, meaning that the TA activities are clearly identified as such with dedicated resources and structures. Among the diversity of institutional models coexisting within the EPTA members, the Walloon coalition is particularly interested in remaking an “interactive” model (Hennen & Ladikas 2009). Contrarily to the “committee model” or the “parliamentary unit”, which only provides information to the Parliament, this particular organization form has the additional task of stimulating public debate and includes the government amongst its addressees. This results in a certain independence from Parliament, for instance by a more pluralistic board composition.

For a number of reasons, the 2014 decree proposition has not yet been voted and even less executed. Under the present term, the Walloon government does not mention TA anymore in its policy programs. The Marshall Plan 4.0 however uses the term “Strategic Intelligence”. Rip (2012) has already indicated that such term may take over TA in a more encompassing nebula of practices (foresight, evaluation, TA). The working group in Parliament has also not (yet) been reinstalled.

The present section aims at highlighting some locally grounded critiques of this model and identifying incipient elements of alternative propositions and remakings. Some of the presented elements are particular to the latest proposed model (the third phase of institutionalization), others are recurring considerations about Technology Assessment in Wallonia, independently from a particular phase of institutionalization. Critiques address the ideal of specialization, centralization, the regional/national scope and the idea of an organizational institutionalization. Counter propositions are inspired by distributed and networked practices in already existing settings and/or in practical reflexes. Furthermore, it is expected to profit and reduce costs by relying on ICT-enabled tools and portable data produced elsewhere. They show similarities with the emerging literature on networked TA without making explicit reference to it.

A first element challenges the organizational specialization and goes back to the online Delphi results of 2008. An important number of respondents did not favor the creation of a new entity, which would, according to them contribute to additional institutional complexity in the STI landscape. Subsequently, these participants favored the integration in an existing organization's context. This element is regularly reoccurring in the debates about TA, especially but not exclusively when TA is presented to a new audience.

A second element contests the centralization of the EPTA model. This is for instance the case when interviewees point to the existence of TA-like activities in Wallonia and highlight their distributed character. Mentions are made to the technological foresight mission with the (former) technology stimulation Agency or propositions to reinforce human capacities of administrations such as the Directorate for Technologies, Research and Energy (DGO6). Reference is also made to international actors and organizations that may be relevant to the Walloon context. Given all these distributed competences and activities (notably in university research centers), contestants will *ad maxima* argue in favor of minimalistic apparatus (Warrant 2008) at the disposal of the Walloon parliamentarians in search for relevant expertise. *Ad minima*, they reject the need for such a centralizing structure. Moreover, the argument goes that these distributed competences are embedded much closer embedded to the real decision-making arenas, where the distributed technology development is actually happening. This idea implicitly refers to the idea of intermediate bodies (van der Meulen and Rip 1998) of STI governance and mid-stream modulation (Fisher et al. 2006). Here, assessment activities are no longer concentrated at the centralized and top level (of parliament for instance) nor at the upstream level (early in the policy programs and enabling mechanism) but in distributed settings at the mid-stream level of technological developments, in research centers, labs, administrations and other science and technology enactors. The idea has gained more prominence with the new innovation and creativity approaches promoted by the Walloon government in the last years. In other words, this idea of distributed TA (Sadowski & Guston 2015) claims to be connected to "*decisive points in the R&I process - one could think of integrated or constructive TA early on in the R&I process*" (Hennen & Nierling 2015: 6).

Another variation of this distribution idea that challenges the organizational specialization and centralization is found in the discourse of some MPs, when they state they already "use" TA in their everyday work. As if they would 'naturally' adopt a more "holistic" view on things and for instance automatically think about the implication and consequences in their parliamentary activity. This idea links up with notion of "reflex" in the understanding of institutionalization. Following this idea, TA would then become a sort of mental disposition, an attitude to which one can become aware, perhaps trained

but one that the MPs can do themselves. It further vehicles the idea that TA can be done informally and does not necessarily need trained practitioners, thorough methodologies and dedicated resources nor specialized institutions. This idea links up to the resistance some MPs expressed towards an institution supposed to “enlighten” them (and proposed by the government). They opposed their own legitimacy based on universal suffrage (everybody can become an MP through elections) to the perceived imposition of competence or qualification in certain subjects and topics that TA would operate (Eerdeken 2009).

A third reserve targets the ambition of a possible Walloon TA, thereby contesting the idea of one organization per country/region and the corollary deficit description (see chapter 2). An interviewee from the public administration puts in balance the relatively small size of the Region and the international character of technological developments by referring to the example of nanotechnologies which seems too big for Wallonia: *“a small region like Wallonia does not have the resources to engage in broad questions such as nanotechnologies. Instead TA in Wallonia should focus on local issues and applications (such as geolocalization and traffic).”* According to this interlocutor, Wallonia should not work on all possible socio-technical issues. For instance, nanotechnologies are cited because their development is considered as too international and Wallonia could neither afford to originally work on it nor tangibly influence the trajectories of these technologies. Accordingly, TA in Wallonia should concentrate on technologies that are particularly relevant in the regional context and where public authorities can have an impact. Other interviewees elaborate further by saying that in the face of such international technology developments, technology assessment needs to be international as well. Consequently, Wallonia should participate in international TA efforts but this kind of discourse does not see a real need for TA at the regional level.

A fourth strand of criticism challenges the idea of institutionalization itself (in the sense of specialization, centralization and thus the one organization per country/region rationale). Valenduc and Vendramin (2006) reacted to Delvenne & Brunet’s (2006) publication in *“Le Courrier hebdomadaire du CRISP”* comparing different European TA institutions and identifying a deficit of organized TA in Wallonia. In their response paper, they welcomed the renewed interest in TA by a new generation of scholars and stressed that TA remains highly pertinent but proposed to redirect efforts for TA in Wallonia in another direction. Instead of concentrating on the institutionalization issues (and their respective success or failures), the authors propose to evaluate the conditions and factors of success for TA. Those would require a closer look at political debate culture, interdisciplinary expertise capacities and situated forms of engagement. Finally, they became more concrete on the organizational plan proposing that *“more flexible institutional forms (networks of expertise, permanent forums, etc.) are worth being explored once again where parliamentary TA has failed to come through. Such forms*

would be more in phase with the new organization forms of knowledge production..." (Valenduc et Vendramin, 2006: 3, our translation). Following a co-productionist approach, we see here again how organizational patterns in the field of knowledge production such as networks and forums also became constitutive of a political project of installing TA and its respective organizational forms. The idea has a certain recurrence and during a debate in the framework of the PACITA project, another participant put forward the idea of a TA that would be *"less structured around organisms but rather networks of actors that collaborate in certain technological questions given the complexity of S&T matters and the difficulty for a sole organization to handle them"*. Thus hinting a case-to-case handling of arising TA issues on a project basis, which produce a new network of actors each time.

Fifthly, the idea of "project" is sometimes put forward alone or associated with the idea of network organization (see Boltanski & Chiapello 1999 for a theoretical discussion on how project and network tie up together). The notion of project reveals a productive polysemy: it refers to an on-going objective one aims to achieve (the project of installing a TA organization) while at the same time crystalizes as temporary organizational form (Bakker 2010) or realization (conducting a TA project i.e. a study). Pilot-projects for instance are mentioned several times as a way forward for the institutionalization and is supposed to deliver proof of concept both in terms of what TA can deliver (its process and outputs) and how it works (its organizational embeddedness). Ideally an ex-post evaluation should bring about insights for fine-tuning the organizational settings, working procedures and communication formats. However, some recent declarations insinuate that the project form of doing TA could become a permanent status. TA would be conceived as an accumulation of ever renewing projects. In the present case this argumentation was brought about by some MPs insisting on the fact that TA should remain flexible, that yet another pilot-project was necessary. As a result, TA risks becoming increasingly perceived as a succession of projects, which are limited in time and each time mobilizing a new network of experts or publics.

Sixthly, some MPs regularly advanced the idea of profiting from TA work, this being done by other European institutes, notably to save costs and to resort only to minimal capacities. They hope that EPTA membership will be useful in that regard. This conception is grounded in a certain idea of transportability of methodologies, data, results and recommendations. The ideas of portability and by extension the search for hard and fast (we could add cheap) data neglect the "encultured" character of this knowledge. It is however constitutive of some of the proposed networked approaches - both internally (just gather the available national or regional expertise and bring it to policy-makers) or internationally (just translate and profit from the work being done elsewhere). For the latter, SPIRAL was also very attentive to include the legal possibility

in the decree for the institute to participate in international and European projects⁷⁵. Paradoxically (or even ironically), during the working lunches the MPs received the least favorably a foreign TA study, which was presented to them. Most participating MPs insisted on cultural dimensions of the project proposal presented by the Dutch TA practitioner which could not straightforwardly be transported into the Walloon context. According to them, the framing and topic did not fit the Walloon culture and thus the findings would be of little use to the regional decision-makers.

Seventhly, critiques of the third institutionalization phase refer to a number of expectations raised by ICT-enabled innovations. Policy-makers and TA practitioners sometimes envision a virtualization of TA. Inspired by e-governance and e-participation, these hopes comprise a nebula of practices and structures such as online repositories, libraries, project workflow management, sharing methods, data and results. In that regard Valenduc (2007) is puzzled that a cyber-TA hasn't emerged yet since it potentially offers a wider and more targeted diffusion of data and results and improved the possibilities of consultations and preparation of societal debates.

To sum up, discordant and alternative voices to the EPTA-like (one specialized organization per country/region) and the interactive model (using participatory methods and informing policy-makers in parliament and government) propose the following elements:

- Organize TA in existing institutions or capitalize on already existing practices;
- the organizational form of TA should be the network in which practices are distributed and synergies created among several existing actors;
- TA does not need to be regionally or nationally bounded but rather cross-national or international from the outset;
- the expected knowledge production should be regionally/nationally and internationally portable, "hard and fast", cheap and "uncultured"
- the exchange of knowledge as well as other exchanges and working modes could be assisted by ICT-enabled tools and innovations;
- the network is closely tied to, and enacted through, a succession of isolated and temporal projects.

The move from the third to the fourth generation of TA in Wallonia attest a simultaneous shift in the way governance and knowledge are conceived. The third generation conformed (had strong affinities) with the kind of participatory TA promoted

⁷⁵ From informal discussions within the PACITA project, we learned that some national TA organisations are legally not allowed to participate in activities funded by the European Commission because of sovereignty issues and separation of powers when accepting money from the European executive branch. This prevents them from access to fruitful and relevant networks of international TA activities.

by PACITA and its self-conception of most evolved practices and institutionalization. The project was already entrenched in multi-level, multi-actor governance because of the federal structure of Belgian policy. In addition, a relatively broad board composition of Science, Technology and Innovation stakeholders was envisaged and the possibility for participating in European projects was foreseen. Knowledge was understood as encultured and post-positivist. It was knowledge for action and not necessarily generated by scientific means but also fueled by social debate. Local peculiarities in problem framing and research results were highlighted and valued in many occasions.

The fourth generation operates a paradoxical shift with regard to this evolutionary conception. While the multi-level, multi-actor governance idea is developed further, the knowledge conceptions gets progressively **uncultured** and **decontextualized** with the idea of cheap and/or international knowledge transfers.

8. Case discussion and intermediate conclusion

We have identified three succeeding, partially overlapping periods of institutionalization and tried to describe the nature of the institutionalization process and the paradigm it evolves in. Those models of TA are rooted in particular contexts made up of socio-economic structures, science regimes and forms of civil society mobilization. At the same time, they always convey both conceptions of scientific activity and knowledge-production as well as social order and politics. Besides the latest, third model pushed by the above-mentioned alignment of actors, and given the inconclusiveness of that third attempt at institutionalizing TA in Wallonia, we may be witnessing a paradigm shift with the emergence of a fourth paradigm of TA around the network concept.

During the first period from the mid-1980s until the beginning of the 1990s, in the wake of both the creation of the first European TA offices and the Flemish evolutions, there were uncoordinated and hesitant approaches to TA at federal and regional levels. A second period, from the mid-1990s until the beginning of the 2000s, corresponds with the formal institutionalization of a TA mission at the Science Policy Council. TA at the time was in line with other regional TA missions inspired by social concertation and developed significant traits of an epistemic community in that regard. The third period is the period analyzed in more detail here and it focuses on the creation of a parliamentary TA organization similar to what exists in the European EPTA network and more particularly institutions informing policy-making (both parliament and government) and having a mission to stimulate public debate. We have shown how this new model co-produces an alternative vision of civil society, is tied to a regionalist program, procedurally and symbolically reinforces the parliament and lastly relies and

facilitates the advent of so-called knowledge-based economy. For a number of reasons, this project has currently lost some of its momentum.

One (easy) explanation would be to interpret the present closure of this opportunity window as simple episodic drawback, a “lack of political will” or failed institutional entrepreneurship, which could be understood both in terms of inadequate actions and systemic resistance to institutionalization. While these explanations probably capture part of what is happening, they also remain quite black-boxed in the circle of daily politics to which it is hard to gain access. We suggest that there lies only half the explanation for the current situation. Alternatively, we propose to identify some representations and expectations that are not in total accordance with the compromises and pathways taken by the third phase of institutionalization.

One such alternative view of the current developments and remakings proposes to see this loss of momentum as a sort of decline of this third phase which analytic explanation goes beyond the simple closure of a window of opportunity. At least it attempts to identify elements, which could be constitutive of a fourth phase of institutionalization. The key concept that characterizes this particular process of institutionalization would be the *network*. This network paradigm has more or less recently gained attention from scholars and institutional entrepreneurs in other places where the future of TA is equally at play. TA thus becomes yet another venue where the network concept becomes both an analytical concept trying to capture actual developments while at the same time being an injunction that inspires appropriate action in the contemporary context⁷⁶.

Several authors tried to theorize a new network model of TA “as a step forward” (Hennen & Nierling 2015: 6) in contexts where resources are scarce (Böhle & Moniz 2015 for Portugal; Ely et al., 2011, 2014, 2015 for developing countries), the TA concept not yet widely known and accepted (Leichteris 2015 for Lithuania and other central and eastern European countries), or where former institutionalization forms have failed (Sclove 2010; Sadowski and Guston 2015 for the post-OTA USA or Yoshizawa 2016 for Japan).

Accordingly, we have also identified voices in Wallonia that are tempted by a networked approach of TA – favoring platforms and other administratively and financially light solutions or organizational forms that do not follow a dedicated and centralized

⁷⁶ Moreover, the boundaries between the network theories and the network entrepreneurs are blurry and influence one another: network theories in STS for instance have emerged from sociological inquiries into the connections between humans and non-humans (Callon 1986) or the observation of laboratory activity (Latour 1987) while at the same time STS theories as well as information or cognitive sciences bringing about the network concept have inspired entrepreneurial action or public administration (Politt & Bouckaert 2011).

approach bounded to a country or a region. However, at the current stage, they remain a collection of minority, disparate and sometimes unarticulated discourses and statements. The systematization of this phase is our conceptual elaboration and it is inspired by the above-mentioned literature. The network model is either a *de facto* reality tentatively theorized by analysts (without necessarily an intention from the actors involved in the institutionalization process) or in a proposition stage that still needs to prove its viability (Hennen and Nierling 2015). The understanding of the network idea of institutionalization is still open for a lot of polysemy and not without its own paradoxes. Indeed, sometimes these views are incompatible and the only common denominator is a certain critique or reserve towards the previous phases of institutionalization. Therefore, we argue that the proposed networked approaches should be considered as part of a continuum between specialized, national glass and concrete TA (Ely et al. 2011, 2014, 2015) and purely networked, transnational and project-based TA. Analysis of existing TA institutes (particularly the interactive models) would almost certainly identify elements of the network forms of organization or hybrid constellation of the two as well.

Nowadays, the international TA community generally accepts the impossibility to transfer readymade organizational solutions in other national and regional settings (Hennen & Nierling 2015, Ganzevles et al. 2015). Reference is often made to failure of narratives with regard to such transfers (cf. the criticism the OTA model received end of the 1980s in Wallonia, and the impossibility to transfer the OTA model anywhere else than the US even though it was always immediately envisioned, see Delvenne 2011). The current consensus emphasizes the importance of finding locally tailored organizational solutions that acknowledge the socio-cultural dimensions of an individual TA organization and the necessity to be grounded in a given institutional landscape, a particular political culture and civil society organization as well as a given science regime.

Having abandoned this myth of transportability and transferability of organizational solutions by acknowledging their “encultured” and local character, it however gives way to a new aspiration: the portability of projects. In this new myth, the cultural dimensions of issue framing, methodological choices, data produced and deducted recommendations are downplayed or ignored. Driven by the logic of cost reduction and the expectations put into ICT-enabled innovations, the idea of translating, adapting and profiting (sometimes as a free rider) from work being done elsewhere has gained prominence. This “myth” is conjugated in two complementary ideas, which we also find in the discourses of established TA organizations. The first one refers to the necessity and added-value of conducting so-called cross-national TA projects (Peissl & Barland 2015). Such undertakings are said to better fit to the actual transnational socio-technical developments and at the same time present the advantage of reducing costs via

economies of scale. The second complementary idea refers to secondary analysis. Accordingly, it would be possible for a smaller, lighter TA unit to rely on the data gathered by other offices so to avoid unnecessary duplication of work and the associated costs.

Waterton and Wynne (2004) have shown that the “hard and fast”, positivist, harmonized, standardized and “uncultured” data provision co-produces a centralized and hierarchic idea of the state. On the contrary, the acknowledgement of “encultured” and local knowledge in more experimental and subsidiary governance modes is notably characterized by distributed settings of knowledge production. Paradoxically, in the case of Wallonia the first vision of “hard and fast” data allies in an original way with the idea of networked and distributed form of organizations and knowledge production. Contrariwise, following Waterton & Wynne, the latter should, at least theoretically, be more suited for a post-positivistic conception of knowledge. This idea of harmonized and universal TA knowledge to serve multiple governance actors is widely shared by TA practitioners and advocates today. As we will see in the next chapters, the Portuguese TA network GrEAT is currently busy with exhaustively compiling available TA studies from the deceased American OTA as well as organization in the EPTA network and aims to put them at the disposal of parliamentarians. On the European level, a consortium of TA and Foresight institutions have introduced a project proposal (VIADVICE) that particularly aims at increasing the capacities of national/regional organization to exchange experience and data, facilitated by on-line mechanisms. A major idea behind such a constellation and mode of collaboration is the cost-saving dimensions and experience exchange. One may wonder what social order is co-produced along with such a new way of knowledge production.

CHAPTER 4 - Networked TA caught up in the linear model of science parliament relations? How the economic crisis and consensus politics in Portugal rally TA behind evidence-based policy-making.

1. Introduction

This chapter is a case study on the current efforts to institutionalize technology assessment in Portugal. It starts by briefly exploring the history of science, technology and innovation governance in Portugal and identifies the present and past actors in the field of TA. Since a parliamentary resolution about Technology Assessment in 2009, a series of additional efforts have been undertaken in the Portuguese Parliament (reports, hearings, debates, etc.). These efforts have brought together a diverse range of scientific experts and parliamentarians, which mainly converged around the primary issue of finding the best organizational form for TA in Portugal.

Although the models proposed in the beginning are similarly pointing to a so-called Parliamentary Unit, the strategies to promote TA differ substantially among actors. To varying degrees, the two main groups involved in the promotion of Technology Assessment invest in creating relational expertise as opposed to realistic expertise. They also perceive their own role differently as to the provision of TA knowledge to policy-makers. The MPs, on the other hand, discuss feasible organizational options in the wake of severe budgetary constraints.

Both Members of Parliaments and TA experts have invested the existing taxonomies of TA models as boundary objects while maintaining a consensual goal characterized by a science-for-policy approach with mutually assigned and accepted roles of scientists and politicians in an “evidence-based policy-making” framework. Pre-existing taxonomies of TA organizations get reinvested with new meanings that selectively highlight, occult or blend traits of the referenced models to fit contextual peculiarities as well as strategies and interests of different promoters. In the face of budgetary austerity measures, the exact organizational configurations have been revisited on several occasions in order to conform to financial restrictions. The latest proposal to date foresees a pilot phase for a so-called “independent” model of TA (external to Parliament) accompanied with a digital library for Technology Assessment within the Assembly of the Republic.

This is reflected in the understanding of the «independent” model, which in this case emphasizes the external funding and actual outsourcing of work rather than the mission to stimulate societal debate. Original elements include possible partial privatization and

crucial reliance on virtual infrastructure and knowledge imports. The remaking of TA in Portugal not only concerns the limits of what could still be considered an “independent model”. It also sheds new empirical light on the envisioned new generation of TA around the concepts of transnational networks, cooperative projects and on-line infrastructures. Our discussion sketches that under the particular framework conditions in Portugal such networked model may not fully live up to its claimed reflexivity or opening-up. On the contrary, it runs the risk of reproducing early conceptions of Technology Assessment grounded in evidence-based approaches and a linear conception of the relation between Science and Society.

2. Methodology

The present case study is based on first and second hand, mainly qualitative, data. The first hand data was gathered directly during a two-month research stay in Portugal (mid-April – mid June 2014). It includes the transcription of 23 semi-directive interviews (see list of interviewees in annex) as well as field notes from informal discussions with some key informants of TA in Portugal and observations gathered throughout the participation in different activities of the PACITA project (internal workshops, consortium meetings and more informal exchanges during those activities). The interview grid addressed elements such as (a) Personal involvement in Portuguese TA activities or their promotion (teaching, research, political advocacy, debates etc.), (b) Reconstructing the history and particular TA-relevant events and mapping actors, positions and discourses in relation to TA in Portugal, (d) Discussing elements of political and scientific culture in order to develop a greater understanding of TA in the Portuguese context. The participant observation adds an additional layer of ethnographic work to the data gathering process. This involvement continues today, notably by following the different actors and their TA-related activities on social media and maintaining direct contacts (via email and/or videoconferencing) so as to keep up to date with the recent developments since the on-site research stay in 2014.

The second hand sources consist of analytical material or grey literature (such as reports, presentations, minutes from parliamentary hearings, scientific articles, etc.) that have been identified through desk research or been produced or referenced by the interviewees. These sources have helped us to qualify and theorize certain aspects and situations of TA developments in the country⁷⁷.

⁷⁷ A major part of the documentation about science policy is produced by actors having a stake in science governance, if not directly in the development of Technology Assessment. Several authors of mentioned reports have double roles of researchers and policy advisors if not political or institutional entrepreneurs. Some of the highlighted characteristics of the STI systems or the TA activities can be suspected of favoring particular

Given our exteriority to this fieldwork and the sometimes inextricability between analysts and informants⁷⁸, we opted for a thick description approach (Geertz 1973) where the attention to context intertwines descriptive and analytical processes. Concretely both feed on the interplay of those second hand sources completed with first hand collected data (transcribed interviews and fieldnotes from observations). Second hand analytical sources are therefore only mentioned when they seemed to fit what has also been observed empirically elsewhere or to gain additional contextual understanding. Following Jasanoff (2004) we propose to shift “*from fact-making (the traditional preserve of much work in science studies) to sense-making as a topic of overarching interest, with scientific sense-making as a particular, if highly significant, subcategory. It brings society’s collective habits of interpreting and ordering experience within the perimeter of scholarly inquiry*” (Jasanoff 2004:276). In addition, successive versions of this thick description have been submitted for validation to some of the main (scientific) actors in the active in the TA field⁷⁹.

3. The national context: from the democratization of Portugal to the first TA-like activities

For a period of nearly 50 years (1926-1974), Portugal experienced a dictatorship that has been described as “*hostile to science, towards a generalization of access to education and the promotion of critical thinking*”. (Hagedijk et al. 2005: 60). Science in Portugal

courses of action. Nonetheless, these information are of value in a comprehensive account of the history and current development of TA. Indeed, they respond to the perception and cognition major actors have of the situations and ground their action and strategies in according understandings/rationales.

⁷⁸ For analytical purposes, the interviewees were grouped into three main groups of actors, which were sometimes connected or even overlapping. However, for clarity, the groups will be presented separately here and connections between them will be addressed at a later point. These three groups are (1) the GrEAT (Research Group on Technology Assessment) network and the people around sociology Prof. A. B. Moniz, including the PhD program on Technology Assessment (PDAT) he coordinates; (2) the Technical Institute of Chemistry and Biology (ITQB) as Portuguese partner in the European project Parliaments and Civil Society in Technology Assessment (PACITA) around the national coordinator Dr. M. Almeida; and lastly (3) a series of Members of Parliament and auditioned experts within the Commission for Education, Science and Culture (CECC) of the Portuguese Parliament. Although these three groups each present a certain level of heterogeneity, they will, if not otherwise specified, be mostly presented as a coherent group of people and discourses committed to a particular cause.

⁷⁹ This includes a presentation at to the GrEAT network / PDAT students as well as a seminar at the Centre for Social Studies (CES) at the University of Coimbra in the presence of the ITQB affiliate in charge of the PACITA project.

was characterized as semi-peripheral⁸⁰ and “*weighted down by social and cultural factors such as the restrictions of Catholicism, the persistence of low literacy levels well into the late 20th century, an authoritarian regime that distrusted and repressed scientists and barely invested in scientific research, and an economic fabric that relies little on innovation and technological development*” (Delicado, 2013).

It was only after that period of dictatorship ended that the country started to really develop a science and technology policy. “*The revolution of 1974, promoting an abrupt breakdown of the established pillars and connections of the previous regime had a strong impact at the societal, political, organizational and cultural level*” (Gonçalves & Caraça 1987). In Science Policy, this development occurred mainly through the reorganization of the National Board for Scientific and Technological Research (JNICT) and with the support of European (structural) funds after the country joined the European Union (European Economic Community at the time) in 1986.

With the growing influence of EU funding, the Portuguese word *avaliação*⁸¹ started to be used increasingly as well. EU programs have proven to be a strong driver of TA-related activities in Portugal throughout the last 20 years. As a matter of illustration, from the 1990s on, Böhle & Moniz (2015: 33-34) mention programs like TSEAR (Targeted Socio-Economic Research, 4th Framework Program), “*the European Technology Assessment Network (ETAN), the MONITOR program, with subprograms like Forecasting and Assessment in Science and Technology (FAST), and Support of the Evaluation Activities of R&D Programmes (SPEAR)*”.

⁸⁰ Different authors mentioned in this chapter use this term and often do not explicitly define their understanding of center and periphery (and semi-periphery). The concept was initially coined in Wallerstein’s world-systems theory (see i.e. 1974 or 2004 for a synthesis in French). Shared traits of this literature include a general dependency relation between the more advanced (capital intensive and high labor costs) core and the periphery, which lags behind (less capital intensive and lower labor costs). The semi-peripheral condition is an evolution of this thinking. It implies intermediate levels of dependency, possibly being applied to different scales such as continents, regions or countries. Santos & Nunes define semi-peripheral countries as “*countries occupying an intermediate position within the world system in terms of levels of development as measured by conventional standards such as those used by the UN, and located in different regions of the world*” (2006: 2).

⁸¹ A preliminary note of caution needs to be added at this point. Like in French (see chapter 3), in Portuguese, there is no direct translation for the term “technology assessment”. The term “*Avaliação de Tecnologia*” is commonly used for its English equivalent. However, “*avaliação*” translates equally in two different ways – into evaluation and assessment. During the interviews, which were partly conducted in English and partly in Portuguese, the interviewees used different terms to speak about TA – some in order to be more specific (such as “*social evaluation of technology*”, “*technological evaluation*” “*parliamentary technology assessment*”, “*participatory technology assessment*”), others in order to address more broad or loosely defines realities (referring, for example, to “*foresight*”, “*prospective*”, “*planning*”, “*science policy*”).

Originally science policy has been firmly in the hands of the executive branch. This is also where initial reflections about Technology Assessment emerged and the first TA-like activities took place (in specific units in the administration and in state laboratories). The first use of the term “technology assessment” in a Portuguese publication dates back to 1987. Gonçalves and Caraça used the term for an international audience at the second European Conference of Technology Assessment in Amsterdam. At the time of the publication, the authors describe TA activities as distributed and in a “proto-institutionalization” phase. The concept as it was conceived for the Portuguese context is furthermore described as “*blend of the traditional meanings used in both developed and developing countries*” (1987: 7). More concretely, this means that the historical identified proto-TA activities are both concerned with assessing foreign technology transfers as to select “*the most expeditive and less risky way of innovating in the short term [and] managing technology objectively, towards goals that contribute to societal benefit and to quality of life as well as to the economic well-being and creativity*” (Gonçalves & Caraça 1987: 7). As the authors did not study the role of particular governmental actors nor parliament or other societal actors, they called for further research on the receptivity and resistance towards the concept by these different spheres.

The first foresight and evaluation activities that took place at the JNICT were overall concerned with creating a strategic science policy and priority setting. However, these activities were concentrated among a limited number of experts and received only a very modest reception among policy-makers. As JNICT’s work was rather interdisciplinary and transversal, and simultaneously involved several administrations, most ministers at the time feared TA would interfere with their policies. When interviewed, Caraça also acknowledged that there has been a huge gap with a lack of transversal R&D activities in Portugal since the 1980s. Indeed, R&D was sectorally divided, with “*the national budget for science and technology [being] merely an accumulation of the R&D budgets for individual ministries*” (Gonçalves & Caraça 1987: 5). Subsequently, each Ministry had its own planning department. Studies continued to be undertaken after the restructuring of the JNICT in the mid-1990s into a specific Ministry of Science but these also failed to receive much political attention and follow-up. Policy-makers, especially in other ministries such as the Ministry of Economy, the Ministry of Education and the Ministry of Agriculture perceived those studies as threats, since they addressed issues of strategic definition of priorities. However, no especially dedicated office existed to carry out these TA-like studies concerned with planning, strategizing and evaluation. Interviewees point out the strong socio-economic impact dimension of

these studies. Environmental concerns, on the other hand, were not so predominant⁸². The socialist J. M. Gago became the first dedicated Minister for Science and Technology in 1995 (until 2002) and he later became Minister for Science, Technology and Higher Education (2005-2011). Gago worked towards the *“creation and consolidation of a national system of scientific and technological research, supported by public funding – a considerable part of it originating in European funds.”* (Hagendijk et al., 2005:60).

Until today, science policy and innovation policy in Portugal are being described as quite separate systems from one another (Almeida, 2012). On the one hand, there is the Ministry for Science and Education (MCE), which is responsible for academic research. The funds and policies for this ministry are administered through the Foundation for Science and Technology (FCT). On the other hand, the Ministry of Economy and Employment (MEE) is responsible for industry-based research and innovation. The agency responsible for implementing these policies is the Innovation Agency (AdI). The respective Parliamentary Commissions are equally organized along this dualism of competences.

Since Gago's terms, the predominant style of science policy can be characterized as *“policy-for-science”* with very limited *“science for policy”* (Almeida, 2012). In other words, there has been a *“science-oriented or science-led science policy, defining a limited number of stakeholders, [which] has as its underside the underdevelopment of science for policy, particularly in areas associated with (or likely to generate) public controversy.”* (Hagendijk et al. 2005: 60). Up to the economic crisis of 2008, Böhle and Moniz (2015) describe the innovation system, although highly centralized, as having undergone major improvement since the turn of the Millennium. While formal hearing structures of stakeholders exist, *“they have not been used often”* (Godinho and Simões 2014 quoted in Böhle and Moniz 2015) in the last years, especially in policy design and implementation. Indeed, several of the interviewees highlighted the fact that Gago was strongly convinced that science policy should be an exclusive prerogative of the executive power (i.e. the Government). He was therefore reluctant to pass over competences to Parliament in these matters but nonetheless initiated science cafés in Parliament under the *Ciência Viva* initiative (see below).

Up to this point, these TA-like activities are mostly uncoordinated and rarely explicitly refer to the TA label. From an initial focus on the consequences of technology transfers and the blended understanding of TA between developed and developing countries, TA-like activities in Portugal got increasingly caught up in efforts of strategizing and

⁸² With the exception of the particular project in the Ministries for geology and mines for the exploitation of natural resources, for which the Ministry for the environment for ecological impact assessments or the National civil Engineering Laboratory was concerned with hydro-electric dams (see Gonçalves & Caraça 1987:8).

prioritizing science policy. Moreover, some interviews even tend to use Technology Assessment and science policy as interchangeable. The mentality of risk avoidance and “*strong dislike towards change*” (Gonçalves & Caraça 1987) also gave way to a more innovation friendly climate. We will later address more specifically what rationales and expectations TA is invested with today. However, as we previously highlighted, these sorts of activities have happened mainly under the auspices of the executive branch. Opening those processes towards Parliament or other societal actors remains problematic and only started recently.

On a more analytical level, the way in which the governance of STI has been described in Portugal also pertains similarities with the way TA is currently being advocated. Previous studies have suggested that a “discretionary governance” model prevails in Portugal while other forms of governance, namely the “educational”, the “agonistic” and the “deliberative” model may be present to a lesser extent. Hagendijk et al. (2005: 17-19) define these four models as follows:

- Discretionary: The governance of STI mainly takes place within the few organizations directly responsible for science and technology policy with little input from civil society or the public. Governance is considered as the responsibility of the government, which is supposed to incorporate “*universal goals of progress, welfare and growth*” (2005: 17).
- Educational: This approach acknowledges the existence of conflicts regarding STI matters but frames them as emanating mainly from a knowledge deficit on the part of the public. In order to overcome resistance and “*create an informed public of scientific citizens*” (2005: 18), education and dissemination activities are organized.
- Agonistic: In this approach, STI is subject to strong contention with radically opposed positions. Although generally not frequently found within Europe, such manifestations can occur when decisions are taken “*in the face of heated public opposition*” and a “*loss of control of the state [...] as a variety of actors struggle for authority and influence*” (2005: 18). This style has been used to describe some local (siting) conflicts involving STI (e.g. the construction of dams or co-incineration plants).
- Deliberative: This is a somewhat idealistic and aspirational approach for participatory exercises. The assumption here is that public and rational debate with lay citizens will result in a consensus that will, in turn, improve and legitimize policy decisions.

These different governance styles will be evoked punctually in the following section when relevant. Since our research stay in 2014, the financial crisis acted as another significant game changer. The country is until today marked by the consequences of the

2008 financial crisis, which hit Portugal particularly hard from 2010 onwards. As a consequence of the bailout program, the country had to take severe austerity measures, which drastically limited the political leverage until today (at least until the last governmental coalition). Besides cutting overall public spending and downsizing the public administration, there is an increasing pressure for greater public accountability on public spending. As well will see, and as we might expect, this is not without consequences for TA (both in terms of resources but also justifications).

4. Mapping Technology Assessment Activities

The present topography of TA actors tries to set apart different groups and spheres of activities for clarification purposes. The main relevant events have chronologically occurred in a very little time frame (with a peak between 2011 and 2014, when the PACITA project allowed additional activities and fostered new relations between actors). Different strategies pursued by a plurality of actors and a certain lack of coordination between them however makes it difficult to tell a linear story, especially because a number of back-and-forth in the parliamentary process. The next section takes this complexity into account in order to reconstitute the chaotic institutionalization pathway that TA took in Portugal.

4.1. Scientific TA (-like) activities

Until recently, the academic TA-like activities were mainly to be found in innovation studies and STS (Böhle & Moniz 2015). Most of these activities take place in schools of Social Sciences and Humanities, Economics and Business Administration or Engineering. They encompass teaching activities as well as research. However, the academic sector is often portrayed as having a *“hesitant attitude in engaging with the outside world”* (Almeida, 2013) and as being reluctant to engage in technology transfers, joint projects with industry or the policy governance (Böhle & Moniz 2015). Nevertheless, there seems to be a shared understanding that a sufficient knowledge base, expertise and experience exist in Portugal for carrying out policy-oriented TA. In order to observe it, however, one has to explore a larger circle of activities that relate to TA – the so-called TA-like activities. Since the late 1980s, Science and Technology in Society (STS) studies represent a particularly useful area to look at in this regard (Gonçalves & Caraça 1987). The field has been extensively cartographed by Delicado (2013) and, as a matter of fact, it captures a good proportion of TA-like activities in academia.

Among the STS research that comes closest to policy-oriented TA one can mention the following: Firstly, studies on the scientific system have mainly undertaken quantitative investigation of the “*social and cultural structure of science*” (Delicado, 2013), measuring scientific outputs, mobility, funding, etc. Secondly, research on the relationship between science and society, which started with the scientific dissemination and deficit model of the public understanding of science⁸³ and only more recently took up the concept of public engagement with science⁸⁴. The third domain is constituted by risk analyses and notably case studies of “*the controversies generated by environmental risks and the interactions between science, policy and the public participation in the management of such hazards*” (Delicado, 2013: 135). Regarding the problem-oriented character or the social and political relevance of these studies, Delicado notes, “*The late development of science in Portugal, a lack of administrative tradition in resorting to scientific advice for policy decisions and a weak civic culture that hinders public participation were the backdrop to many of these studies, although the seed of change can be seen in many of them*” (2013: 135). In addition, the author mentions studies of the production processes of scientific knowledge with an emphasis on cultural patterns such as Portugal’s “*peripheral condition*” compared to the “*central countries*” where scientific standards are set. This post-colonial approach reveals another important and reoccurring aspect of Portuguese science policy⁸⁵. Furthermore, Delicado’s (2013) study also points out that the STS field lacks visibility at the undergraduate level and more crucially lacks institutional foundations (journals, associations and research units) and research funding comes mainly from two sources: the Foundation for Science and Technology (FCT) and the Goulbenkian Foundation⁸⁶. Only a few opportunities exist for post-graduate studies and they face a constant struggle in terms of audience and gaining access to funding⁸⁷. Moreover, STS academics are usually part of broader research areas or groups that deal with issues such as the environment, health, knowledge society,

⁸³ Public Understanding of Science (PUS) is often presented as an approach aiming to disseminate scientific knowledge so to foster greater acceptance among a public perceived as uninformed. (Schäfer 2009)

⁸⁴ Public Engagement with Science (and technology) (PEST) is considered a replacement of PUS (Science, 2003), i.e. a more recent approach that captures a variety of ways in which specialists interact with non-experts, may they be organized group or individuals, on the relationship between science and society (Schäfer 2009).

⁸⁵ As we will see later, the postcolonial account just spotlighted above also generates some effects on the visioning and expectations towards TA practices.

⁸⁶ The Goulbenkian foundation is a private, non-profit organization active in the fields of art, charity, education and science. <http://www.gulbenkian.pt/Institucional/en/Homepage> (consulted 7th of January 2016).

⁸⁷ At the Master level, two STS courses are available at the University of Lisbon, one in Economics and Management of Science, and one in Technology and Innovation. There is also a suspended Master in Science and Technology Studies at the University Institute of Lisbon ISCTE. In addition, the following PhD programs come close to TA: Engineering and Public Policy at the Instituto Superior Técnico (IST); the Foresight, Strategy and Innovation Program at the Instituto para o Desenvolvimento e Estudos Económicos, Financeiros e Empresariais (Idefe) at the Lisbon School of Economics and Management (ISEG); the Knowledge, Governance and Innovation program at the University of Coimbra (UC).

innovation or work. As a matter of illustration, at the University of Coimbra, and especially its affiliated research center CES (Centro de Estudos Sociais), there is a considerable history of previous TA-like projects (notably European) on Science, Technology and Governance (STAGE see Hagendijk et al. 2005), on Public Accountability in matters relating to S&T (PUBACC see Joss 2005), and on Science in Parliament (Pereira et al, 2010). Some of these studies have been carried out in collaboration with other European TA organizations such as the Danish Board of Technology (DBT) or the Rathenau Institute. The CES researchers identify themselves with so-called bottom-up and participatory approaches of Technology Assessment and are less involved in (effort towards) more institutionalized forms.

4.2. The PhD Program in TA, the GrEAT network and the TA observatory

In Portugal, the term “*technology assessment*” (Avaliação de Tecnologia) is itself only found explicitly in the “*Programa Doutoral em Avaliação de Tecnologia*” (PDAT hereafter) in the Faculty of Science and Technology (FCT) at the Universidade Nova de Lisboa (UNL). Shortly after the closely related “*Grupo de Estudos em Avaliação de Tecnologia*” (GrEAT) was created, followed more recently by the “*Observatório de Avaliação de Tecnologia*” (OAT). Although closely interlinked, each entity pursues slightly different objectives with regard to the development of TA in terms of education, advocacy, community building and research.

Firstly, the particular PhD program on TA is institutionally embedded at the Universidade Nova de Lisboa (UNL), in the Department of Applied Social Science within the Faculty of Science and Technology (FCT)⁸⁸ - a public science and engineering school. Professor A. Moniz, the founder of the PDAT, launched it in 2009 because he perceived that there was a need for a particular PhD qualification program on Technology Assessment. The program is related to the Innovation and Technology Studies research unit (IET) at CES.NOVA⁸⁹ (FCT/UNL).

The program is quite unique because of its focus on a formal higher educational approach and capacity building close to real world professional contexts. The first two (out of four) years of the program consist of classes on the economics of innovation,

⁸⁸ The Department of Applied Social Sciences (DCSA) is an interdisciplinary department that links social sciences with science and technology courses. It aims to complement a scientific and engineering education with skills of communication and expression, relationships between science / technology / society (history, philosophy and contemporary thought), and of ethics, organization of work and economics, management and entrepreneurship. The DCSA aims to prepare and encourage students to reflect upon their role in “complex issues related to the development of contemporary communities.” (<http://www.dcsa.fct.unl.pt/en/about> last accessed 25th of April 2017).

⁸⁹ Centro de Estudos Sociais at the UNL

history of technology, environmental engineering, participatory methods, (mathematical) methods of decision-making, STI policy evaluation, and foresight methods. The last two years are dedicated to the individual PhD thesis research. Most of professors are affiliated with FCT/UNL, with the support of a few external lecturers. The course also organizes a yearly winter school and a doctoral conference for students to present their work in progress to a scientific audience. Moniz has also invited people from outside academia to attend those events. A few MPs as well as members of non-governmental organizations (NGOs) have attended some of these conferences in the past. There is no Master's program to prepare students directly for the PDAT. Ideally, applicants should have work experience in addition to their degree. These students have had experience of decision-making processes regarding technology in their respective working environments (ministries, companies, hospitals, technology transfer offices, etc.). The funding of the PhD students participating in the PDAT is mainly coming from different national or foreign research funding agencies, private sponsors or on student's own resources. Besides the participants that have enrolled in the program with the (financial or other) support of their employer, there is no tradition of study requests from external actors. Most of the research is based on the individual interests of the researchers. Participants' expectations are mainly driven by the desire to improve the decision-making processes in their respective working environments as well as the desire to communicate about their work and make it policy-relevant. This is often combined with personal challenge and career advancement perspectives. The individual funding and the fact that it is PhD research (leading to an individual qualification), makes the research areas rather heterogeneous and the topics rather isolated from one another. The working perspectives after completion of the PDAT are presented as follows: *"The diploma offers a learning and research programme to skilled professionals that feel the need for other tools to define new possibilities in the technology decision-making process in their institutions. This can be seen in the fact that the PhD students participating in this programme are working in high-tech departments of large hospitals, in large technology-based companies, in specialized software firms, or even in statistical departments related to innovation policy. As mentioned before, many companies that deal with technology-related decision (investment firms, technology consultants, impact assessment analysts) will search for such TA diploma holders. The requirement for such expertise will also be evident in the public administration sectors related to energy or infrastructure systems, or to strategic planning in several fields. Larger industrial laboratories and scientific research centers will need TA experts among their highly qualified staff."* (Moniz, 2012b). Herein, one can identify here a broad spectrum of addresses and the ambition to correspondingly educate specialized TA professionals for various and distributed decision-making processes of STI governance in various fields, working environments and levels of power.

A bit later, the PDAT also gave birth to the GrEAT (*Grupo de Estudos em Avaliação de Tecnologia*) network. GrEAT started within the PDAT, with which there is a considerable overlap, but it soon grew to include wider circles of researchers with the objective to bring together a number of scientists working in fields close to TA but where TA is not at the core or explicitly referenced. It aims at linking these scientists in order create more focus and attention explicitly on TA and further disseminate its concepts and methodology to a wider range of actors. By doing so it tries to gather a critical mass of TA-like expertise, under the TA banner. In that regard, it can be understood as a TA advocacy structure in Portugal. An attempt at coordinating the distributed activities is the structuration of the network into thematic working groups (health, innovation indicators, transport and mobility, foresight). These groups provide the opportunity to move beyond the individual PhD research project to synergize with other people in similar areas. There are also journals that published TA-related research: Enterprise and Work Innovation Studies and IET Working papers series.

The organizational structure of GrEAT is deliberately loose with as little administrative burden as possible in order to be as open to participation and membership as possible. While some members of GrEAT see the network mainly as a rather informal academic exchange platform, the more active members of the group soon began to engage in political advocacy regarding TA. Those approximation efforts towards policy-making include: inviting individual MPs to the GrEAT conferences, and engaging in personal contact with some of them; being invited to a parliamentary hearing within the Commission for Education, Science and Culture and proactively proposing guidance, offering their services and suggesting organizational arrangement to carry out TA in Portugal by the means of a memorandum. The group's participants also intend to approach Parliament with their research results, for which they have started to write research briefs (tópicos) inspired by the practices of POST (see POST-notes⁹⁰), the Rathenau Institute or other PTA institutes in Europe. These briefs, mainly based on the different individual PhD projects, feature state of the art representation of the studied issue, first research results and even recommendations for decision-making. On top of that, the group has also put efforts into listing and (partially) translating a very exhaustive database of TA projects that have been carried out in the past by TA institutions in the EU & US (see Boavida 2012a&b).

⁹⁰ POST notes are TA briefs around 5 pages, issued by the Parliamentary Office of Science and Technology in the UK Parliament. For an overview visit <http://www.parliament.uk/mps-lords-and-offices/offices/bicameral/post/publications/postnotes/> (accessed 8th of January 2015)

On the international level, GrEAT has also engaged in talks with the directors and leading personalities of existing European TA organizations. The group subsequently applied to join the EPTA network and gained observer status following the 2013 council meeting in Finland. Later, it also applied to become part of the Technology Assessment Portal⁹¹ - an online repository of experts, projects and publications of TA initiated by the PACITA project. Doing so it gives additional (international) visibility to the GrEAT members and their research.

More recently in 2015, after a restructuration of different FCT and social science research units at UNL (among which CES.NOVA), the Observatory of Technology Assessment (OAT) was created. It conducts research at the intersection of sociology, engineering, management and STS. This research group also originated around the PDAT and gathers a series of PhD students and well as more senior researchers from across the country. Furthermore, it also understands itself as an interlocutor for national TA actors and engages in national and international collaborations⁹². The observatory is integrated in the interdisciplinary Centre in Social Sciences (CICS.NOVA) in the Faculty of Social and Human Science at UNL, which is the result of the merging of several applied and fundamental research centers in social sciences. One of the projects comprises the creating and management of a knowledge repository of TA relevant projects and publications for the Portuguese Parliament (in negotiation, see below).

4.3. The PACITA Project and the Portuguese coordination

In 2011 the PACITA project started (see chapter 2). Previously to the launch of the project, Dr. M. Almeida received a post-doctoral fellowship enabling her to begin a research project with two objectives: firstly, to study TA practices within Parliamentary Office of Science and Technology in the UK Parliament and secondly, to explore the practices and possibilities for developing such TA approach in Portugal. During this time, she received support from D. Cope, the former Director of POST and was introduced to L. Klüver, Director of the Danish Board of Technology (and then future) coordinator of this project. Joining the project represented a major opportunity to support her initial research as well as additional support and resources. In order to be able to join the project, Almeida affiliated with the ITQB (Biological and Chemical Technology Institute) at UNL. Starting the project on her own, she received additional personal support with a second researcher towards the second half of the project to carry out some of the national activities. In the meantime, besides the continued support of Cope and the staff from POST, the PACITA team at ITQB was also aided by Dr. T.

⁹¹ <http://technology-assessment.info> (last accessed 25th of April 2017).

⁹² For a list or research projects : <http://sites.fct.unl.pt/observatorio-avaliacao-tecnologia/pages/projectos-de-investigacao> (accessed 19th of June 2016).

Santos Pereira Research Fellow at CES (Centre for Social Studies) at the University of Coimbra for some tasks.

Organization wise, ITQB also created a “Science and Society” division towards the second half of the PACITA project. It comprised of a subdivision called “Science and Policy” featuring the particular PACITA activities. More recently it collaborated with ICS-ULisboa in another worldwide citizen consultation on climate and energy coordinated by the Danish Board of Technology Foundation⁹³. The Science and Policy⁹⁴ division at ITQB continues its work with the current H2020 project “Genetics Clinic of the Future”, which aims at mapping the challenges and opportunities raised by clinical next-generation sequencing of DNA by engaging with a wide range of stakeholders.

Let’s consider the main PACITA activities, which took place in Portugal. ITQB typically participated in a range of work packages, common to all (non-PTA) countries such as the exploratory country-wide study investigating the opportunities and challenges for the development of a national TA infrastructure (Hennen & Nierling 2013). The tasks included interviews and the organization of two national workshops with STI stakeholders from different public administrations, academia and civil society organizations (Almeida 2012). The first workshops reviewed different organizational forms and how to organize the expertise to serve Parliament and identified “*a unit inside parliament*” as a preferable option. The Portuguese PACITA Partner also hosted a three-day training program for young European TA practitioners⁹⁵ in September 2012 (Bütschi et al. 2016). More particularly, two other important PACITA activities engaged more directly with the Portuguese Parliament (Krom et al. 2016). Firstly, ITQB participated in a Future Panel on the issue of Public Health Genomics⁹⁶. This involved the organization of a policy hearing⁹⁷ at the Portuguese Parliament in January 2014. The chosen method is often described as expert-based and additionally involves mainly parliamentarians in the process. Secondly, ITQB organized of a parliamentary debate within the Assembleia da República⁹⁸, which brought together key policy-makers and

⁹³ <http://climateandenergy.wviews.org/> (accessed 19th of June 2016).

⁹⁴ http://www.itqb.unl.pt/science-and-society/ciencia_e_politica (accessed 16th of July 2016)

⁹⁵ For more information: http://www.pacitaproject.eu/?page_id=1268 (consulted on the 4th of January 2015)

⁹⁶ ITQB also participated in another PACITA pilot project, i.e. the work package carrying out a European-wide citizen consultation on the topic of sustainable consumption. A meeting regarding this consultation project was held in October 2014. However, at this stage, there is no evidence of an impact whatsoever on the above described institutionalization process of TA. Except that Portugal participated in another World Wide Views Global Consultation on Climate and Energy in 2015 (<http://climateandenergy.wviews.org>).

⁹⁷¹⁰ For more information: http://www.pacitaproject.eu/?page_id=2624 (accessed 17th of July 2016)

⁹⁸ Among the Portuguese participants were three national MPs (M. de Belém, O. João, and R.P. Duarte), as well as the president of FCT (M. Seabra), several Academics: Dean of Catholic Lisbon School of Business & Economics (F. Velhoso), J. Caraça (Goulbenkian Foundation) M.E. Gonçalves (ISCTE-IUL), M. Ligia (ITQB) and T.

senior TA staff to discuss the issue of “Strengthening Technology Assessment for Policy-Making” in April 2014.

As mentioned in the PACITA chapter, towards the end of the project, the “expanding the TA landscape” task had increasingly become open ended and strategic choices of additional activities were left open to the appreciation of local partners. While some have invested additional efforts in dissemination activities of project results (the Czech partner for instance) or invested particular (additional) topics (the Walloon Partner with the TA working lunches) or a combination of both (KEF in Lithuania translated research and project briefs from other European TA institutes), other partners like Portugal have chosen to deepen the debates about the best organizational forms of TA and how to institutionalize the practice in their respective national environments. On the 15th of March 2015, ITQB organized a conference entitled “Opportunities and challenges of Technology Assessment in Portugal”. The format was pretty much inspired by the previous “national workshop”, consisting of invited international guests from European TA institutes⁹⁹.

The diversity of PACITA activities was also the occasion to jointly mobilize several Portuguese actors in addition to the national partner. During the 2014 second PACITA European TA conference, held in Berlin on 25th -27th of February 2015 for example, Almeida invited two Portuguese MPs (R.P. Duarte & M.I. Aguincha, see below) to attend some presentations and network with policy-makers and senior TA experts from other countries.

Although not being appointed as the official national PACITA partner for Portugal, some GrEAT members participated in several PACITA activities. Indeed, some training (summer schools, practitioners trainings or the two European Conference) or debating activities (national “expanding the TA landscape” workshops and parliamentary conferences) were open to all interested actors. In addition, the position of A.B. Moniz at ITAS (KIT, the German partner organization in the consortium) also allowed him to take part (under the banner of KIT, but often reacting to PACITA activities related to Portugal) in many more activities of this FP7 Project - including consortium meetings.

Santos Pereira (CES). For more information: http://www.pacitaproject.eu/?page_id=2720 (accessed 17th of July 2016)

⁹⁹ (S. Belluci (TA-Swiss), G. Munnichs (Rathenau), A. Goater (POST)) or experts in the area (W. Bijker (U. Maastricht) to share their experiences and exchange with Portuguese actors (such as GrEAT Member and PDAT lecturer L. Vasconcelos FCT-UNL), Members of Parliament (M. de Belem Roseira; R. P. Duarte) and other actors of STI governance (representatives of the Portuguese Environmental Agency, National Council of Science and Technology, Health Cluster, etc.).

The relationship between the GrEAT network and the national PACITA partner ITQB are slightly complicated. For a long time, there has not been much coordination and acknowledgement of each other's efforts. Both pursue the same goal to develop TA in Portugal, notably through engaging with the national parliament and by participating in different European exchanges. However, their strategies and more concrete vision slightly differ, notably with regard to the role those two groups could play in a later stage of more formalized parliamentary TA activities. This conflictual co-presence and cooperation will structure and influence the dynamics of the TA-related activities in Portugal during the PACITA project. Often not explicitly outspoken, the different views held by both collectives have recently become more public with an exchange under the form of an article co-authored by Moniz (Böhle & Moniz 2015) and a response by Almeida (2015) in the ITAS-run TA journal TATuP.

4.4. S&T activities in Parliament

Before going into the details and whereabouts of the process of installing a TA capacity in the Assembly of the Republic of Portugal, it is useful to consider how S&T issues have been dealt with up until today, in the absence of a formal structure of PTA. For this purpose, we will draw on previous case studies about socio-technical debates in Parliament, a survey about scientific literacy and engagement of Parliamentarians and Public Understanding of Science activities in its premises. The findings of these studies shed a particular light on a number of expectations and discourses that are also relevant to understand the particular development of TA in Portugal.

On the informal level, a meaningful way to analyze parliamentary activities or public debates on science and technology is to look into so-called "socio-technical controversies". Rip (1986) has shown that controversies can be considered as a means of "informal technology assessment" that notably foster social learning processes. In Portugal, Pereira et al. (2010) have studied two particular socio-technical controversies and how they played out in Parliament: the nuclear energy debate and medically assisted procreation. A mentioned tradition of parliamentary *ad-hoc* committees (Pereira et al 2010) in dealing with socio-technical controversies was also confirmed in our interviews, with often-cited examples of a co-incineration plant and the siting of Lisbon Airport. The co-incineration issue actually gave rise to a quite unique "*mixed Commission at parliament involving experts and representatives of the public who debated the co-incineration technology issues [...] 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 in Böhle & Moniz 2015: 37). The picture of an

uninvolved Parliament in Science and Technology issues thus needs to be slightly relativized. The nature of Parliamentary action may also vary from one issue to another. In the case of nuclear power, Pereira et al. (2010) found that due to the nature of the interventions that occurred, the role of Parliament had been as a place of reoccurring general debate and deliberation as well as governmental accountability and control without necessarily producing concrete legislative proposal. On the other hand, their study of parliamentary debates on medically assisted procreation reported a number of different and timely legislative proposals. In our interviews, we found that Parliament as an institution is indeed often put forward as a warrant of legitimacy and authority, notably through its representation mechanisms. MPs are, however, rather modest regarding their own scientific knowledge. Pereira et al. (2010) identified an approach of “external delegation” to describe a tendency to relegate/assign to public administration, scientific institutions and specialized committees the legitimacy to produce politically relevant knowledge. The authors also observed that the reference to foreign experience was often used to create consensus and closure of controversies whereas national references were rather used to support political dissent.

On a more formal level, the *Ciência Viva* agency (see above) has run (bi)annual Science Cafés in Parliament since 2005. This initiative, initiated by Minister Gago invites experts from a great variety of disciplines to discuss particular S&T topics¹⁰⁰ with societal and political implications relating to an audience of parliamentarians, journalists and members of the general public. The initiative however remains predominantly a “Public Understanding of Science” activity (see Educational STI Governance style sketched above) that is out of sync with everyday work of Portuguese Science Policy and legislative activities. Relying on a survey about Science in the Portuguese Parliament from 1995 carried out by the center for research and studies in sociology (CIES) and the Portuguese federation of Scientific associations and societies (FEPASC) (CIES & FEPASC 1995 quoted in Pereira et al. 2010) MPs considered that the creation of a facility in Parliament to provide services for interpreting scientific and technical information would be one of the principal ways to improve the scientific information available to members. An initial response to the need of provision and interpretation of scientific information for parliamentarians was the creation within the Parliament in 2006 of the (UTAO) “*Technical Unit of Budgetary Support*”¹⁰¹, which Pereira et al. (2010) considered

¹⁰⁰ 2014: Tinkering with the Brain, Science, Ethics and Society; 2013: The Future of Water, sustainability challenges; 2013: Space Science, opportunities on Earth; 2012: Fundamental and Applied Research: the Higgs boson; 2012: Geology - The past present in the future; 2011: Chemistry for a Sustainable Future; 2010: Science for Biodiversity; 2009 Marine Science, new technologies and the exploration of marine resources; 2008: High-voltage grids, antennas and risk awareness; 2007: Energy and Climate Change; 2005 Scientific Culture and Political Decision-Making.

¹⁰¹http://www.parlamento.pt/OrcamentoEstado/Paginas/UTAO_UnidadeTecnicaApoioOrcamental.aspx (consulted 13th August 2014.)

as a boundary-organization¹⁰². However, the highly technical character and specificity of budgetary issues compared to other policy-making areas resulted in a quasi-exclusive focus from this Unit on these topics. From 2009 on the issue of a TA in Parliament will become more prominent and widely discussed.

5. Chronology of TA uptake at Parliament

In 2009, the Standing Committee for Education, Science and Culture (CECC) issued a “Report about Science” (Rapporteur MP Bravo Nico – Socialist Party - PS) looking into the role of national R&D structures for economic and social growth. In the same year, this report led to Parliamentary Resolution (n°60/2009) entitled “*deepening the activities of the Assembly of the Republic in the areas of Science and Technology*”. It suggested setting up an institutional platform promoting meetings between politicians and scientists to provide Members of the National Assembly with anticipatory, qualified, usable and punctual information on scientific, human, social, economic and environmental consequences and controversies in relation to public policies. It further called for the feasibility study of installing a Parliamentary Office of Science and Technology and suggested exploring the membership possibility of the Portuguese Parliament in the European Parliamentary Technology Assessment (EPTA) network¹⁰³.

This resolution was adopted unanimously. Only in October 2011 MP R. Santos (PS) was appointed rapporteur to further investigate operationalization of those objectives. In September of the same year, the Chairman J. Ribeiro e Castro (Christian Democratic Center, People’s Party - CDS-PP) of the CECC had publicly committed to make efforts to develop TA in Portugal during a cross-European Conference on TA organized by STOA in the European Parliament (Almeida 2015b). For such a task, the rapporteur was asked to gather information about the EPTA network and the different organizational models of its members before presenting a proposal for deliberation in the Commission for Education, Science and Culture (CECC). Santos’ report was finally delivered in February 2013 and comprised two parts.

The first chapter, with the help of the Legislative Information Service of the Assembly, addresses elements of comparative law regarding the different institutional models

¹⁰² Boundary Organizations are mediating bodies between scientific and political institutions which often result in a productive tension for both science and policy (cf. Guston 2001, Miller 2001)

¹⁰³ Strangely, it also mentioned, “*to promote efforts that will allow for the Portuguese Parliament to become a member of the Interparliamentary Space Conference.*” From a “purely” TA perspective, this seems odd, but one has to replace it in the broader rationale of the resolution aiming at generally strengthening S&T activities of the Assembly of the Republic. As we will see later, network membership and participation is perceived as an important (catching up or keeping up) strategy in countries of (semi-)peripheral condition.

present within the EPTA network. Supported by the European Centre for Parliamentary Research & Documentation it surveyed 30 out of 62 countries. On top of those researches, the report also accounts for a series of events and exchanges of views (hearing of M. Almeida on 19th April 2012 by the CECC regarding the PACITA project and the rapporteur's participation in the EPTA directors' meeting in Barcelona on 14th-16th May 2012 where he requested for Portugal to become an observer member). During Almeida's hearing, the discussions centered on the taxonomy inspired by Enzing et al. (2012): a minimal "unit" within a commission, an autonomous "office" within parliament and an independent organization. To illustrate more concretely the Office model and answer MPs questions' relating to deliverables, staff and budget issues, Almeida referred to the Parliamentary Office of Science and Technology (POST) in the U.K.

The second chapter deals with the operationalization option for TA at the Republic's Assembly of Portugal. R. Santos' interpretation of the 2009 resolution and translates into a preference for the so-called "Parliamentary Office" model: an interface structure between the Parliament and the scientific community, which should provide a service of scientific and technological analyses to MPs. The office would then be organized by a board and a working group, which would develop the necessary mechanisms for information gathering, analysis and the production of reports and notes (Santos 2013: 19). Retrospectively, Almeida relates that the Office would start with a project phase and be integrated into the Parliament with a staff of 4 and a yearly budget of 200.000€, including "*salaries, costs of external experts, as well the organization of events for debate and dissemination*" (Almeida 2015b: 104).

The Santos Report was followed by a document identifying the next step to be taken and entitled "*reorientation of the mode of organization of the Republic's Assembly with regard to TA*" (2013: 22). The report was assessed by the Commission for Education, Science and Culture and submitted the question of the mode of organization of PTA to the President of the Assembly. Simultaneously, the opinion of the Board of Administration of the Parliament was also requested for its administrative and financial impacts. Finally, it was concluded that there was a "*total absence of a budgetary framework for the initiative*" (2013: 23) and recommended to opt for a different model of organization. In order to reflect this new (budgetary) reality, the report recommended to revise certain provisions of the resolution and instead to continue the process with one of the two other types of organization (cf. Enzing et al. 2012) taking into account existing means and resources and either placing TA under the jurisdiction of the Assembly, or of other external state entities. As a way forward, the "*Parliamentary Commission*" model (also Parliamentary Committee/Commission model in Enzing et al. 2012) run by the CECC was immediately put in place. A rapporteur (R. P. Duarte - PS) was assigned¹⁰⁴ with

¹⁰⁴ The document ends with the recommendation to nominate immediately a permanent rapporteur for the

contacting international networks of technology assessment and initiating a consultation process with external national entities. In upcoming hearings and dialogues the CECC would evaluate if and how the 2009 resolution should be revised – either by permanently adopting the “commission model” or alternatively choosing the “*independent and exterior to the Parliament model*”.

Almost a year later, in January 2014 a series of formal hearings were re-initiated within the Commission (see list of auditioned experts below). The experts invited to participate were proposed and chosen by the various political groups and were assumed to represent the landscape of TA-knowledgeable people in Portugal¹⁰⁵. The following paragraphs shortly present the main content discussed during the different meetings in chronological order¹⁰⁶. We will focus on the organizational argument (the preferred alternatives to the Office model) here and more particularly on the injunction to focus on existing resources and working with external entities. More particular discourses about the role, need and rationale for TA in Portugal will be developed in later sections.

Auditions about Technology Assessment in the Parliamentary Commission of Education, Science and Culture:

15th January 2014: M. Almeida (ITQB): Information about PACITA activities and demand for MPs’ participation

19th February 2014: A. Moniz and colleagues (GrEAT, PDAT): Description of GrEAT, PDAT and presentation of Memorandum for a Parliamentary Technology Assessment Unit associated with a digital library.

26th February 2014: J. Caraça (Goulbenkian Foundation): review and personal preferences regarding organizational models

11th March 2014: M. Heitor (IN+, IST¹⁰⁷ and former secretary of state for Science, Technology and Higher Education): specificities of Parliamentary Technology Assessment (highlighted with examples from POST) and existing analytical capacities

1st April 2014, V. Simões (Lisbon School of Economics and Management): rationale of TA and concrete topical examples

whole legislature. This rapporteur would have the same status as other rapporteurs or working group coordinators within the Commission for Education, Science and Culture.

¹⁰⁵ Surprisingly, in our study, we did not find evidence of formal meetings with representatives of the state laboratories, as had been suggested in the report.

¹⁰⁶ The following presentation is a selection of the content of the respective hearings and presents the most crucial elements to understand the continuation of the process and content of debates. The entire exchanges can be found on the website of the Assembly of the Republic <http://www.parlamento.pt/sites/com/xiileg/8cecc/rtatp/paginas/audicoes.aspx> (accessed 8th of January 2016)

¹⁰⁷ Center for innovation, Technology and Policy Research (IN+), Instituto Superior Técnico (IST)

To sum up the discussion, there seemed to be a broad consensus regarding the rationale of equipping Parliament with a TA capacity. Further, the introduction of a parliamentary TA unit or office is the model most commonly presented as being desirable for Portugal (Caraça) and exemplified by the experts with the British (Almedia, Heitor, Moniz) and German TA offices (Moniz) — the models Almeida and Moniz were respectively most familiar with. Due to budgetary constraints, this has been declared as currently not implementable and the different MPs repeatedly mention it, with very little contention in contrast to interviews. The so-called parliamentary “committee model” has therefore been chosen as an alternative option and declared *de facto* operational with the appointment of a rapporteur. In the meantime, the CECC continued to listen to the opinions of experts and to reflect on possible further steps or alternative models. Future options include either a consolidation of the chosen committee model or a shift towards an “independent model”. The main discussion points regarding an independent model are its independence, the parliamentary control, the legitimacy, funding and competence of such an organization as well as the nature of communication between MPs and experts. The independent model got under critique for its missing formal relationship to Parliament, the particular work and authoritative institution it represents. Public Participation is marginally mentioned by Almeida, Moniz and Heitor, especially in the context of reconnecting politics and citizens and establishing a scientific citizenship. Alternative models have also been proposed in rough outline. These include loose notions regarding the development of an (exchange) platform or network (Simões, Heitor) as well as what could be considered as TA 2.0 models – a virtual, online repository and exchange infrastructure (Moniz). They are either proposed as declinations of a rather loose understanding of the “independent model” or as an additional separate alternative.

Let’s consider more in detail the audition of GrEAT and the content of the memorandum that was submitted to the CECC at this occasion. It was indeed the furthest developed alternative proposition. As we will see, it will have significant influence on the subsequent process. We will come back to some elements of the other auditions in later sections, notably regard discourses about TA.

During his audition Moniz introduced the GrEAT network as well as the PhD program. He highlighted previous contacts with MPs from various political groups (at conferences or via personal contacts) and offered acting as an intermediary with international experts and the basis of GrEAT’s EPTA observer status and several collaborations throughout Europe. Moreover, he offered Parliament the support of the GrEAT network, in the form of the dissemination of research results from current projects or the organization of activities such as workshops open to both policy-makers and the general public. At the same time, GrEAT also submitted a concrete memorandum for a

Parliamentary Technology Assessment Unit and a digital Library. It foresees the provision of scientific knowledge based on existing resources and possible external funding, hypothetically via an especially dedicated funding line for TA from the FCT. The proposal suggests a mixed unit made up of representatives from the Parliament, scientific representatives and representatives of the financing entities. In a first (pilot) phase it may only concern the CECC, GrEAT and the FCT and later accommodate additional representatives of other Parliamentary commissions such as economy, health, the environment and ethics as well as extra-parliamentary or “scientific” representatives from the PDAT and PDEPP (PhD Program on Engineering and Public Policy) as well as other financing organisms¹⁰⁸ such as the Gulbenkian Foundation, the Champalimaud Foundation¹⁰⁹, INFARMED¹¹⁰ and possibly others up to a total around 15 or 17 members. Claiming to have a working procedure inspired by the German TAB, the British POST and the French OPECST, a Unit would propose topics, prioritize them, prepare the tender for contracting studies out and evaluate the first report versions.

Additionally, a library would provide rapid access to a vast repository of studies and publication about controversies, social implication and other problems associated with technology development, transfer and introduction, referencing past (foreign) TA experiences, electronic versions of articles and publication, academic theses, books or chapters and most recent work on tendencies, forecasts and more generally foresight studies. The library would facilitate the Units process of giving input and progressively compile all its reports. Furthermore, GrEAT offers to run and organize this digital library and suggests resorting to foreign experiences having started similar tasks such as the German-speaking OpenTA¹¹¹ initiative and the PACITA initiated TA Portal¹¹². Anticipating little costs in that regard, Moniz suggested submitting a little project request for funding to the FCT with the implication of the GrEAT network and the Assembly of the Republic.

¹⁰⁸ He insists on the fact that those financing entities should be relevant in the field of TA (interested in the development of S&T and their social, economic, cultural impacts as well as health Technology Assessment, which he finds gains in importance. The mentioned examples of Gulbenkian and Champalimaud foundations are private non-profit. FCT and INFARMED are Agencies under the respective authority of the Ministry of Science and the Ministry of Health. There is no specification regarding possible other private (possibly for profit) income sources.

¹⁰⁹ The Champalimaud Foundation is a private institution regulated under Portuguese law and recognised as public utility entity. It undertakes research in biomedical science.

¹¹⁰ INFARMED (National Authority of Medicines and Health Products) is a Government agency that monitors, assesses and regulates all activities relating to human medicines and health products for the protection of Public Health. It is accountable to the Health Ministry. See: <http://www.infarmed.pt/portal/page/portal/INFARMED/ENGLISH> (last accessed 25th of April 2017)

¹¹¹ <http://www.openta.net> (last accessed 25th of April 2017)

¹¹² <http://www.technology-assessment.info> (accessed 19th of April 2017). The GrEAT network has in the meantime become an institutional member of this portal.

Depending on the amount of annual studies, the anticipated costs approximate around 55.000 € to 130.000€. Some arrangement may even be made directly between external financing organisms and the applicant's research center or consortium without engaging the Parliament's budget. No indication however is given regarding possible topics for the experimental pilot project (of an estimated period of 2-3 years), which would need to be evaluated by the Parliament.

As mandated, rapporteur Duarte delivered its final report on the 21st of June 2015. Summing up the process undergone so far, he also accounted for the participation of different Portuguese MPs in the different auditions, exchanges and conference visits such as the EPTA directors Meeting in Oslo 2014 and the PACITA conference in Berlin. Given the unchanged budgetary situation and after having evaluated the different propositions (he only explicitly mentions PACITA¹¹³ and GrEAT), his report proposes to advance on several grounds simultaneously and relatively independently from one another.

At first, the concrete solution foresees as so-called "independent" model but nonetheless situated within the Parliament and MPs exerting a tight control over the whole process. This option still needs to be explored via a pilot-project and the conditions and possibilities of financing such an arrangement (without engaging the Parliament's own budget) would need to be re-assessed by the Parliament's Board of Administration. The working method¹¹⁴ of the proposed model would be based on two organs: Firstly, a coordination board made up exclusively of MPs, with a representative of each commission in Parliament and a chairman. Secondly, a consultation board would be composed by a representative of PACITA¹¹⁵, one from the State Laboratories, one from the associate Laboratories¹¹⁶, one from the Science and Technology Foundation (FCT), one from GrEAT, one from (undefined) associate scientific programs in TA¹¹⁷ and (future) representatives (plural) of funding entities¹¹⁸. The coordination board would propose a set of topics to TA scrutiny. Duarte mentions that this process could

¹¹³ In this particular context PACITA is reduced to the Portuguese partner ITQB and the national project manager of the project Mara Almeida.

¹¹⁴ The report says it is inspired by the German, British and French and European Parliaments' examples.

¹¹⁵ Here again, reference is made to the national coordinator, not the whole European project.

¹¹⁶ Associate Laboratories in Portugal is a title delivered for the period of 10 years to selected scientific research unit (public or private not for profit organisations) that contribute to specific objectives of the Government's STI policy. More information consult:

<https://www.fct.pt/apoios/unidades/laboratoriosassociados> (accessed 8th of January 2016)

¹¹⁷ Almeida (2015) mentions the PDAT and the PhD program on Engineering and Public Policies at IST-UL coordinated by Prof Manuel Heitor.

¹¹⁸ This composition however, is not definitive and subject to a re-evaluation after the pilot-project.

potentially be fueled by parliamentary hearings or public consultation processes. Those proposals are then examined by consultation board, which issues a (non-binding) opinion. Subsequently, the coordination board elaborates a research agenda for TA as well as details for the tender and financing. Work would be outsourced (this is the actual “independent” element), thus requiring no in-house capacities and additionally profiting from (synergies with) third-party expertise and funding.

Secondly, Duarte proposes the parallel creation of a digital library. According to the rapporteur, such instrument would only require minimum funding and could build on partnerships and synergies. Content-wise, it should constitute a historic repository of pertinent experiences and policy-oriented work carried out in other countries as well as academic publications relevant for Technology Assessment, recent foresight studies and documents about the consequences of technology transfers. Hence it would provide a source of inspiration and guidance for MPs and the coordination board. Finalized reports would automatically be fed into this repertoire and made more widely available. Besides conditions of easy and straightforward access and utilization for MPs, some questions remain regarding the possibility of the general public to access such a repository, the structure and responsibility for daily-operation and management of such a documentation system.

As one can see at this stage, several issues remain uncertain, sometimes pushing the project of TA in parliament back several years in the past, with a different starting situation. Instead of a “Parliamentary Unit” and the transitory “Committee model” the report now advocates an “Independent model”. Important constitutional and budgetary questions are again delegated to the Parliament’s Board of Administration and a new transitory phase is proclaimed: the phase of information gathering, consultation processes and international networking gives way to a loosely defined pilot project. This potentially leaves the doors wide open for further reorientations of the project in the future.

While mixing the terms Parliamentary Unit and Independent model, Duarte’s report borrows considerably from GrEAT’s memorandum. Indeed, the external or independent model is pretty much inspired by the proposition of Moniz’s team. The latter did not use the term independent model and rather referred to so-called Units but his emphasis was especially on the subcontracting character and funding external to Parliament. The idea of the digital library gets almost copy-pasted in the report. Nonetheless, Duarte slightly modifies the proposal in some regards. He cautiously integrates the PACITA partners (ITQB) in the consultation board for a better balance and representation of the different actors at play. Also regarding the governance structure, he proposes a system of two boards where MPs have a stronger position than the experts in the consultation board.

The process of installing TA in the Parliament has currently lost much of its political momentum. MP R.P. Duarte's report was delivered at the very end of the 2011-2015 XIIth legislative term. After the elections, many of the MPs of the CECC and involved in the hearings are not in office anymore. The 2015 election resulted in very tight results between the different parties from the political right and left. A first attempt at setting up a right-wing government under Prime-Minister Pedro Passos Coelho was aborted by the left-wing opposition. Antonio Costa became the new prime minister in a minority government made up of Socialists and independent candidates¹¹⁹ and externally backed up by the radical left. This turmoil has largely monopolized the political debate for some time. How the situation will evolve regarding TA is unclear.

6. Characterization of the institutionalization of TA in Portugal

Against a binary and deficit approach (i.e. TA is considered as formally institutionalized or not), the present section aims at characterizing the form of institutionalization of TA in Portugal. This signifies to look at both the present situation as well as the efforts undertaken to change this situation, gauging tendencies of possible future characteristics of TA in the country. Consistent with the other case studies, this process will be examined by attention to both organizational and cognitive dimensions. Firstly, the organizational aspects consist of an inventory of the plural actors and organizations engaged in the practice, their relationships and the different spheres of activity (government, parliament, science and technology, society) and their development strategies. Those relationships are then synthesized according to the inclusive modeling approach proposed by Ganzevles et al. (2014). Contrarily to the Walloon case study, such relationships are not succeeding one after the other; rather, attempts at institutionalization and organizational model compete with each other and pertain to relatively different rationales and sources of inspiration. The process of building up TA and TA-like activities and relations with the 4 spheres of activity is much more gradual. This allows going into more detail into the activities taking place in relation to Government, Parliament, Science, and Society. Secondly, the cognitive aspects refer to the rationale on which the practice builds and how it develops. This includes the discourses and expectations of promoters, sponsors and potential addressees as well as the context in which the practice is invoked. Such claims and expectations simultaneously construct a diagnosis of the present situation with particular problem identification. Furthermore, it matters to see how the practice makes up a community among advocates and practitioners and how to characterize the latter.

¹¹⁹ It may be worthwhile to note that M. Heitor, one of the auditioned experts and proponent of a Parliamentary Unit of Technology Assessment was appointed Minister for Science, Technology and Higher Education as independent candidate.

6.1. Organizational aspects

Consistent with the inclusive modeling approach developed by Ganzevles et al. (2014) distinguishes between the involvement of the four spheres of Society, Government, Parliament, and Science and Technology on three different levels: The macro level comprising the mission, the client, the funding source and evaluation or the organization.). The meso level consists of the board composition, the allocation of financial and human resources and qualifications as well as the concrete working procedures. The micro level is concerned with the affected project staff as well as review procedures for the concrete work. Throughout the process of installing TA in Portugal and its different revised version, the involvement of the different actors-spheres may considerably vary. Hence, we will draw additional attention to the variations in the involvement of these four spheres throughout the last years.

6.1.1. Government

At the level of Government, as we have seen, some planning, evaluation or assessment activities are considered TA-like by a series of interviewees and authors. Relationally speaking however, they only minimally involve stakeholders (Godinho & Simões 2014, Almeida 2012). This reflects the general tendency to see Science Policy as an exclusive prerogative of the government and is described as the dominant discretionary style of STI governance (Hagendijk et al. 2005). The existing activities the government holds towards the Parliament and the general society (see *Ciência Viva* and *Science Café* initiatives for instance) are characterized by the “deficit model” of “Public Understanding of Science”, meaning that resistance or bad scientific and technological decisions are supposedly based on ignorance which can be tackled by information provision (see for instance Wynne 2006). This is also reflected in the Educational governance style portrayed by Hagendijk et al. (2005). Additionally, as Moniz stressed in his audition, TA-like activities in Government lack certain independence, since they are very close to the administration of the STI system. Hence, TA at the governmental side is relatively isolated from other initiatives, notably at the Parliamentary level. Although the Government was largely absent from the debates on the institutionalization of Parliamentary TA, it indirectly enters the scene when it comes to possible funding options. In the reformulation of the resolution and the consultation mission of MP Duarte, the Santos report emphasized the role the state laboratories could play in the consultation process but also in the Duarte’s recommendations of the opting for the independent model¹²⁰. Indeed, the latest proposal by MP Duarte notably foresees, in line

¹²⁰ State Laboratories are public research institutions working towards science and technology objectives defined by the Government. Besides Scientific research and technological development, they are also active in the provision of services, industry support, expertise missions, standardization, certification and regulation. For more information visit: <http://www.fct.pt/laboratoriosestado/index.phtml.en> (accessed 8th of January 2016)

with Moniz's proposal FCT funding for TA activities. In addition, FCT and the State Laboratories are foreseen in the consultation board. However, there are no signs that those entities have been involved in the processes at the Parliament.

6.1.2. Science

We have seen that the TA label is not particularly widespread in Portuguese academic circles. However, what can be considered as TA-like activities is much broader, diverse and distributed. Based on this observation, some auditioned experts (Moniz, Heitor) highlight that TA expertise is sufficiently present in Portugal. Nonetheless, there are also high expectations and dependencies towards European and international collaborations as well. European standards also gave significant impulse into risk research and practices of impact assessment. The different Framework programs financed several important projects with Portuguese participation concerned with the interplay of Science, Society and Policy. For collaborations with European TA organizations, one can for instance mention projects like "Assessing Debate and Participatory Technology Assessment" (ADAPTA: 1998-2000, ISCTE as Portuguese partner); "European Debates on Biotechnology" (EUDEB: 1999-2000, CES as Portuguese partner); Science, Technology and Governance in Europe (STAGE: 2001-2005, CES as Portuguese partner) or "Deepening Ethical Engagement and Participation in Emerging Nanotechnologies (DEEPEN 2006-2009, CES as Portuguese partner)¹²¹. Thus, it is not surprising that EU funds are mentioned on frequent occasions relating to the funding option of TA (cf. audition of M. Heitor in the CECC or the intervention of F. Veloso during the PACITA second Parliamentary Debate in Lisbon see Bütschi 2014). The European influence in the field of TA was recently reinforced from 2011 on via the PACITA project, which again associated a scientific institute as Portuguese Partner.

After initially focusing efforts on the best organizational model for TA, the Portuguese PACITA partner soon turned to an *"analysis of how the policy-making processes are supported with relevant and independent information"* and to *"create the strongest lines of communication with the Parliament and be the most effective in breaking the isolation of decision-makers from potential suppliers of information and knowledge"* (Almeida 2012: 266). In this case, the PACITA partner offered several facilitation and networking opportunities between distributed knowledge providers, Parliamentarians and other actors of STI governance. One could say it contributes to create "relational expertise", i.e. the social construction of policy-relevant knowledge and its communication channels (Ganzevles et al. 2013/4).

¹²¹ See Delicado 2013 for more examples.

For the GrEAT network and associated groups (PDAT, OAT) international contacts and networking are equally important Academic partnerships with TA units in Germany and The Netherlands are providing a crucial support for this endeavor. On the national level as well, they aim at building up critical mass in TA related competences. The PDAT aims at elevating Technology Assessment studies at a more professional and systemic level. The Observatory for Technology Assessment (OAT) in Portugal additionally aims at sustaining different TA activities (notably beyond the PhD research) within the Interdisciplinary Centre of Social Sciences (CICS.NOVA) at UNL. It also aggregates relevant TA knowledge by referencing different studies, reports, documents and events related to TA. From 2010 on, the GrEAT network was created as an exchange, networking and advocacy platform that aims at including a much wider range of people knowledgeable of TA than the sole juniors and seniors involved in the PDAT. Aiming to reach out beyond the circles of academia, the network started to contact Parliamentarians, inviting them to events and disseminating (preliminary) research results towards them. As one of the PhD students put it: *"We're doing research. It's already financed. It's for free. Use our expertise."* However, the research topics of the PDAT students are mostly self-defined and not explicitly aligned with Parliamentary priorities. Sometimes, they address issues that are of interest to their employers or organizations they are affiliated with. This echoes with the distributed governance understanding to which the PDAT graduates are supposed to integrate. As a matter of openness to society, some NGO representatives have also been invited to doctoral conferences and winter schools. In addition, Moniz insists that TA should not be restricted to the Parliament or Academia. As a scientific actor, he stresses the necessary implication of social partners in decision-making processes of S&T as well as other institutions active in technology policy (Moniz 2012a).

As we have seen above, ITQB and GrEAT both seek to influence the legislative process to further develop TA capacities. They hold different views on the organizational forms of PTA as well as the role they may themselves play within those constellations. On the one hand, the proposed model of M. Almeida was always influenced by the "Parliamentary Unit" or "Parliamentary Office" model (as defined by Enzing et al. 2012 or Hennen & Ladikas 2009). Besides having produced some issue-centered TA knowledge within the PACITA example projects (realistic expertise), much of the activities were rather of a dialogical nature (debates, workshops, meetings etc.). This objective to bring different actors together as to create the necessary expertise and communication channels (relational expertise) is to be put in relation to the limited capacities for TA at ITQB itself. On the other hand, the nebula of actors around GrEAT, the PDAT and the OTA have alternatively invested both the "Unit" or "Office" model as well as later on the so-called "independent" model. Both are actually compatible with the emphasized practice of outsourcing in which GrEAT means to play an active role as TA knowledge provider. The network indeed aims to provide itself the necessary "realistic expertise" as their

relations to the Parliament and its members were also more issue-centered and product oriented (providing research-briefs, translating foreign TA studies).

6.1.3. Society

As mentioned above in the dominant “discretionary” STI governance style (Hagendijk et al. 2005) Portugal has a rather weak civil society and not much experience with societal participation in S&T and TA-like activities. Furthermore, a study undertaken by CIES & FEPASC (1995 quoted in Pereira et al. 2010) showed that 54.2% of surveyed MPs considered that the influence of civil society on science policy was scant or non-existent. Furthermore, the same group was not willing to concede civil society an influence on science policy, nor acknowledging it as an adequate source of information in this field.

In the abstract conceptions of society, it may be useful to distinguish between organized civil society and so-called ordinary citizens, i.e. no collectives engaged in advocacy activities. Also in terms of public engagement, an analytical distinction needs to be drawn between invited and uninvited participation (Wehling 2012). Indeed, uninvited participation can often spark around so-called socio-technical controversies, which, following Rip (1986) can hold elements of “informal Technology Assessment”. There are records of local controversies that sparked public interest in S&T issues (such as the installation of co-incineration plant or the flooding of a paleolithic *Foz Côa* site for a dam construction (Mejlgaard et al. 2012)). A series of case studies on local social movement and issue-related, *ad-hoc* mobilization (Santos & Nunes 2006) somehow nuance the picture of a generalized weak civil society and nonetheless identify seeds for increased societal involvement in STI. *“Following the lethargy of grassroots extra-parliamentary activism that followed the normalization and consolidation of parliamentary democracy in Portugal, we are now witnessing a renaissance of societal activism, which draws on both local traditions of resistance and the opportunities offered by global processes such as European environmental directives”* (Karamichas 2007: 177). As we will see, the issue of public participation (invited or not) is differently perceived across the political spectrum.

Regarding invited participation, so far, country-wide NGOs or other organized civil society associations have not significantly engaged with the national TA scene, which remains mainly scientific. However, Delicado (2013) mentioned the Goulbenkian foundation as a major support of STS and TA-like activities. Also Moniz’s memorandum intends to include the foundation in the TA Board. Almeida organized the 2015 workshop in its premises. However, working for the Goulbenkian Foundation, Caraça did not comment on the proposal for his organization to finance possible project calls nor on the role it could potentially play in the TA knowledge production.

Some companies (SMEs) and local NGOs have sporadically participated in GrEAT activities or funded individual PhD research. Also the organizers of the TA conferences have tried to reach out to some companies and NGOs to attend their events, thus slightly opening the TA activities beyond the academic sphere. Boavida & Moniz (2016) also account for a series of graduated PhDs in Technology Assessment entering and playing a role in the labor market thus distributing TA capacities in the Portuguese society and different, multi-level, multi-actor processes where knowledge meets decision-making. More generally they claim that the PhD program was “*generated a significant social dynamic around the topic*” of Technology Assessment (Boavida & Moniz 2016: 81).

There have been embryonic experiences with direct (as opposed to organized advocacy groups) citizen engagement (European Wide Views, World Wide Views, courses on public participation in the PDAT and more recently the EU project CIMULACT with a private organization as Portuguese partner) but the impacts have not systematically been assessed yet and the activities are considered to be at an early stage (Mejlgaard et al. 2012).

Besides those first experiences, it is unclear what role society will play in the TA developments to come and how it will become involved. In GrEAT’s memorandum, the outsourced studies could possibly make use of public consultations, public participation or other “more elaborated methodologies”. Also Duarte’s proposal foresees possible public consultations before launching calls for tender. However, in GrEAT’s scenario, the studies should generally not last longer than 9 months, which is rather a short time to carry out fully-fledged public engagement exercises. In Duarte’s proposal, public consultations are possibly invoked at the topic proposition stage. Regarding public debate and societal involvement and in line with her efforts at creating relational expertise, Almeida (2015) mentions that the office model she proposed is “*also aimed at creating discussion platforms to involve different stakeholders, encouraging the development of a wider community able to influence the debate on S&T*” (2015: 106-107).

6.1.4. Parliament

For parliament as well, it may be of interest to distinguish between informal TA activities within Parliament and more formal and voluntary initiatives. On the informal side, the tradition of Parliament has been for a long time to deal with controversial S&T issues in an *ad-hoc* (i.e. sporadic, reactive and loosely structured) manner (e.g. the co-incineration issue or the sitting of Lisbon airport issues). The co-incineration mixed commission (involving experts and representatives of the public) at Parliament is said to have substantially raised the MPs interest for health and environmental issues and the need for independent advice (Matias 2008 in Böhle & Moniz 2015). We have also accounted for the punctual participation of individual MPs (especially the Commission

for Science, Education and Culture) in TA events and activities organized by ITQB and GrEAT. Those contributed to raise awareness and nurtured some of the more formal debates in the CECC. On the more formal side, The *Café de Ciência* no Parlamento (Science Café in the Parliament) within the *Ciência Viva* (Living Science) initiative regularly bring together scientists from various research institutions, state agencies, industry representatives and members of Parliament to discuss in particular the relationship between science and political decision-making.

Organizational wise, the Assembly of the Republic has reinforced its analytical capacity since the installation in 2006 of the Technical Unit of Budgetary Support (UTOP). Pereira et al. (2010) identified it as a potential “boundary organization” (cf. Guston 1999) potentially capable of providing technical support for legislative work in complex matters. Until now, its work remains exclusively concerned with budgetary matters in the present case. The process of organizational reinforcement was set to continue with the resolution of 2009, in which the Parliament expressed its will to be more involved in S&T activities, notably by investigating the possibilities of equipping itself with a TA capacity and joining the EPTA network. In the chronology of reports and hearings for the operationalization of this endeavor, the CECC soon ran into budgetary limitations expressed by the Presidency of the Parliament. Hence, the option of building up a capacity internal to Parliament (Parliamentary Office) was abandoned to work with existing resources. This is how an involvement of the governmental State Laboratories became envisioned as well as other sources of financing, external to Parliament.

Nonetheless, the last parliamentary proposal by Duarte still places the parliament in control of most of the TA process. Even in this so-called independent model, the coordination board, which holds the initiative power and management role, is exclusively constituted of MPs. Only in the consultation board a wider range of actors (from Government, Science and Society) is considered.

6.2. An inclusive model for TA in Portugal

Bringing those elements into an overall picture depicts a TA model that is situated at the interaction of the Parliamentary sphere and the Science and Technology domain. Consequently, the inclusive modeling of TA Portugal currently points towards a “primarily Science-Parliament involvement” (see also Almeida 2015a) as represented in the illustration below. Society and the Government were largely involved in the processes that have led to the latest proposition. However, both entities are marginally mentioned when it comes to possible funding sources, potentially opening up the possibility for membership in the Advisory Board for representatives of governmental and societal organizations. Because this is only hypothetical, the respective arrows are

pictured with dotted lines. Figure 11 below illustrates the involvement of the different spheres in TA, whereas Table 3 goes into the details of these involvements on the macro, meso and micro levels.

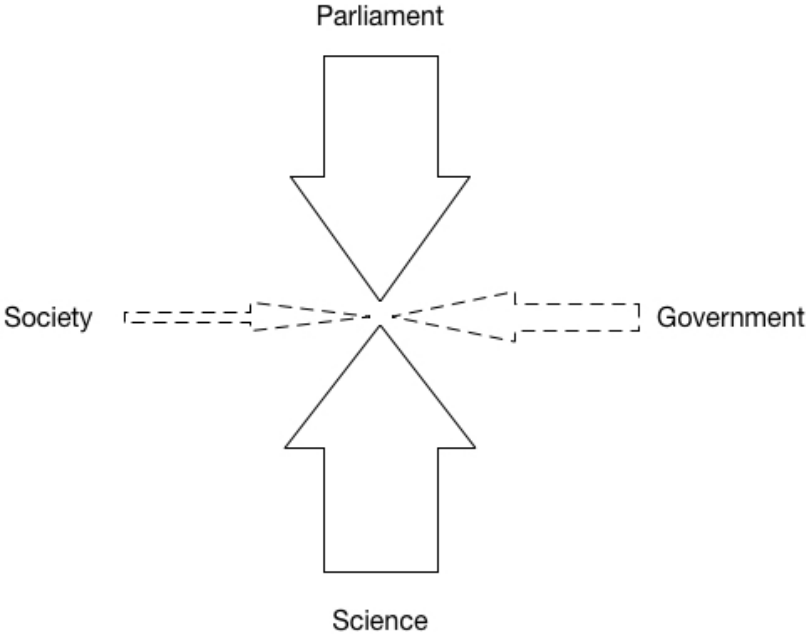


Figure 11: Inclusive modeling of TA in Portugal: primary Science-Parliament involvement

Institutional level	Mission	Inform Parliament (Science-for-Policy)
	Client	Parliament specifically Secondly undefined societal actors (digital library)
	Funding	External / Outside Parliament Under scrutiny of Administration Board of Parliament Possibly government via FCT (no confirmation yet)
	Evaluation	After a pilot-project phase Not specifically mentioned (Parliament – Coordination Committee)
Organizational level	Staff	No mention / Not in Parliament Outsourced to research Library: unsure on staff implications for Parliament or Science
	Board	Coordination board made up entirely of MPs (ideally from all commissions) Advisory Board (open mainly to scientific actors but also to Government and Societal actors to a lesser extend)
	Working procedures	Information gathering by MPs (hearings, consultations, library) Advise by Consultation board Subcontracting work to scientific actors via calls for each issue addressed
Practice level	Projects	Subcontracted to science Project/data transfer via Library
	Staff	Subcontracted to Science (mainly social science and engineering research groups are mentioned) Operation of Library unclear
	Participants	Science mainly Possibly stakeholders and society - not specified
	Advisors	Not specified (see consultation board for propositions and organizational advice)
	Review procedures	Evaluation of the pilot-project Coordination board (only MPs) Possibly scientific peer review and possible review by sponsors?

Table 3: Inclusive modeling at the macro, meso and micro level of TA activities in Portugal

The different concrete organization models pursued over-time show a relative consistency in this mainly dual science-parliament relationship, leaving government and society largely uninvolved in the current process. There is also a tacit consensus around the principle of separation of powers between the legislative and executive branch. The government or the administrations are thus never explicitly mentioned in the hearings. The involvement of Science and Government becomes more important as we progress towards the Independent model proposed by Duarte in 2015 and intended to rely on existing actors' resources and funding schemes outside of Parliament. Accordingly, this last organizational proposition includes a consultation board (issuing non-binding opinions) open to financing entities such as FCT, research institutions such as the State Laboratories, several research units active in TA-like activities and other non-specified societal actors. However, in Duarte's proposal, the Parliament wants to maintain a tight control over the process with a coordination board exclusively made up by MPs.

The digital library is also to be read as another approximation between the mainly scientific TA knowledge providers and the Parliament. The expected use of the library suggests a strong focus on secondary analysis (a classical science-based method mainly consisting of literature review), notably as a cost-saving argument.

Despite some discourses about citizen and stakeholder participation emanating from MPs and auditioned experts, the formal inclusion of the societal sphere remains minimal for most indicators identified by Ganzevles et al. (2014). As the table above suggests, there is nothing foreseen at the institutional (macro) and organizational (meso) level. On an individual project basis public engagement processes may be conducted. Either upstream when proposing topics as proposed by Duarte or by the subcontractor during individual projects as highlighted by Moniz. In the latest proposition, the parliament is the actor that holds the initiative power, suggesting the topics and contracting the actors to conduct the TA studies. They may seek inspiration from hearings or other consultation processes as well as from the digital library but at this stage the possibility for TA practitioners to proactively suggest an issue for TA scrutiny is not foreseen (as it can be the case with the "independent model" of TA). It is only in a second phase that non-parliamentarian actors (mainly scientific ones) are consulted. Once the coordination board sets the contract modalities, the research conduct is left to the executing external entities. The coordination board would review the reports before publication. At the present stage of the endeavor, especially since the latest proposal foresees a to start with a pilot project, it is difficult to distinguish between the general organizational (meso) features of TA and the more particular settings on the ever renewing project level (micro). The insights of these experiments are likely to lead to lead to adaptations in the way the TA process will be organized.

6.3. Use of results in policy-making

The use of the outputs produced by TA so far is difficult to evaluate. It may here again be useful to distinguish between issue-oriented TA projects and engagement oriented activities. In terms of uses, we refer to the impact tables established by the TAMI project (Decker & Ladikas 2004), which distinguishes between different kinds of impact such as initializing actions, raising awareness and forging opinions. The authors also refer to impact outside of the political sphere, namely on the Science and Technology domain and in the societal sphere.

Firstly, regarding issue-centered activities, the GrEAT network has for instance produced a series of research briefs on the basis of on-going PhD research at PDAT. Similarly, the PACITA project also conducted some pilot projects in Portugal: A cross-national future panel bringing together experts and parliamentarians to work on public health genomics and a Europe-wide citizen consultation on sustainable consumption. Considering the product (Van Eijndhoven 1997) character of those TA outputs (reports delivered once the TA study is completed), our research did not find any record of actions initiative in the political sphere related to those issue-centered activities so far.

Secondly, the self-reflexive report about Technology Assessment in Europe commissioned by STOA and delivered by the Technopolis groups (Enzing et al. 2012) is by far the most used and referenced document in the TA debate in Parliament. It was not only used in the Resolution and subsequent documents emanating from the Commission of Education, Science and Culture. It also structured a great deal of the debates between the MPs and auditioned experts. The taxonomies of TA (Parliamentary Unit, Parliamentary Committee, Independent Institution) as produced in this report by Enzing et al. (2012) or former categorizations (Office model, Committee model, interactive model) Hennen & Ladikas (2009) helped to create a common ground of understanding, which allowed the different actors at stake to engage in debate on TA institutionalization and with one another. Those categories served so to speak as “boundary objects” (Star & Griesemer 1989). They were indeed at the same time flexible enough in meaning to accommodate different actors’ interests but nonetheless concrete enough to foster collaborations and result in various operational proposals by the different involved actors.

Finally, we have to consider a series of less issue-centered and more relational or discursive TA activities. Those include for instance the debate and mobilization tasks of the PACITA project. Indeed, international activities such as the Parliamentary debates in Copenhagen (2012) and Lisbon (2014) attracted several Portuguese MPs as well as more national-focused exchanges such as the national workshops “Expanding the TA landscape”. As for some MPS, this was the first time they got in touch with this issue of

TA. Hence such discussion and exchange formats **about** Technology Assessment between scientific experts, policy-makers and international TA professionals may have influenced their understanding of what Technology **is** and **delivers**. Those international events may have slightly biased the MPs understanding of TA activities as mainly debate and exchange venues. Indeed, some of the high expectations towards “imports” of foreign studies and experiences as well as propositions of loose and sporadic “discussion platforms” or networks between scientists and parliamentarians may stem from those particular experiences.

6.4. Cognitive aspects

Besides the prominent preoccupation with organizational forms and questions of which actors are to include and how to do so, institutionalization also concerns cognitive aspects. Those include an analysis of the discourses about TA. How are the needs for TA expressed, by whom and in which context? What rationale should TA fulfill in the concrete context of Portugal. How is it supposed to relate to the way STI policy-making is currently handled? What is expected to change? How do different discourses interact? Which propositions are consensual and which ones may divide the actors engaged in the development of TA? Along which lines do these divisions occur?

Furthermore, this section also addresses the way in which TA possibly makes up a community of practice. How is TA relevant expertise build, requested, sustained and supported and how do the different actors relate to each other?

6.4.1. TA discourses

The following section organizes the discourses held about TA around four main and recurring themes: (a) The increasing strategic importance of STI as a policy domain for Parliament; (b) a linear conception of the relation between science and policy-making in which supposedly neutral and balanced information leads to better, more rational outcomes; (c) the importance of organizing this relationship on a structural rather than an *ad hoc* basis; (d) the issue of public participation (e) a general deficit narrative of STI in Portugal accompanied by high expectations towards transfer of TA knowledge and organizational models; (f) the recurrent reference to budgetary constraints, which puts pressure on TA investments, (g) propositions for international division of TA work; (h) calls for innovative and “light” solutions based on rather loose organizational forms such as network; (i) aided by ICT tools such as online repositories.

Most of those views are rather consensual and only rarely challenged. However, we will indicate relativizations or challenges for some of those views. For instance, we find

individual notes of cautions regarding the expectation for TA to end sociotechnical controversies. The dichotomist picture of PTA and non-PTA countries also gets relativized. At times the austerity argument also gets challenged. The envisioned digital library faces some reserves as to its potential cost-saving character. Finally, the issue of participation is unequally mentioned, understood and reveals political cleavage.

Regardless of their mainly consensual character, Portuguese TA discourses nonetheless reveal some of the politics of TA. The diagnoses of STI governance and proposition of TA to ameliorate this governance are not neutral. Although often presented as such neutral, concrete TA enactments and discourses inevitably taps into certain political narratives, position actors and institutions in relation to each other, invest them with new identities and roles, interact with established power relations. Jasanoff's concept of co-production (2004) captures well how the production and utilization of knowledge is inextricably caught up in particular social and political orders. The studies, reports and diagnoses that aim to identify avenues for TA development in the country thus provide a certain conception of the knowledge-policy relationship. The expectations towards future TA processes and the knowledge it ought to produce are similarly invested with representations of both knowledge and social order.

The increasing interest in TA from Parliament came along with a raising demand of the Assembly to be more involved in Science policy and scientific debates. This policy field had for a long time been considered as sole prerogative of the Government in Portugal. STI gets perceived as an increasingly crucial policy area. The involvement of Parliament with TA goes back to the 2009 "Report about Science" by MP B. Nico for the Standing Committee for Education, Science and Culture. This document looked into "*research and development structures in the country and the importance of R&D investment for economic and social growth*" (Resolution n°60/2009). STI is increasingly invested with considerable expectations for economic development and a way out of the economic crisis. Hence, the Parliament wants to have a say in those matters as well. In an exploratory survey with diverse Portuguese innovation stakeholder, Almeida notes "*the establishment of a structure or unit for technology assessment (TA) that would work specifically for the Parliament was considered by all the interviewers as to be essential for the development of the country on a political, social and economic level*" (Almeida 2012: 237). In this context, TA is expected to help with the prioritization of research policy and to allow for a better fund allocation. The polysemy of the term *avaliação* understood both as evaluation and assessment certainly contributed to such expectations. In line with the general Knowledge-Based Economy discourse, TA is thus put forward as an instrument for making the best STI policy choices for the economic and social development of the country while at the same time minimizing risks and costs associated with poorly planned decisions or in the face of public resistance. The constructive dimension of technology is emphasized and its pretension to create an

innovation friendly socio-political climate. Interviewees mention the context of global competitiveness and the threat of emerging powers for the Portuguese economy. The social dimensions TA ought to take into account are often limited to the objectives of job creation. Furthermore, Santos argues TA would help make Portugal a so-called “knowledge society” and contribute to a new mode of citizenship: a scientifically informed citizenship (2013: 21).

The Portuguese STI governance has been resumed as predominantly “policy-for-science and not science-for-policy” (Almeida (2012: 228). Accordingly, the call for TA resonates with one of the initial rationales for the installation of the Office of Technology Assessment (OTA) in the United States (Vig & Paschen 2000), namely to empower Parliament vis-à-vis government and balance the unevenly distributed access to expertise in favor of the legislative branch so to make it able to participate in S&T activities, debates and policy-making. The MPs themselves feel poorly informed on matters relating to science and technology policy and are demanding more scientific input into their work (see Pereira et al. 2010). Although the majority of MPs have a high level of education, this is generally not in the field of natural sciences or engineering (Pereira et al. 2010). Interviewed MP N. de Sena (Social Democratic Party - PSD) also puts forward this view when she makes reference to the necessity of having holistic, interdisciplinary knowledge available to MPs, because even though every MP has a specialist area of knowledge, he/she cannot be a specialist in every matter. Equipped with a TA capacity, the parliament would be able to play its different roles of venue for debate, governmental control and legislative initiative in the field of STI policy. Indeed, in his hearing Moniz stressed the necessity of having TA activities that are not too close to the administration of the system but can provide objective and truly independent evaluation for the Parliament. Furthermore, M. Heitor (in the parliamentary hearing and subsequent interview) stressed the peculiarities of Parliamentary Technology Assessment compared with TA activities in academia or for the governmental sector. Although broadened to Parliament, much of the discourse remains in line with the discretionary style STI governance (Hagendijk et al. 2005). Accordingly, TA is mainly understood to provide “science for policy” and contribute with evidence provision on “social, environmental and ethical question” (Santos 2013: 21) to “better” policies, thus echoing the narrative of “evidence-based policy-making”. There is a general consensus that increasing the information base of the Parliament with TA knowledge would induce “better” decisions, without explicitly mentioning how they would be improved.

Furthermore, the involved MPs are also unsatisfied with the way scientific advice is mobilized and used in Parliament. In often mentioned socio-technical controversies, there is a desire to work less in a reactive and « *ad hoc* » manner but on a more systematic base. In terms of reflexes and contexts in which it is referred to TA, there is a great overlap between the topics mentioned by both scientists/promoters of

Technology Assessment and Members of Parliament. Most of these issues have a rather local or national scope. The themes of co-incineration, in-vitro fertilization, the siting of the Lisbon airport or the dam construction at *Foz Côa* for instance are reoccurring themes in both scientific articles and interviews with the different actors. Those sociotechnical debates have been described as largely “*polarized and significantly adversarial*” (Boavida & Moniz 2016: 80). According to Pereira et al. (2010), the absence of boundary organizations such as Technology Assessment capacities in the Parliament, renders the engagement processes of MPs in S&T matters rather arbitrary, based on diverse information sources that tend to be used to legitimate already existing positions among pre-established lines of political disagreement. Such situations have also been described as subject to an “agonistic” style of STI governance (Hagendijk et al. 2005). Furthermore, without systematic and trusted information, scientific claims are said to often having been used to support opposing and predefined positions and claims. Almeida makes a similar statement saying that scientific knowledge is often “*used by politicians in a biased manner rather than to [provide] a balanced assessment of different options*” (Almeida, 2012). Interviewed MPs also said that in situations of socio-technical debates, opposing sides mobilize different experts, often leaving MPs puzzled and well-entrenched in party positions. For most interviewees, TA could have played a constructive role in those controversies without expanding how such a constructive role may concretely play out. Boavida and Moniz (2016: 81) for instance state “*an increase in the public perception that scientific uncertainties and controversies relevant to policy making should be mediated by neutral actors.*” Indeed, it is upon similar observations that a series of previous reports (Hagendijk et al 2005, Pereira et al. 2010, Almeida 2012, Böhle & Moniz 2015) recommend establishing a more permanent and consistent structure for addressing these STI issues in Parliament. For most actors, TA is thus expected to overcome the above-mentioned shortcomings by providing more balanced, trusted, shared and recognized expertise. This rather positivistic understanding of TA knowledge as inherently neutral and balanced and the impact it would have on better decisions has rarely been challenged. Some expressed cautions are however noteworthy. In their auditions Moniz et Simões have both stressed during their auditions that TA knowledge does not necessarily provide closure for debates nor is it always able to reconcile opposing viewpoints behind evidence. Moreover, they indicate that TA cannot necessarily provide scientific certainty in all circumstances. Those views and cautions however have not permeated into the latest proposal by MP Duarte.

Both the high expectations in scientific information for better policy-making and the narrow focus on parliamentary activity root the dominant discourses about TA in a rather linear understanding of the Science-Technology and Society relationship. In this paradigm, scientific and technological develop almost autonomously and only have effects on society at later stages (referred above in terms of economic and social improvements). Bijker (2014) shows that this deterministic vision of technology has its

equivalent in TA developments. Dominant in the reactive and early warning function of the first TA generations, this linear conception still remains a core element of present day TA activity and can for instance be found in ELSA (Ethical, Legal, and Social Aspects) approaches today. *“Accordingly, scientists played a dominant and exclusive role in this form of TA, in this context, decision-making was assumed to be organized around a single, clearly identifiable decision-maker (parliament, minister, manager), and it was also assumed that it could be improved by rendering it more rational”* (Bijker 2014: 25).

Besides the consensus on the evidence-based rationale of TA involving mainly scientists and members of parliament, the role of societal participation in TA is unequally mentioned. This consensus is explained in interviews with statements such as *“evidence is the same of everybody”*. As several observers note, the issue of citizen participation in politics and more particularly in issues involving STI is differently supported across the political spectrum. The political left and radical left being more supportive of participation than conservative and right wing parties. It is also perceived as more costly to organize. Therefore, besides general declarations referring to “scientific citizenship” or dissemination of knowledge to citizens, concrete proposals for public participation are almost nonexistent or very vaguely formulated. This is probably due to efforts of maintaining a consensus between the different MPs on the issue of Technology Assessment.

As we have seen, resorting to PTA and much of the discussion has been narrowly framed in the terms of existing organizational models (the often mentioned report by Enzing et al. 2012). This attitude reflects a more general mimetic institutional isomorphism (Dimaggio & Powel 1983). This isomorphism also links up with a generally accounted tendency of following foreign trends in science policy (Almeida 2012), which automatically puts Portugal in a “deficit” position with a lot of “catching up” to do compared with other European countries and especially the so-called “PTA countries” (see PACITA chapter). Beyond this idea, which *“conflates general societal ‘progress’ with technological ‘advance’* (Felt et al. 2007: 73), we have found additional indicators for a “catching-up narrative¹²²”. Rapporteur MP Duarte confesses in an interview that in Portugal, *“we are lagging behind from the point of view of other countries”* (R.P. Duarte). This view is also present in the conclusion of the Santos Report (2013) as well as in the records of the hearings, where almost every expert made reference to the necessity of joining the EPTA in order to benefit from “best practices” in other countries.

¹²² Following Felt et al. (2007), narratives cannot be traced back to particular origins, authors, interest or intentions. They are part of collective imaginaries, associated with material objects and institutional practices and often shape societal futures. *“To the extent that narratives are constituents of already designed and lived social imaginaries, they may lie almost beyond rational debate or deliberate redesign.”* (Felt et al. 2007: 73).

Nonetheless some minority elements relativize the somehow dichotomist picture of TA and non-PTA countries. The results somewhat nuance the dichotomist picture of countries having/not-having Parliamentary TA (see PACITA chapter 1). Strangely enough, the research carried out by the inter-parliamentary research service mentioned in the Santos report (2013) states that apparently some EPTA member countries “do not have Parliamentary Technology Assessment *per se*” (without much explanation Austria and the Netherlands are mentioned¹²³). It also mentions that Belgium and Denmark recently quit the EPTA network¹²⁴. In addition, the chapter mentions several countries, which implemented TA not through organizations or contracts but through a process of expert hearings or through more informal mechanisms such as fora¹²⁵. Regardless of the accuracy of such a report, it nonetheless illustrates a less dichotomist and more complex mindset regarding the PTA situation in other countries. In a different presentation of preliminary versions of this chapter, the author faced questions for other Portuguese researchers such as “*Why do Germans always want to institutionalize everything?*” or “*Why is strong institutionalization necessarily a good thing?*” The researchers were indeed questioning the dedicated, specialized and permanent institutional TA arrangements typical of the EPTA network and described in the PACITA chapter. Some GrEAT members also present the history is TA in the US after the closure of OTA as having been taken up much more distributed and on a case-by-case manner by non-profit organizations, different research centers or on the company level with various funding sources, including industry sponsorship. These alternative and minority discourses will become more prominent as the Parliamentary Unit model is abandoned and more “*light solutions*” (Duarte) are sought.

It is not only the organizational models that should inspire the TA entrepreneurs. There are also high expectations towards the import of TA knowledge produced elsewhere. The deficit narrative also aligns TA on the idea of technology transfer - again, a rather linear understanding of the Science-Society relationship. In this case technologies would develop autonomously in foreign contexts. Only later, in a second phase, those technologies would be introduced in the Portuguese context. This is reflected in

¹²³ As element of clarification that is not present in the report we may add that Austria was only Associate Member at the time. The Netherlands are considered an independent (Enzing et al. 2012) /interactive model (Hennen & Ladikas 2009), which is less bound to Parliament and also pertains links with the Government. This may be the reason of this classification, but it does not make this classification more convincing, as many other TA institutes are in the exact same condition as the Rathenau Institute. However, in the report, they yet qualify as “TA countries”.

¹²⁴ Another element of clarification is the fact that, at the time the inquiry was conducted, Denmark was in a temporary hiatus with a process of re-institutionalization of the Danish Board of Technology. In the meantime, the DBT as a private Foundation has remained a full EPTA member, even if its status and membership have been questioned at times by other members. The Belgian example focuses on a federal body and neglects the regional TA fact, with the existence of the Flemish TA Institute Society and Technology until 2012.

¹²⁵ The author mentions Austria, Slovenia, Estonia, Holland, Canada and the Council of Europe.

expressions such as “technology transfer” or “technology introduction” and more generally in discourses about which “social impacts”, “environmental implications”, “health effects” or economic costs and benefits. Likewise, the consequences of those technology transfers could equally be imported from the countries these developments originate from. Therefore, we find a lot of hopes expressed towards the import of TA knowledge produced elsewhere (by existing institutions in other European countries). Such understanding links up with the TA discourse almost thirty years after Gonçalves & Caraça’s 1987 publication describing the proto-TA activities as blended between developed and developing countries’ understanding of TA. In such a scenario of importation and transfer, the context of those technological developments as well as the framing of assessments is not explicitly reflected. Hence, TA knowledge gets decontextualized and envisioned as easily transportable and usable throughout different national contexts.

During the PACITA Second Parliamentary Debate¹²⁶, F. Veloso¹²⁷ for instance pointed to the fact that some issues might just not be relevant to address on the national level and particularly in the Portuguese context. He refers to the examples such as nanotechnologies or the problem of climate change. According to him, those issues are better off being dealt with on the European (or even international) level - not only because the issues are so broad and international in character but also because they may not draw sufficient attention from national MPs, who, according to him tend to think that everything is decided in “Brussels” (i.e. the European Institutions). On the contrary, he indicated a possible division of labor and specialization of TA activities in Portugal around issues such as coastal and sea special planning as being especially relevant for Portugal. He stresses that in such research areas, Portuguese TA could be on the leading edge. On the contrary, there are not enough resources to indiscriminately work on any possible topic.

This idea of a neutral and straightforward import and use of TA knowledge from other national sources also gets rarely questioned. A minority of researchers sensitive to the historically semi-peripheral condition of Portugal insist on the difference between Technology and Scientific transfer and technology and scientific appropriation. Indeed, the second concept gives more attention to local dimensions and to the transformation process that knowledge and technologies undergo when travelling to other contexts. Such insights questioning the possibility of transferring TA knowledge and whether there is a need for an actual appropriation. Caraça for instance made it clear that is not in favor of a digital library and questioned its low-cost claim. He notably stressed that a

¹²⁶ <http://www.pacitaproject.eu/strengthening-technology-assessment-for-policy-making/> (accessed 13th of April 2017)

¹²⁷ Francisco Veloso is Dean of the Católica-Lisbon School of Business and Economics. He was an invited speaker during PACITA second Parliamentary Debate in Lisbon.

minimum of human and financial resources are nonetheless necessary to have an intelligent reading of those imported reports and render them useful to parliamentarians.

Nonetheless, this argument of division of labor gains additional traction in the current austerity context and general lack of public resources, especially for Parliament. But the consequences of the financial crisis also have other implications on the TA discourses. Indeed, the discussion about installing a TA capacity in Parliament is not high on the political agenda and it is eclipsed by supposedly more urgent issues – the economic crisis being a crucial one in that regard. Some interviewed MPs, although supporting TA, are puzzled about how to “*sell the concept to voters and citizens*”. During the hearing process, MP Marques (PSD) for instance questioned how an investment such as TA could be explained and justified to citizens. While the added value of TA reached a general consensus, in debates in the commission for Science, Education and Culture, MP M. Seufert (CDS-PP) and MP L. Fazenda (Left Bloc - BE) had different opinions on the impact of the budget restrictions and the feasibility of a solution. More generally, the parties on the (radical) left spectrum repeatedly questioned the rationale of budgetary containment. MP R. Rato (Portuguese Communist Party - PCP) even put TA forward as an investment able to save costs, notably in terms of dramatic health consequences that some technological choices entail. MP L. Fazenda (BE) said the context of budgetary containment should be no obstacle of moving forward and called for creative and bottom-up solutions, making reference to the digital library. At the edge of the taxonomy of three classical models (Enzing et al. 2012), the different actors find enough room for original and creative solutions. Those mainly evolve around the idea of using existing resources (from the Parliament and its commissions, and from external actors and European funds) as well as lighter, bureaucratic relations between MPs and scientists, possibly facilitated by Information and Communication Technologies. During Almeida’s hearing, as inspiration, MP Marques (PSD) pointed to technological evolutions (such as ICT) within the Assembly, which had already resulted in more flexibility and a greater connection with citizens in policy-making. Later, the auditioned expert V. Simões suggested more “liquid” forms of relations between the scientific community and policy-makers in the face of the budgetary limitations. During Moniz’s hearing, MP Aguincha (PSD) questioned the hypothesis of a resource-sharing “platform” with relations to the Professor’s team of investigators as an intermediate solution in the current context of budgetary “containment”. MP L. Fazenda (BE) suggested the possibility of a permanent parliamentary working group and the creation of a digital library giving access to information on TA getting support from ongoing initiatives such as the PACITA project and the GrEAT network. Opinions diverge as to whether such a solution would be an acceptable solution or an intermediate step towards a more ambitious organizational model.

6.4.2. Community of practice

The second constitutive element of the cognitive dimension of institutionalization is the way in which the practice makes a community. Varonne & Jacob (2004) have proposed some operational indicators to explore the community building such as the existence of a national society or professional association, the edition of journals, the organization of conferences and other professional meetings, the definition and use of professional standards, as well as a plurality (i.e. different approaches, actors, rationales) or even a (competitive) market for the practice.

Before going into these general dimensions, let's sum up some particularities of the community's traits that have already been identified in the previous sections. At times, it is difficult to delimitate the community both in term of the nature of practices as well as its geographical embeddedness. Firstly, in Portugal the community itself aims at aggregating neighboring practices to reach a critical mass and sufficient expertise. One can clearly speak of plurality of practice because of the different but small research groups that are active in TA-related areas. As we have also seen their strategies for institutionalization also vary and compete. The boundary with foresight, evaluation, systems analysis or engineering is at times difficult to identify and maintain. Secondly, these neighboring practices, as it is the case for STS, have been described as having a semi-peripheral character (Delicado 2013). Besides the catching up narrative this conveys, it also stresses the importance (possibly even the dependence) on international connection and linkages. No wonder then, that established links and contacts are important argumentative resources put forward by actors in their strive for legitimacy or further development (cf. Boavida & Moniz 2016). On the downside, this international character of the community can also potentially play against the structuration (and specialization) of a national-based community of practice, which would concentrate on locally relevant issues.

Besides the focus on the best organizational form for TA in Portugal, another important strategy pursued for the advancement of TA in Portugal is the institutionalization of practices. In this area it is mainly A. Moniz that has an explicit agenda of development and federation of practices. The groups he coordinates (the GrEAT network, the PhD program and the TA observatory) indeed meet a number of criteria identified by Varonne & Jacob (2004) to foster a community of practice. At first, there is the annual series of conferences organized (winter schools and doctoral conference) with invited keynote speakers and PhD students presenting their research results. The GrEAT network, although deliberately loosely structured, issues certain publications: the so-called *tópicos*, research briefs about some of its research topics as well as the journal "Enterprise and Work Innovation Studies" and the "IET Working Paper series". The latter offers an additional although non-exclusive publication platform to the GrEAT and

PDAT members. There is no one specific quality criteria or standards for the TA practice. The PhD students are subject to classical peer evaluation for their dissertation and to a possible *ex ante* evaluation in the case of grant applications. However, the coordinator encourages them to acquire additional soft-skills during their PhD curriculum such as organizing conferences, popularizing their research topics in accessible language and format. Those can be considered additional assets for the TA practices, that are not necessarily included in a typical PhD curriculum.

The lack of structural funding (for continuous baseline activities and/or collective research) and the main voluntary investment in the community however holds the risk that the community cannot hold all of its practitioners on the long run. The approximation efforts with Parliament are also to be understood as an additional speculative way of obtaining funding (directly through parliament and later via third party funding but mandated and additionally legitimized by parliament). The recently created OAT at CICS.NOVA gives some researchers to possibility to continue TA research after the PhD. Like the GrEAT network is aimed at further consolidating the community by fostering national activities and international networking ambitions. It also has the ambition to fulfill a memory function for TA knowledge by linking several academic research repositories, translating foreign TA reports and stocking the different achievements of GrEAT the and PDAT. However, the program is also conceived for the graduates to enter the labor market or hypothetically “go back” to their initial working environments with improved analytical and decision-making skills or integrate positions distributed in many different decision-making or analytical areas in both private and public, national and international organizations. Until today it is unclear how the graduates continue to make community after the completion of their curriculum. Hence, the temptation to move on to other practices and their respective communities it a real risk - especially if those communities have more structural and continuous resources at their disposal. It is furthermore difficult to keep the qualified TA researchers in the country with little formal demand and funding possibilities. Several PDAT students have notably moved to ITAS in Karlsruhe Germany to continue doing TA research.

7. Case discussion and intermediate conclusion

Throughout the last years the wish to install a Technology Assessment facility in the Portuguese Parliament has considerably evolved and taken different pathways. Although the inclusive modeling shows a persistence of TA that involves mainly the scientific and parliamentary spheres, the concrete organizational setup was subject to the interplay of different actors as well as shaped by particular framework conditions, in particular the economic crisis.

Firstly, the different actors at play had sometimes opposing views on the best organizational model to pursue. The taxonomy of Enzing et al. (2012) has been invested with various meanings and sometimes stretched to accommodate particular interests and constraints. The same goes for other existing PTA organizations from abroad that served as inspirations – sometimes with accounts that tend to selectively highlight traits of particular European TA organizations (such as POST or TAB) or even rewrite the history of particular organizations (like the US OTA). More generally speaking the narrative of “catching up” with the rest of Europe has played an important role in the discussion about TA.

Secondly, these different organizational propositions hold particular conceptions of knowledge and the process of political decision-making. Generally speaking, the first attempt at erecting a Parliamentary TA Unit as formulated in the 2009 resolution and the subsequent the Santos report (2013) was grounded in a very “modern” understanding of the science-policy nexus. Indeed, this TA proposition was designed to work for a single, clearly identified addressee: the national Parliament. Numerous interviewees highlighted the importance of having a specific Parliamentary TA and stressed its peculiarities opposed to other forms of TA (academic TA, participatory TA, TA in the industry or TA-functions with the executive branch). Furthermore, it fully embraced the evidence-based policy-making rationale, where “better” and “increased” scientific input leads directly to “better”, “more rational” political decisions. This proposition did not give much attention to the contextual and local dimensions of knowledge. It rather built on the assumption that scientific research would simply feed into political processes. This reflects a rather linear and technocratic understanding of the relationship between technologies and society, wherein consequences of precedent technological choices need to be analyzed and possibly anticipated in an early-warning fashion to inform clearly identified policy-makers in order to take action. This model does not consider situations of uncertainty, scientific controversies or ignorance. Nor does it take into account additional public and private decision-makers at different levels of power.

At the beginning of the PACITA project, the Portuguese partner has aligned with such a linear, evidence-based view. However, in the course of the project and in the face of the failure of the model proposed in the resolution, the ITQB team led by M. Almeida increasingly nuanced its view and shifted its strategy and discourse about TA. On the policy side, increasing attention was given to “intermediate actors” and stakeholders in a broader approach of the STI governance. University Rectors, former Secretaries of state and leading research institutions got consulted and associated in the discussions about establishing TA facilities in Portugal. Furthermore, on the knowledge side, significant efforts were made to organize the so-called “relational expertise” that is distributed

among several uncoordinated actors throughout the country. These efforts in gathering and putting together relevant expertise are also to be put in relation to the little capacity for actual TA research the ITQB team itself had. Additional reflection went into communication channels and formats between scientists and Parliamentarians and how to concretely organize the interplay between Science and Parliament.

The group led by A. Moniz (PDAT, GrEAT & OAT) was originally rooted in quite a distributed, multi-level, public and private understanding of governance as reflected in the direction the PDAT was giving to the career possibilities of its graduates. However, a non-exclusive relationship to Parliament was progressively built up, which led the GrEAT network to suggest an alternative organizational model in its memorandum. Although a number of the PDAT students also endorse an evidence-based approach to decision-making, we find evidence of more nuanced and post-positivistic understanding of knowledge among some members of this group (hinting inevitable uncertainties and controversies of some scientific and technological domains and the fact that political uptake of scientific insights is not a straightforward process, thereby questioning the very possibility of evidence-based policy-making).

The Parliament, and more particularly the Commission of Education, Culture and Science have oriented and captured the TA project exclusively around the Parliament. The MPs hold high expectations towards research to inform them and expect it to render their legislative work easier and their own decisions more rational. They unanimously want to avoid past controversies and *ad hoc* operating modes in the future and thus wish to systematize the recourse to evidence as a way of disciplining their own operating modes.

The final proposal by Duarte was the latest attempt at synthesizing the different viewpoints. His efforts were notably conditioned by two important framework conditions: the context of lack of financial resources and the will to maintain a political consensus around the project to equip the Parliament with a TA function to empower it in S&T decision-making. But what visions of knowledge and policy-making result from this reformulation? As described above, the Parliament holds a tight control over the TA process. This resembles very much the “modern”, single addressee and command and control understanding of policy-making. However, it distinguishes itself from the Committee model that was temporarily operational and envisioned as a long-term solution. For instance, it took up the suggestions of several auditioned experts who highlighted that TA potentially addresses more policy areas than just the competences of the Commission of Education, Culture and Science. Subsequently the board of administration would be exclusively composed of MPs representing all the different committees of the legislative assembly. The small opening towards multi-actors governance continued with a slight opening of the consultation board. Here previously

unconsidered actors have entered the scene. The proposition opens up the consultation board to representatives of the government, civil society and industry. This is true not only for an advisory role in the definition of a project but also for possible financing of TA projects given the absence of resources from Parliament. Much of this issue-definition work is done by people organizationally and geographically dispersed and only brought together for the occasion of the board meetings. There is basically no secretariat or permanent staff planned in this model. The proposition thus takes up a more networked form of relationship between the different actors. Outsourcing TA studies makes the whole process increasingly project-based as financing entities as well as subcontractors may vary on a case-to-case basis.

On the knowledge axis, the evidence-based approach prevails. However, compared to a unilateral problem definition by solely parliamentarians (committee model) or exclusively done by researchers (Topics by GrEAT), the coordination board assisted by the consultation board has the possibility to define the research tender in a more problem-oriented, interdisciplinary and policy-relevant way. The digital library however conveys another conception of knowledge. Here TA knowledge is viewed as universal, non-contextual and transportable between countries. The framing conditions and original context-related research questions are not reflected upon. The main idea is to profit from work being done elsewhere to save costs or justified with the supranational nature of some technological developments. Indeed, international support and EPTA membership are invested with critical importance. By compiling foreign TA documents as well as productions from TA-like research (STS, foresight, evaluation, innovation economics, technology management and transfer etc.) the library idea shows little sensitivity for context sensitive problem-framing or the “encultured” nature of such knowledge. It is to be noted that such documents were not originally designed or tailored for Portuguese members of the national Parliament. This gives the impression that there are no additional efforts required to render this information useful to the MPs as if it could directly be understood and subsequently used to legislate. This echoes the idea of universal evidence or “hard” and “fast” knowledge described by Waterton & Wynne (2004).

Obviously, the GrEAT memorandum largely inspired that last proposal from Duarte. Two main drivers guided this reformulation are the context of austerity and the pursuit for continuous consensus among the MPs. Indeed, since the economic crisis, the budgetary argument has played an important role in the way the TA project has been shaped (or downsized) throughout the years. It forced the MPs and auditioned experts to look for innovative and low-cost solutions. Eventually the idea of relying on existing, second-hand data along with an international division of labor or subsidiarity gained increasing support. In several interviews it became clear how certain aspects of TA could reveal political cleavages. Several accounts show that the issue of participation is a

particularly polarizing topic between the political Left and the Right¹²⁸. On the contrary, the evidence-based approach rallies the MPs of all parties. It furthermore assigns clearly defined roles to politicians and scientists, which both sides accept without much questioning. When asked about the broad (but superficial) political consensus around the TA project, an observer ironically wondered: “*Who can be against evidence?*” With the present TA proposal, the Parliament becomes yet an additional venue where discretionary governance (Hagendijk et al. 2005) is enacted - as opposed to past agonistic features of STI governance or to no involvement of the Parliament in STI policy at all.

The model of TA put forward by Moniz and the GrEAT network strongly resembles different networked, project-based, and virtual TA models, which have been described in the theoretical chapter. So far, such models are only kept at the stage of visions emanating from the international TA community but they have not yet been concretely realized. In those visions, such a Portuguese model would fully live up to a post-positivistic conception of knowledge and embrace a multi-level, multi-actors notion of governance.

Looking more closely at some of the features of the Portuguese case, we see how equivocal some aspects of the opened-up or reflexive TA approach are. Indeed, the Portuguese example shows that the subsidiarity argument (Bijker 2014) can be used to opt for unambitious and cheap solutions where whatsoever knowledge is simply imported. The same goes for the virtual or science 2.0 approach of TA. Initially conceived as a complementary evolution of TA organizations actually provided with human and financial resources, in the future of TA it may become an end in itself. At least in the Portuguese case, the digital library may become the only permanent organization with minimal and uncertain staff and a coordination and support board that only meet sporadically.

In the present case, we can actually see how this network model is soluble in a positivistic evidence-based approach of an organization working for the Parliament as a single, pre-identified addressee. Although numerous actors, including members of the GrEAT network, stressed the limitations and shortcomings of such a model, the framework conditions contributed to “recuperate” the idea of a networked, project-based and virtual TA as a common ground for the involved actors. In the present case, the network model is thus invested as a low-cost solution delivering so-called “objective” and “universal” science to parliament for “better” and “more rational”

¹²⁸ Digging even deeper, one can see among proponents of participation different conceptions of citizenship, participation and the polity more broadly. Those range from individual citizens in consensus-oriented polity or participation as collective and associative action in much more antagonistic views of politics.

decisions. This leads us to reconsider the coupling of the opening up and reflexivity of the practice TA with its different organizational forms. In this case study, the networked TA has been “recuperated” (Boltanski & Chiapello 2005, Söderberg & Delfanti 2016) by a parliament-centered and evidence-based approach. In the present case those declared more advanced organizational forms (networks, digital solution) find themselves inscribed in conceptions of knowledge and policy-making, from which numerous other European TA institutes, including those from the PACITA consortium, try to move away from.

CHAPTER 5 - The selective uptake and hybridization of TA as organizational strategy. Institutionalization of TA in the Czech Republic

1. Introduction

The Czech Republic holds a certain tradition in Technology Assessment. Since 1980 several actors have touched upon competences and rationales that resemble Technology Assessment in different regards – often however without explicit reference to the concept as such. Over time the approach has shifted from an isolated and rather theoretical and academic activity to a stronger practical focus on innovation and STI governance along with efforts to interconnect different actors engaged with the practice. After past failures to institutionalize PTA as we know it from Western Europe, we will attempt to characterize the peculiarity of current efforts at institutionalization.

Besides references and inspiration from existing PTA practices and organizations (as represented in EPTA for instance), Czech developments arguably contribute to transform the way TA is carried out and may be institutionalized. This is reflected in discourses that replace the so-called deficit or evolutionary narrative. It notably includes a selective uptake of TA rationales and methods, revisiting existing taxonomies like for the Portuguese case, emphasizing possible combinations or merging with other practices and insisting on process (-management) equivalence with other TA practices and organizations. Applying an inclusive modeling approach reveals a predominant Government-Science involvement in TA with limited societal involvement, mainly in the form of participation of certain stakeholders' groups.

The involvement of those different spheres of activities shows a certain acquaintance with distributed multi-level governance. However, the evidence-based (science for policy) rationale is not fundamentally challenged. Furthermore, the kind of knowledge and input requested puts ethical, legal, social issues (ELSI) and more generally considerations for negative implications of technology to the periphery for the sake of strategic information in order to prioritize STI policies that speak to an overall objective of “economization”.

Elements of both product and process approaches complement one another in current institutionalization strategies. The product dimension encompasses issue-centered assessments inspired by a conception of TA as the delivery of “products”. The outputs produced mainly take the form of reports and are designed according to a linear “science-for-policy” understanding. Furthermore, the expected impacts would result in

initializing action in the political field. In parallel, the Technology Centre at the Academy of Sciences of the Czech Republic also invested efforts in creating networks, engaging with a series of stakeholders to create a support base for TA (or “platform” for TA) and build up additional “relational expertise”. By doing so it intends to establish itself as a central and legitimate actor capable of mobilizing relevant expertise and actors for TA if needed. The practice of TA is here seen as way to (temporarily) extend the network of practices. It allows for new collaborations and avenues for the TC’s work on a temporal project basis. Traditional boundaries between practices and disciplines are transcended and creatively combined so too fast and flexibly organize and deliver knowledge for policy making.

Finally, the merging of TA with other similar activities does not only raise issues of quality control, it is also at the center of a double and paradoxical dynamic. Adopting TA rationales and methods indeed contributed to “broaden innovation” (Van Oudheusden et al. 2015) by taking into account a series of neglected dimensions and viewpoints and more value sensitivity, by adding new approaches (notably participatory) and addressees to a methodological repertoire already consisting of policy analysis, evaluation and foresight. At the same time, the merging also runs the risk to align TA with more instrumental approaches, where it risks being “recuperated” for the sake of (uncritical) innovation governance and rationalization of the STI system.

2. Methodology

The following case study aims to describe and analyze the recent efforts and prospects for institutionalization of *Policy-oriented Technology Assessment* in the Czech Republic. It builds on data gathered through (1) literature analysis and (2) semi-directive interviews conducted with a series of Czech personalities active and knowledgeable in the field of Technology Assessment as well as participants in different (pilot) TA activities.

In preparation for the fieldwork, we looked for Czech actors in TA project databases (such as the Technology Assessment Portal¹²⁹, the EPTA project page¹³⁰, the ETAG¹³¹ consortium) and TA publications (notably the repository of ITAS/KIT¹³²) mentioning the Czech Republic. As a result, we found several players that have been active, notably in the field of technology assessment since the 1980s. As a matter of fact, all of them have been linked to the Czech Academy of Sciences.

Those actors are:

¹²⁹ www.technology-assessment.info (accessed 17th of April 2017)

¹³⁰ <http://www.eptanetwork.org/> (accessed 17th of April 2017)

¹³¹ <http://www.itas.kit.edu/english/etag.php> (accessed 17th of April 2017)

¹³² <http://www.itas.kit.edu/english/publications.php> (accessed 17th of April 2017)

- The Centre for Science and Technology in Society Studies (STSS) with the Philosophical Institute of the Academy of Sciences.
- The Prague Institute of Advanced Studies (PIAS).
- The Technology Centre with the Czech Academy of Sciences (TC ASCR) and notably the Department of Strategic Studies (STRAST).
- In addition, several sources (Banse 2000a, Pokorný et al. 2012) also indicate more specialized or sectorial TA and TA-like activities.

The data for the present case study has been gathered during a one-month research stay¹³³ with the Technology Centre at the Academy of Sciences of the Czech Republic. It comprises both a series of interviews as well as an insertion as observer into the research center as such. This involved a series of meetings, presentations and other usual business (at the time both TC staffers and the author were working on the PACITA project and notably exchanged and collaborated in that regard).

In addition to the above identified actors and projects, we took the Czech host institution as a starting point for the exploration of current TA institutionalization in the Czech Republic. This implied further mapping the genealogy of TA activities and actors as well as outlining future prospects for TA in the Czech context. In this regard, the Technology Centre presently plays an important role in the development of TA in the Czech Republic. Hence, after a more historical overview of TA in the Czech Republic, a significant portion of the research focused more narrowly on this particular actor and more specifically on its Department of Strategic Studies (STRAST).

The present work aims to aggregate the main findings of previous research efforts and adds an additional layer by putting them into historical perspective and focusing more narrowly on the current situation and development. Banse et al. (2000a) already carried out an exhaustive mapping of TA-related activities. Pokorný et al. (2012) engaged in a standardized inquiry with a predefined set of potentially relevant stakeholders¹³⁴ (research and academia, legislative and executive branches, advisory bodies, media and civil society organizations) in the framework of the PACITA project. The objective of these authors was to “test” their reception (independently from their knowledge about it) of the concept and grasp the barriers, opportunities and strategies for intervention. In contrast, the objective pursued in this chapter is rather complementary to such

¹³³ The collaboration took place within a bilateral exchange agreement entitled “The next steps towards institutionalized Technology Assessment practices - Mutual learning from Czech and Walloon Case Studies”. The one-month research stay in Prague has been complemented with a weeklong visit of a Czech project-manager in Liège (B) summing up with a workshop addressing the issue of institutionalization of TA and foresight in the Walloon and Czech contexts from both observer and actor perspectives.

¹³⁴ Those were inspired by the identified factors that lead to previous institutional creations of TA organizations in Europe and the United States and thus giving voice to the different actors that are perceived as traditionally having played a role in the offset of TA practices and institutions in the West.

approaches as it aims to provide a comprehensive account of particular ways and strategies in which TA is currently being put forward in the Czech National context. More particularly, it aims to understand the strategy, ambition and current context of institutionalization efforts of the Technology Centre regarding TA. This account will, in a second phase, be compared to former initiatives, their respective context and driving actors.

Compared to the two other case studies of this thesis and despite our efforts in contacting them, an important difference is the absence of parliamentarians in the list of interviewees. This may be explained by a number of reasons. First, there was no concrete proposal, text or reference person in Parliament that could help identifying relevant MPs. Secondly, very few MPs are knowledgeable or have been involved in any sort of TA activity (such as the PACITA conference, Parliamentary debates, National Workshop). Thirdly, those MPs were extremely difficult to address. Either they were not in office anymore, or they didn't respond or declined the interview requests. In conclusion, we had to rely on second hand sources for information relating to policy-makers (articles or interview and debate transcripts produced by the TC in the framework of PACITA activities).

Given the difficulty to involve parliamentarians in our research, we established, with the help of TC, a list of reference people that had been involved in different recent TA activities. The profiles of such actors and their forms of engagement with TA activities are quite diverse: keynotes of former ministers, conference participation by stakeholders, paper submissions by researchers, expert input on particular pilot projects, participation of practitioners in education activities, facilitation or participation in participatory exercises, project managers gathering expertise and outsourcing of some work, taking part in debates organized around TA etc. Generally speaking, we can say that this diversity of actors however, even without the direct involvement of MPs, reflects quite well what has been labeled the Czech "TA scene" (Banse 2000b).

3. Introduction to the Czech political, STI and social context

When addressing the issue of TA institutionalization in the Czech Republic a few contextual peculiarities first need to be addressed. At first, a certain number of studies (Banse et al. 2000a; Hennen & Nierling 2014, Hebokova et al. 2016) have demonstrated a tendency to group the Czech Republic with other countries of Central and Eastern Europe with supposedly similar attributes. Such common traits include a relatively young democracy after decades as soviet satellite state. They also share a relatively young membership with the European Union. After the Velvet Revolution, it is also often made reference to the Czech Republic as a transition country, to qualify the on-going

transformations of the economic, technological and social sectors of the country which continued with the dissolution of Czechoslovakia into two separate countries beginning of the 1990s. The return to liberal democracy took the form of a multi-party, bi-cameral parliamentary republic with a President as head of state and a Prime Minister as head of government.

Currently, the STI policy-making is fairly centralized on the governmental side and regulated according to different STI competences. Regions do not have binding responsibilities in RDI policy but some of them have launched their own R&D policy initiatives. The recently created Council for Research, Development and Innovation (CRDI), composed of representatives of the Academy of Sciences, higher education, industry, and other institutions nominated by the Government handles the overall coordination. It is chaired by the Deputy Prime Minister for Science, Research and Innovation. This expert and advisory government body for strategy and coordination of RDI policies de facto acts as a “virtual science ministry” (Pokorny et al. 2012: 96).

Then there is a series more specific and mission centered Ministries and Agencies coordinating and funding research in the Czech Republic. Those include the Ministry of Youth, Education and Sports (MEYS) in charge of Universities; the Science Foundation (GA CR) providing grants for basic research; the Ministry of Industry and Trade funding applied research on project basis; as well as the Technology Agency (TA CR) providing project based funding for applied research. Some Ministries hold also minor research budgets but thematic funding is generally considered underdeveloped (Pokorny et al 2012).

The Czech Parliamentary system has two assemblies: the Senate and the Chamber of Deputies. Science, Technology and Innovation issues are primarily dealt with in the Committee on Education, Science, Culture, Human Rights and Petitions within the Senate or the Committee on Science, Education, Culture, Youth and Sports in the Chamber of Deputies. However, most sources account for a very minor role, fragmented competences and lack interest of Parliament in STI debates and decision-making (Pokorny et al. 2013).

Finally, there is the Academy of Sciences (ASCR) as a separate institution in the STI landscape. It has its own separate budgetary funding line in the public budget and channels these resources to its current 54 formally independent institutes (Pokorny et al. 2012; Srolec & Szkuta 2016). The majority of public funds is allocated to the Academy of Sciences and the MEYS. Traditionally, the STI system was marked by a strong differentiation between the academies, and universities (Mayntz 1998: 1-2). In former communist countries, the Academies of Sciences have been crucial institutions in the knowledge production regime. Also in the Czech Republic, it remains a particular

strident institution to look at for understanding the transformations of the STI system. Their special place in the research landscape allows representatives of the ASCR to *“lobby the decision-making bodies when deciding about the amount of public funding for R&D or when passing important laws or other legislative regulations in the area of R&D”* (Pokorny et al. 2012). They also continue to play a significant role as *“expert advisors”* (Mayntz 1998). However, Filacek accounts for a problem in the connection between scientific experts and policy-making. *“An abyss opened up between the expert and democratic aspects during the previous communist regime in this country. At present expert opinions are known to have only limited impact on political decision-making [...] in any case the impact is smaller than customary in the advanced countries of the European Union.”* (Filacek 2013a: 148).

The overthrow of the communist regime *“however “undermined the basic logic of the academy model of research organization”* (Mayntz 1998: 3). As other societal subsystems, research increasingly gained autonomy over central control. One important and ongoing reform is the progressive shift from institutional funding to an increase of competitive funding. Recently the STI policy has been subject to several changes and reforms in recent years. Those notably include successive waves of liberalization and privatization followed by periods of budget cuts. This affected notably capacity of planning ahead and making future-oriented investments and rendered STI governance increasingly accountable to external actors. The overall process, has been described a complex, multifaceted and irregular, i.e. lacking consistency and subject to rapidly changing policies.

These changes have all affected the Academy of Science. The deconstruction of governmental control and bureaucracy and the necessity of composing with scarce financial resources have led to contradictory effects: On the one hand academies have broadened their scope of activities with increased independence. On the other hand, financial restrictions have restricted this scope, notably by reducing the overall research capacity and reducing the number of sectorial institutes for applied research (Pokorny et al. 2012). The countries STI landscape has notably witnessed two waves of *“big privatisation”* in the enterprise sector and research institutes, which resulted in cuts in R&D expenses to reduce costs. (Filacek 2013a: 135). For a long time, priority was given to *“economic survival [on the world market] and the avoidance of social unrest, leaving little room for future-oriented investments”* and instead *“offering cheap labor for mass production rather than by high-tech production and innovation”* (Mayntz 1998: 3). This trend has continued with cuts in public expenditure for science and R&D in the wake of austerity measures following the financial crisis of 2008. Simultaneously, basic and fundamental research has been challenged and progressively disinvested. Today there is almost the same share of public and private investments in R&D. As a consequence, some institutes have looked for new sources of income and engaged in commercial

activities. Machleidt particularly identifies the Academy of Sciences as *“contributing to the improvement of the transfer of knowledge by finding new forms of cooperation with industry, namely by founding spin-off companies.”* (Machleidt 2011: 198). Also European funds and co-operations will become of crucial importance such as *“the integration of the Czech science and R&D sector into the European Research Area constitutes the key goal of the transformation in the Czech society in this field”* (Filacek 2013b:1). This notably includes *“‘catching up’ of standards applied to the functioning of the science and research systems in advanced European countries”* (Filacek 2013b: 1). In this sense, the discourse of the knowledge society has significantly gained traction in several governmental programs aiming to improve Czech international competitiveness (Machleidt 2011).

As Filacek points out, the liberalization process is reflected in the STI governance, where a *“considerable rise in the number of managerial and decision-making subjects (stakeholders) [...] actively assert their influence on the research focus of scientific programs. These stakeholders are interested in economical and efficient spending of financial sources, thus bringing pressure to bear on the investments into research to yield demonstrably beneficial results.”* (2013a: 9). Taken together those changes have the paradox effect that *“the research sector cannot formulate its thematic priorities in research quite independently; it is obliged to take into consideration societal demand, social relevance and economic-political interests of the stakeholders”* (Filacek 2013a: 140). Hence, the Czech science regime can be described as becoming increasingly strategic, i.e. accountable for its economic and social relevance (Rip 2002).

The changes in the Science and Education system did not go uncontested. Debates concerned with the above mentioned reforms have led to broader societal discussions on the role of education, science and technology within the Czech Society (Filacek 2011). However, the main actors in those debates were the scientific community (nonetheless giving birth to broader social movements), educational institutions, the public administration and industry. Reforms in the educational and scientific sectors also served as a proxy for broader debates on public management. Other, less noticeable social debates about STI issues were probably climate change, energy and environmental issues such as biomass, solar and nuclear energy (Filacek 2013a, Pokorny et al. 2013). As some interviewees pointed out, the prominence of these topics may perhaps be linked to some climate-skeptic positions of former President Václav Klaus. Filacek (2013b) also mentions relatively contained debates about genetically modified organisms, food chain security and consumer safety.

Besides those form of “uninvited” participation (Wehling 2012), the MASIS (Monitoring Activities on Science in Society) country report on the CR (Filacek 2013a) accounts for no formal mechanisms for public engagement in the field of Science, Technology and Innovation. Such mechanisms are also scarce for other sectors of social life as well

(petitions for instance). Furthermore, *“the issues of inclusive governance and public engagement in science have low saliency.”* (Mejlgaard et al. 2012: 41). Upstream engagement is reported to be mainly discussed in certain academic circles and among professional science communicators. The MASIS Czech national report mentions a lack of national funding sources for “Science in Society” activities.

Generally speaking, the Czech Society has been described as rather technophile and considering scientists as trustworthy (Machleidt 2013). Additionally, the low public involvement is also often explained by a relatively weak and young civil society as a legacy of the repression of political contestation by the communist regime. Some additional peculiarities stemming from this transition context and legacy of the communist regime are worthwhile to note. In several observed TA debates, the notion of independence in policy advice for instance is (at least implicitly) understood as independence from the state whereas in many of the “older” EU member states and “PTA countries” with a longer liberal tradition the same notion is primarily understood as distance from particular, vested (stakeholder) interests and processes of lobbying as there are often safeguards for independence from the state.

The public perception of some prospective studies also suffers from a bad reputation inherited from the socialist period. According to interviewees, this tradition continues to ambiguously connote certain practices and reflexes. Forward-looking activities are described to have a hard time. They are caught between a negative image inherited from the socialist experience (because associated with central state planning) and current short-sighted policy priorities and ever-changing frameworks in the so-called transition phase. We will later also come back to the prognostic tradition and the (discussed) scientific status of foresight.

4. Presentation of the historical TA Actors in Czech Republic

There have been three main organizations active in Technology Assessment in the Czech Republic. Before presenting them in chronological order, we also want to have a more systematic look at the landscape of TA and TA-related activities.

Although more than a decade apart, two main studies, “TA East” (Banse 2000a) and the explorative country study of the Czech Republic in the PACITA report “Expanding the TA landscape” (Pokorný et al. 2012) have listed TA-related actors and activities in the Czech Republic, a significant part of them are sectorial or specialized TA-like research or training activities. Such activities included for instance interdisciplinary *“Systems-Auditors [...] at the University of Pardubice [following] a holistic approach to the processes of industrial planning (i.e., by taking political, social, health, economic, technical, and environment aspects into consideration).”* (Banse et al. 2000b: 13). Pechan (1996) also

accounts for a group a Czech Technical University (CTU) focusing on the implications of transportation and communication technologies as well as a Future Studies Program looking into social and economic aspects, risks and acceptability of new technologies by the University of Economics in Prague. In addition, Pokorný et al. (2013) also mention the - Centre for Social and Economic Strategies at Charles University (CESES) and the Charles University Environment Centre (CUEC) as well as the Council on Health Technology Assessment and Czech HTA group coordinated by V. Rogalewicz (CTU). Through PACITA activities and contacts from the TC staff, we found additional TA-like activities in the University of West-Bohemia, where J. Romportl and his team who specialize in TA on Robotics at department level. The PACITA inventory also mentions Environmental Impact Assessment (EIA) and other legal imperatives such as Regulatory Impact Assessment (RIA) or Ethical Assessment linked to European projects.

In the late 1990s these TA-like activities were considered as *“often unsystematic or uncoordinated, and dependent on single individuals”* (Banse 2000a: 15-16). This diagnosis is still relevant to some extent today. Pokorný et al. (2013) make the same diagnosis of lack of cooperation and coordination and identify an additional funding problem of *“individual projects, and there are no provisions for their continuity”* (2013: 105). However, this listing acknowledges the fact that *“not only preliminary work has been done [...] but there are also competences available”* (Banse 2000a: 17). However, the practice itself indeed struggled with denominations of practices, language barriers, a small knowledge base, problem of continuity and central memory of past experiences as well as on-going consequences of a long academic isolation still perpetuated in access problems to journals and repositories. Externally, because the on-going radical economic, technological and societal transformations (or transition) there was no *“practical political, legal, or institutional support for TA, except for expressions of will”* (Banse 2000a: 16) as well as little support from the population and little public debate about technological developments. In addition, these mainly sectorial and specialized activities cannot really be considered policy-oriented TA. Much of those undertakings remained purely research activities. From our exchanges with Rompotl and Rogalewicz for instance, we can affirm that the TA on robotics of Health Technology Assessment come closer to “industrial” or “private” TA (Loveridge 1996) as these assessment concerns very well defined and specialized technologies in their field of use and not so much the *“wide and large issues relating to science policy”* (Loveridge 1996: 7).

Parts of those former diagnoses and status quo described in former studies (Machleidt et al, 2000; Banse et al. 2000a) are still valid to some extent today, particularly regarding the distributed and uncoordinated nature of activities, the original approach to the practice of TA, the difficulty to formally address Parliament and a civic culture marked by unconditional support to science. Nonetheless, with the relative weight shift of TA activities between actors and the emergence of new players, some elements are also

subject to change. We will review 3 main historical actors and reflect on those changes and their effects before focusing more narrowly on the current activities taking place at the TC. The Centre on Studies of Science, Technology in Society (STSS), the Prague Institute of Advanced Studies (PIAS) and the Technology Centre (TC ASCR) all pursued (sometimes overlapping) different approaches and established synergies with their “classical” or “traditional” activities. STSS and TC mutually refer to one another in terms of successive generations. Those generations all borrow different elements of neighboring practices, build on different disciplines, create synergies with the organizations that house them, bear particular addressees and objectives in mind and give certain directionality to TA.

The first generation at the STSS can be briefly described as very theoretical, mainly in the field of Philosophy, Ethics, Social Sciences and STS. Considered mainly Academic TA, their relation to policy-making was very limited. However, as philosophers, they contributed to introduce the concept in the Czech Republic and engaged first in international exchanges on the issue. With PIAS, TA momentarily tried to become more policy-oriented by approaching the Czech Parliament and sending Czech representatives to EPTA meetings. It also contributed to make TA more innovation oriented and closer to industry. The latest generation, represented by the TC is perceived by both TC staffers and STSS seniors to focus much more on the practice and policy side of TA, contrarily to the earlier and more theoretical approach of STSS. The Parliament however remains largely out of the contemporary picture.

4.1 Centre on Studies of Science, Technology in Society

Technology Assessment was first mentioned in the context of the Czech Republic (still Czechoslovakia at the time) back in the 1980s. The interest with TA started with an interest of philosophy and history of science and Technology as well as science policy by Prof. L. Tondl. He is considered to be the initiator of “*social assessment of technical facilities and technical solutions*” in the Czech Republic (Banse et al. 2000b: 1-2) and by extension viewed as the founding father of TA in the Czech Republic (Pechan 1996, Banse et al. 2000b). In the Philosophical Institute of the Czech Academy of Sciences, he ran a research Centre on Studies of Science and Technology on Society (STSS). On its website, the center describes itself as follows: “*The Centre for Science, Technology, and Society Studies conducts systematic interdisciplinary research into mutual relationships of science, technology, and society. Research is based on the broad theoretical background of philosophy, economy, and sociology (of science and technology), innovation studies, science policy studies, and technology assessment.*”¹³⁵

¹³⁵ <http://stss.flu.cas.cz/en> (accessed 30th of March 2017)

From the STSS center, we interviewed K. Mracek and P. Machleidt, which were amongst Tondl's PhD graduates and specifically worked on TA in his institute. Machleidt and Mracek explained that in the past, the landscape of TA-like activities was mainly divided in two tendencies. The first is described as research based and the second as being prognostics and planning more in line with the administration of the socialist regime. While the institute of prognostics carried out the latter, the people at the philosophical institute worked on the research base by addressing the theoretical and methodological dimension of TA. Concretely, they did case studies on issues such as biotechnology or microelectronics. The main target audience consisted of other researchers but they say their studies were "*also suited for politics – not so much for the general public*". They add that those studies had to be carefully written in order not to be obviously system-critic as science and technology played an important role in the regime's doctrine. Machleidt and Mracek also reported naming and translating problems. At times, the term TA was avoided (in several presentations and written sources, reference was often made to the pejorative term of Technology arrestment. cf. Machleidt 2011; 2013). This did not help with the creation of a specialized and differentiated TA tradition. Instead TA was kept close in the STS tradition during this period.

After the socialist period, a series of conferences and collaborations around TA started with western countries. Following the first academic contacts, a collaboration project entitled "*Technology Assessment or the Ethics of Science in East Central European Nationals - An appraisal*" or in short "*TA East*" was launched by G. Banse at Europäische Akademie zur Erforschung von Folgen wissenschaftlich-technischer Entwicklungen; Bad Neuenahr-Ahrweiler GmbH (EA¹³⁶). This collaboration was a first major opening of the Western European TA community to colleagues from behind the former iron curtain.

In 1999, a workshop was jointly organized in Prague by the EA and the STSS. "*The meeting provided a fair overview of the status and perspectives of TA in individual countries of Central and East Europe. However, it also showed the complexity of creation of space for TA type activities*" (Banse et al. 2000b: 5). As Czech coordinator of TA East, Machleidt recalls «*the collaboration with the Germans has been very important. They helped us a lot*». The contacts established during this project launch further collaborations - notably the participation of the STSS as Czech Partner in the European "*strategic analysis of specific policy issues*" (STRATA) project as well as "*Technology Assessment: Methods and Impact*" (TAMI, 2002-2003). In addition, from 2004 to 2007, STSS also took part in the FP6 – Science and Society project "*The Institutionalization of Ethics in Science Policy; practices and impact*" (INES). Several European TA institutions took part in this project.

¹³⁶ <http://www.ea-aw.org/> (accessed 29th of January 2015)

Despite the fact most of the TA researchers are retired or have moved to other professional horizons, the institute is still active and employs 9 people. More recent projects having affinities with TA encompasses MASIS (Filacek 2013a, Meiljgaard et al. 2012), Nanopinion¹³⁷ or RESAgora (Filacek 2013b). The STSS and hence the early Czech TA tradition are considerably characterized by a strong philosophy tradition. The strengths of STSS of elaborate theoretical reflections and academic research based on Technology and Society relations are domestically acknowledged (Pechan 1996, Pokorny et al. 2013). Furthermore, STSS members contributed to the “*development and teaching of postgraduate TA courses*” (Pechan 1996). Machleidt and Mracek affirm that STSS has never had formal contacts with the European Parliamentary Technology Assessment Network (EPTA).

4.2 Prague Institute of Advanced Studies

Another institute that has been active in the field of Technology Assessment in the Czech Republic was the Prague Institute of Advance studies (PIAS). Parallel to TA East and TAMI¹³⁸ projects, while the STSS team of the institute of philosophy at the Academy of Sciences occupied the more theoretical and scientific ground regarding TA, a new actor, PIAS entered the scene of TA. It notably contributed to make TA (1) more policy-oriented (more particularly even parliamentary-oriented) and (2) increasingly concerned with innovation and industrial development.

In addition to its TA enterprise, PIAS was initially active in other fields such as technology transfer, networking, and innovation support for SME as well as at the origin of a Science Park project. It was created in 1991 by the Czechoslovak Academy of Sciences and Ministry of Education, Youth and Sports (MEYS) of the Czech Republic (Škoda 1991: 203). In order to prevent scientific brain drain, its mission was to foster international and national scientific excellence in the fields of “*biology, bio-medicine, agriculture, ecology and related disciplines that directly affect quality of life*” (Škoda 1991:203). At the founding moment, the financial plan foresees “*shares in the operation of the Scientific Park, fees from licenses to foreign and domestic companies, participation of national and state agencies and organizations, and utilization of means made available through international sponsors and grant agencies*” (Škoda 1991). Here again, TA did not emerge as organizationally specialized and differentiated from other activities. It also remained under the auspices of the Academy of Science and its coping strategies during the political transition. Only this time, the focus was placed on innovation rather than on theoretical considerations.

¹³⁷ <http://www.nanopinion.eu/> (accessed 29th of january 2015)

¹³⁸ <https://www.ta-swiss.ch/en/methodology/tami/> (accessed 29th of january 2015)

PIAS' president P. Pechan had already positioned his organization on the Czech TA scene with a publication in the ITAS-run TATuP journal in 1996 and briefly later in the "TA East" inventory of TA actors in the CR. It perceived its role as being more oriented towards policy-advice and the general public as opposed to the more academic exercises undertaken by STSS. It was PIAS who took up the entrepreneurial part of promoting TA in policy-making spheres and linking the Academy of Sciences with Policy-Making. Already in 1998, Pechan reported on the progress and "*difficulties of the practical and institutional anchoring of Technology Assessment in the Czech Republic*" (Banse, 2000a: 13). At some point, PIAS' ambition was clearly to act as a central TA actor in the Czech Republic, with the goal to "*meaningfully advise the Parliament of the Czech Republic on scientific and technological option assessment issues, to organize consensus conferences and to fully participate in the process of informing and educating the public about science and technology progress*" (Pechan, 1996). In 1996 PIAS became official advisor on science and technology policy to the Czech Parliament and joined the EPTA network as observer, reporting on the progress of Technology Assessment in the Czech Republic.

As Machleidt put it "*it was supposed to bridge the gap between the Academy and the political spheres*". This experiment did not last that long. Besides some presentations and a few articles (Pechan 1996, Van Berg & Petermann 2000: 7) there is not much traces remaining today of this period. In a report about TA in the Czech Republic, G. Banse (2000b) briefly mentions the risk of closure of PIAS without any more details. Other interviewed actors report that its mission of institutionalization TA has ended in a certain discomfort with both of the main involved actors, namely the Academy of Sciences and the Government. The representation of the Czech Republic in the EPTA network was also interrupted for some time. Retrospectively, informants of other EPTA members question the claims on behalf of PIAS concerning its actual links to Parliament and Czech Policy-making circles. Furthermore, several interviewees account for a credibility problem of TA in the CR after this unfruitful experience.

With Hindsight, Banse (2011: 188) considers the PIAS example as an imitation or a "*transfer of solutions*" that had "*no chance or realization*". The initial euphoria gave way to the disappointing experience concerning the "*limits of the 'transplantability' of knowledge generated and experience gained elsewhere – i.e. under different economic, technical, political, social, and cultural conditions*" (Banse 2000a: 16). Today, the Institute has been dissolved and there are no more records of PIAS or his director Pechan in TA relevant literature. Neither were we able to find the contact details of the former directors or employees.

4.3 Technology Centre ASCR

The Technology Centre is the most recent player in the Czech (and international) TA scene. It slowly and carefully tapped into the practice, tested the concept in different settings and started to selectively take up its rationale and promote it in policy-making circles. With the TC, the TA activities are becoming much more practice- and policy-oriented.

The Technology Centre was founded in 1994 as a “*non-profit special-interest association of legal entities*” (also often presented as a Non-Governmental Organization [NGO]) to promote the societal uptake of results of the Czech Academy of Science. Its members are five Institutes of the Academy of Sciences (Physics, Microbiology, Chemical Process Fundamentals, Plasma Physics, Molecular Genetics) and Technology Management Ltd. Its original mission is often presented as an initial technology transfer office. Over the years the center has gradually broadened its missions and activities. Today the center is structured in three main departments: the department of Business Development, the National Information Centre for European Research and the Department of Strategic Studies (STRAST). It also has a liaison office in Brussels to facilitate Czech participation in European research, development and innovation consortia. A public relations flyer describes its official mission as follows: “*the Technology Centre ASCR supports the participation of the Czech Republic in the European Research Area, prepares analytical and conceptual studies for research and development, performs international technology transfers and supports the creation and development of innovation businesses*”.

The STRAST department is of the most interest for the recent and new uptake of TA activities in the Czech Republic. When it was created in 2004 it did not yet do TA. Its activities first evolved around four cornerstones: system analysis, scientometrics, foresight, and evaluation. The department arose from a specialization in “*analytical and conceptual works*” (Pokorný et al. 2013: 103) and now acts as a “*research center and a think tank in the area of management and policy for research, development and innovation. [Its] mission is to contribute to the improvement of strategic decision-making in research, development and innovation at the national, regional as well as European level*”¹³⁹. This comprises identifying research priorities in line with socio-economic needs of the Czech Republic, contributing to STI strategies and evaluating R&D programs. In this framework of elaborating background papers for advisory bodies and the public administration, the STRAST unit had started to look into foresight and evaluation activities in the field of STI policies and engaged in a series of international collaboration in that matter. The head of the STRAST department considers those foresight activities as a “*first step towards TA*”. The TC also became a member of the

¹³⁹ <http://www.strast.cz/en> (accessed 29th of January 2016).

European Techno-Economic Policy Support Network (ETEPS)¹⁴⁰. In this context, it also took over and re-launched foresight courses from the United Nations Industrial Development Organization (UNIDO) (cf. Machleidt 2011). These international collaborations continued with participations in the ETAG (European Technology Assessment Group) consortium¹⁴¹ with TA projects on wildcards and weak signals, future food and feeding 10 billion people. Later, and probably due to these experiences and the contacts made through those collaborations, the TC joined the PACITA consortium. In the course of the PACITA project, the department has added Technology Assessment as a fifth area of specialization. Accordingly, the institutional website¹⁴² was updated to stress that “*in collaboration with leading European institutions, the TC develops the concept of technology assessment and prepares expert studies that assess various aspects of new technologies for decision-making bodies on the European level (esp. the European Commission and the European Parliament).*” Indeed, the practice first developed with a European and collaborative focus. Follow-up projects include for instance the H2020 projects such as CIMULACT (Citizen and Multi-Actor Consultation on Horizon 2020) led by the Danish Board of Technology Foundation. Another sign of the centrality of the TC in the national TA and the policy-relevance of their work is the fact that after PIAS’s retreat, the TC also reconnected with the EPTA network. In the last years, TC representatives (directors or delegates) got invited to EPTA meetings– first the director K. Klusacek and later Z. Kučera and more recently L. Hebakova, who is in charge of coordinating more specific TA activities inside the TC, took up this ambassadorship

But STRAST also made efforts to establish TA on the national level. Here, traditional addressees include the Ministry of Education, Youth and Sports (MEYS), the Ministry of Industry and Trade (MIT), the Research and Development Council (CRDI) as well as regional governments.

Around 2000, the Ministry of Education addressed STRAST for the first time in the context of identifying priorities and doing technological forecasting in the national

¹⁴⁰ETEPS Network (European Techno Economic Policy Support Network) was initiated by the ITPS. It is “a network of European organisations that operates in all 27 EU Member States, covering policy subjects such as agriculture, consumer protection, energy, environment, enterprise, health, information society, innovation, research, and transport.” (http://en.wikipedia.org/wiki/Institute_for_Pro prospective_Technological_Studies last accessed 25th of April 2017). Members are also national TA organizations such as ITAS -KIT (Germany) and ITA OeAW (Austria)

¹⁴¹ The group responds to internal calls for the Scientific and Technologic Option Assessment (STOA) at the European Parliament. Those activities have started with minor participation in outsourced activities for the European Technology Assessment Group (ETAG) up to a more involved membership in this same consortium. A notable study was the “*technological option for feeding 10 billion people. Plant Breeding and Innovative Agriculture*” (Meyer et al. 2013).

¹⁴² <http://www.strast.cz/en/about-us/technology-assessment> (accessed 29th of January 2016).

research program. This task has been repeated 3 times since. In the meantime, the department continued with other analytical work and grew further. The foresight activities comprised on the national level R&D priorities (respectively in 2003-2004, 2005, 2007 and 2011). On the national level, the Unit was also granted a project by MEYS. It aims at developing methodologies for “*systematic monitoring and assessment of technological and socio-economic trends, methods for assessing potential impacts of new technologies on society, and methods for evaluating the results and impact of science policies*” (entitled VATES¹⁴³).

More recently, the TC has collaborated with the public administration in the preparation of the next “Operational Programme Research, Development and Education” (2016-2020). This public policy aims at implementing the European Social Fund and the European Regional Development Fund and tackled specifically the research and education sectors. The TC managed to explicitly include the notion of TA in the document. This may result in upcoming calls focusing more explicitly on Technology Assessment.

STRAST currently employs a staff of 14 people and also publishes the Scientific Paper: Ergo – a peer reviewed journal of analyses and trends in research, technologies and innovations. Among all the TC departments, STRAST has the highest share of temporal project funding as opposed to more structural and long-term financial support the other units have. It is mainly through project funding that TA and TA-like activities continue to be sustained at the Technology Centre - either by participation in international consortia or by proactively submitting domestic proposals.

5. Characterizing the institutionalization of TA in the CR

This section will explore the nature of institutionalization of TA in the CR and look into the most recent efforts to promote TA in the CR by the TC both by taking up the role of a TA knowledge producer and establishing itself as a central reference point for the practice.

Consistent with the other case studies, the multifaceted and non-linear process of institutionalization will be explored through organizational and cognitive dimensions. The organizational dimensions imply to look at the embeddedness of the practice in policy-making and more specifically the type of actors and organizations involved and to examine their mutual relationships. This is facilitated by the inclusive modeling approach (Ganzevles et al. 2014) looking into the involvement of TA with the four spheres of government, parliament, science and technology, and society on the macro

¹⁴³ <http://www.strast.cz/en/projects/projects-list/vates> (accessed 30th of March 2017)

(financing, evaluation, addressees), meso (organization, staff, human resources, qualifications) and micro levels (projects, outputs, reviewing, etc.) of TA practice. Additionally, it is also important to look at the use of results and the possible effects they can have on policy-making.

On the cognitive level, we will look into the discourses about TA. How is the need for TA expressed and what forms of TA are advocated? What institutionalization strategies and uptake of activities are pursued? How is the evolution between different approaches portrayed? How has the relationship to existing Western institutes and taxonomies evolved? Finally, we will look for the presence of constitutive elements of a community of practice and possibly sketch its contours and characteristics, notably in their relationship to other existing practices in presence.

5.1. Organizational aspects

5.1.1. Science

As we have reviewed above, there have been three main succeeding actors involved in Czech Technology Assessment. All of them were linked to the Academy of Science. STSS within an institute and PIAS and TC as initial technology transfer organizations. Hence, the involvement of the science sphere has a long tradition in TA in the Czech Republic. While PIAS is definitely out of the picture, the STSS and the Technology Centre remain active in the field. The TC is a more recent player, which becomes increasingly active in the field. However, the STSS, doing mainly academic TA with decreasing interest, does not particularly engage with other societal spheres. The Technology Centre notably has contributed to shift the approach by making it more policy-relevant.

More particularly, the TC unfolds a twofold strategy of belonging – or boundary work. On the one hand it stresses its affiliation with the Academy of Science of the Czech Republic (ASCR), which is put forwards in its abbreviation and logo (TC ASCR). In this context and given the dual science and higher education system, the ASCR institution is in potential competition with other actors such as universities for instance. At least it cannot pretend to represent the whole research landscape. Nonetheless, it increasingly positioned itself as a central actor for TA in the Czech Republic with an overview of the whole landscape of actors and practices. On the other hand, the TC also emphasizes its independence from the Academy. *“We have been established by the Academy but are an independent NGO”* stressed a project manager during an interview. At times it also puts itself forward as a think tank. In such understanding, the TC perceives itself and is perceived much more as an actor of the societal sphere.

Furthermore, on the institutional level, the qualification of “institutional traditionalists” (Hennen & Nierling 2014) and more particularly the fact that the TC has been created by the Academies of Science and is still affiliated to them also places it in the tradition of other TA institutes that have emerged from national Science Academies. Although the nature and role of the different national science academies is not comparable throughout Europe, they have played significant roles in the development of TA in several European countries¹⁴⁴.

On the meso level, this hybrid character between science and society is also maintained in the self-perception of the staff. While some STRAST members see themselves as scientists or researchers, others perceive themselves as project managers doing all kinds of other, non-research related work (communication, outreach, editing, facilitation, lobbying, etc.). Regarding project management, the TC staffers feel no different from other PTA organization they have come to know, and also outsource part of their activities: *“Regarding the management of a TA process, we are not different from DBT, NBT, IST, who also outsource and work with different clients. Except that they are not using the word ‘TA’ in the Czech Republic.”* (project manager at STRAST).

On the practice level, the Science side is strongly represented by the frequent reference to evidence when the STRAST members mention their policy-advice function. As a consequence, TA gets frequently portrayed as (or even used as synonym for) evidenced-based support for policy-making¹⁴⁵. Such an approach is often described as an amelioration of the current situation, which is judged to be insufficiently informed by science and expert advice (cf. Filacek 2013b). TA is conceived in a manner where it would “speak truth to power” (Hoppe 1999). In practice, it is also mainly scientific methods that are used and mainly scientific experts that are consulted. The format the TA “product” (Van Eijndhoven 1997) takes is also mainly driven by scientific writing and presentation standards. Furthermore, there are high expectations towards the input and use of data and TA reports produced elsewhere (cf. The “knowledge sharer” role put forward in Hebakova et al. 2016, see below).

Nonetheless, the science involvement is also quite diverse. It does not only involve the TC but gets input (on project level) from other knowledge producers as well. There is a certain division of labor both in the type of activity, the kind of knowledge produced and the balance between “realistic” and “relational expertise” (Ganzevles et al. 2012). *“The*

¹⁴⁴ This was for instance the case in Switzerland “TA-SWISS, which is [...] classified as independent organizational unit within the Academies” (Feresin et al. 2012: 165), Austria where “*ITA is a research institute of the Austrian Academy of Science*” (Nentwich et al. 2012: 30), the Netherlands, where “*the [Rathenau] institute is institutionally embedded in the Royal Academy of Sciences*” (Ganzevles et al. 2012: 125).

¹⁴⁵ It is to note that this contrast with the “official” PACITA narrative, which associates TA with “knowledge-based policy-making” (see PACITA chapter).

'realistic' approach explains the authoritative position of the expert on the basis of his specialized knowledge; according to the 'relational' approach [...] the informational and relational aspects continuously go hand in glove. Namely, exchange of information does not just happen; it needs to get organized. Accordingly, TA is framed in this study as a science-based practice of information production on science, technology and society matters. Moreover, TA is also regarded as a social activity where practitioners try to have an impact on their clients, by building up relations of knowledge sharing and trust with actors from various societal spheres." (Ganzevles et al. 2012: 23).

For instance the demographically representative recruitment of the European Wide Views¹⁴⁶ pilot project during the PACITA project has been outsourced to the sociological institute of the ASCR. The TC itself prefers to focus on tasks such as desk research, facilitation of debates, writing of reports, communication and outreach. Thematically their focus tends to be on STI governance. For risk issues, environmental and ethical consideration they admit to have less expertise and would require collaborations with other Czech experts outside of the TC (the STSS get mentioned in that regard but until today, no concrete collaboration has been undertaken). Whether these relations will build up to longer lasting community of practice or are simply to be understood as episodic contracting remains a question. The focus on project management may suggest the latter option. Some tasks are also delegated to the other departments. For instance, the National Information Centre for European Research hosted within the TC that also acts as National Contact Point (NCP) for European Framework Programs has assisted the TC PACITA team in establishing databases of Czech experts (in various domains including EHS and ELSI issues) for the example projects on public health genomics, ageing society and telecare and sustainable consumption. Personal and institutional contacts are facilitated with the help of the other departments (such as NCP (established thematic platforms) or the Enterprise Europe Network.

However, in the TC understanding experts are not just scientists as it can be found in early warning or classical TA (Biker 2014), experts are also civil servants and high-level stakeholders such as industry representatives or delegates of education or research institutions. In addition to constant reference to expert input, the TC staff also holds an ambivalent narrative of "evidence-based policy-making" i.e. the provision of neutral and unbiased scientific data for politicians to base their decisions on. While on one hand the TA promoters insist on this provision of neutral and unbiased knowledge, on the other hand they admit that a part of what they are already doing and specifically foresight does not totally fit this mission description. According to a senior researcher in the department of strategic studies, *"policy-makers prefer evidence. It's hard to get them interested in prospective studies."* This interview excerpt underlines the epistemological

¹⁴⁶ <http://citizenconsultation.pacitaproject.eu/> (accessed 30th of March 2017)

idea that future oriented activities do not necessarily provide “hard evidence” but for instance guidance for plural decision-making arenas by providing possible and plural futures.

5.1.2. Government

The government side is considered as the main source of legislative proposals on the STI policy. In line with their previous activities of policy analysis, evaluation and foresight in the area of STI, the TC envisions to continue in this privileged relationship with administrative and executive bodies on TA matters as well. Quite pragmatically as a project manager puts it: *“We have to do it our own way, what we usually do and what we are good at: write reports, papers, strategies, sometimes lobby a bit. But usually we don’t get involved with the Parliament”*. This quote sums up the Czech situation and prospects. The uptake of TA is path dependent and in continuity with already existing approaches and activities. TC sees itself in a role of *“intermediator among different government bodies”* and other innovation stakeholders (Hebáková et al. 2016: 58). This strategy has been qualified as *“institutional traditionalists”* by Hennen and Nierling (2014). In such a scenario, *“the best chances, if any, to build up a TA institution are for TA being integrated into already existing institutions which act at the governmental level with responsibilities in monitoring and evaluation of S&T”* (Hennen & Nierling 2013: 47).

For national projects, the TC and STRAST work with different Ministries and Regional administrations as main clients. The government and the administration are the privileged clients in an instrumental view of impact making and efficiency. When reviewing potential addressees, Pokorný et al. (2013) consider the CRDI as potential addressee as *“a close cooperation of the TA units with the CRDI would ensure a relative quick transfer of results of expert TA studies to the decision-making sector”* (Pokorný et al. 2013: 109). Other statements when reviewing possible addressee include: *“the best positive impact and the greatest effect in the CR”* would be encountered if the *“TA institution was answerable directly to the government, which is according to our opinion, capable of defining problems with relative ease”* (Pokorný et al. 2013: 109).

The MEYS is also the first body to formally finance a policy-oriented Technology Assessment approach. The so-called VATES project financed by MEYS runs from 2015 to 2020 and comprises next to a foresight and an evaluation work package also is concerned with *“assessing impacts of new technologies”*. The same goes with the latest Operational Program for Research and Education, which channels European Funds and has incorporated elements from TA approach, which may result in TA oriented project calls.

5.1.3. Parliament

As it appears from the interviews with the TC, the interest from Members of the two legislative assemblies of the Czech Republic is quite limited for TA. In this context, the staff from TC confessed to frequently running into problems when it comes to engaging parliamentarians in activities relating to TA¹⁴⁷. As a project manager confesses: *“We’ve had huge debates here. We were struggling with the PACITA focus on parliament. Not because it’s irrelevant but there is no effective collaboration. It’s difficult to approach. Thanks to PACITA we build some contacts and collaboration activities with MPs or senators. But the approach of MPs listening to TC is not satisfactory. It will probably be the same for other activities (policy analysis, strategic studies). They say they are interested but nothing happens. It’s a long-term challenge with short-term politicians. It’s easier to work with the Ministries”*.

In addition to the disregard of Parliament and in contrast to other institutionalization processes (see for instance or the Portuguese and Walloon cases in this thesis) the parliamentary opposition is at no point mentioned¹⁴⁸. Not only does such an approach stand in contrast to the OTA rationale of empowering the legislative branch in terms of analytical capacities. The opposition and its roles in Government control and criticism are absent from all discourses about TA. Parliament is always represented as relatively weak and powerless or MPs supposed to be uninterested in S&T matters. Dimensions of legitimacy and publicity of deliberations and socio-technical choices (as it would for instance be the case in a Parliamentary setting) are very seldom addressed upfront.

Within the PACITA project, the repeated difficulties and encountered peculiarities of advocating Parliamentary Technology Assessment in the Czech Republic and other Central and Eastern-European Countries led to a change of vocabulary within the consortium. The final book issued by the project partners indeed mentions “policy-oriented Technology Assessment” as the overarching theme, instead of “parliamentary” TA as it was the case when the project started (Klüver et al. 2016). While the TC still tries to reach out to Parliament, it does not seem that this (quasi non-existent) relationship has an influence on the way TA develops in the country.

¹⁴⁷ See also our own difficulties to obtain interviews with Parliamentarians above.

¹⁴⁸ In other institutionalization pathways such as in Germany or the US (see Vig & Paschen 2000), the dynamic between the majority and the opposition played an important role in the installment of TA capacities.

5.1.4. Society

The openness to some strands of civil society is mainly manifested through the tentative inclusion of certain stakeholders with participatory methods. More generally, the TC has also started to experiment with participatory foresight and evaluation activities. These activities are in line with the very fragmented distributed governance structures of the Czech STI system and its increased privatization. Hence, discussion platforms and network governance are perceived as increasingly needed for cooperation and coordination.

There are also reflections about opening up the financing possibilities of TA of the private sector beyond the sole government and science side. A TA *“institution should not be based on a project basis. It might be a good idea to find some way of co-financing the TA institution, in which the state administration, research institutions and the enterprise sectors would all participate.”* (Pokorný et al.2013: 108)

The overall discourse of involving society gets taken up in a particular understanding of society. Quite often it is science stakeholders (mainly enterprises and business organization), which are mentioned or involved in pilot projects or debates. Contrarily to previous institutionalization processes, there has been little if no talk about environmental or other post-materialist civil society groups (Vig & Paschen 2000). (Lay) Citizen participation is judged as difficult in the Czech context and not of much interest to the TC. In general, the relationship of TA to the societal sphere remains rather limited. The TC is involved in some (European) projects that experiment with public participation and aim to build up capacities in the partaking countries and partner organizations. It however remains a tentative approach sponsored by the EU level. The results of those are still to be evaluated and additional work needs to be carried out to gage the existing interest adapt those methodologies to context of the Czech Republic. As a project manager puts it: *“We try to increase people’s involvement in STI issues. But it will most probably not be like the Danes’ people involvement. We will probably act as an intermediate between the Academy and Politicians – which we are already doing on other issues.”* Interpreting this excerpt echoes with the previously mentioned twofold belonging of the TC to both the science and the societal sphere.

Contrary to other countries where civic and techno-critic mobilizations have played significant roles in the advent of Technology Assessment practices (Hennen & Nierling 2014, Vig & Paschen 2000), the situation is portrayed differently in the Czech Republic. Machleidt (2011) based on insights from the Eurobarometer qualified the Czech Society as overly techno-optimistic and holding science in high regards. There were almost no mentions of high-level socio-technical controversies in our interviews. *Banse however warns of so-called “illusionary notions [...] in the field of Technology Assessment, whether*

in the form of trust in 'science' or 'the' experts in general, in demand for 'neutral' or 'independent' expert opinions, on in the belief in the state's 'omnipotent' and 'paternalism' (on the other hand, just the opposite can also be observed, namely, the opinion, that TA won't really be institutionalized before enough "pressure from below" has been generated on the basis of a high degree of environmental consciousness)". (Banse 2000a: 16-17). Nonetheless, all this indicates a rather weak involvement of citizens in TA. To overcome some country specific hindrances concerning public participations, the TC considers potential for "virtual public discussion" facilitated by "information technologies and digital networks" (Pokorný et al. 2013: 99) as a way forward to increased citizen participation in Science and Technology issues.

5.1.5. Inclusive modeling of TA in the Czech Republic

Given these brief descriptions, the "inclusive" model of TA in the Czech Republic comes close to the "Shared science—government involvement in TA" (Ganzevles et al. 2014)¹⁴⁹ as depicted in Figure 12. There are minor occasions for a limited opening to society, with the inclusion of particular stakeholders in some participatory processes. Parliament is totally absent from the picture.

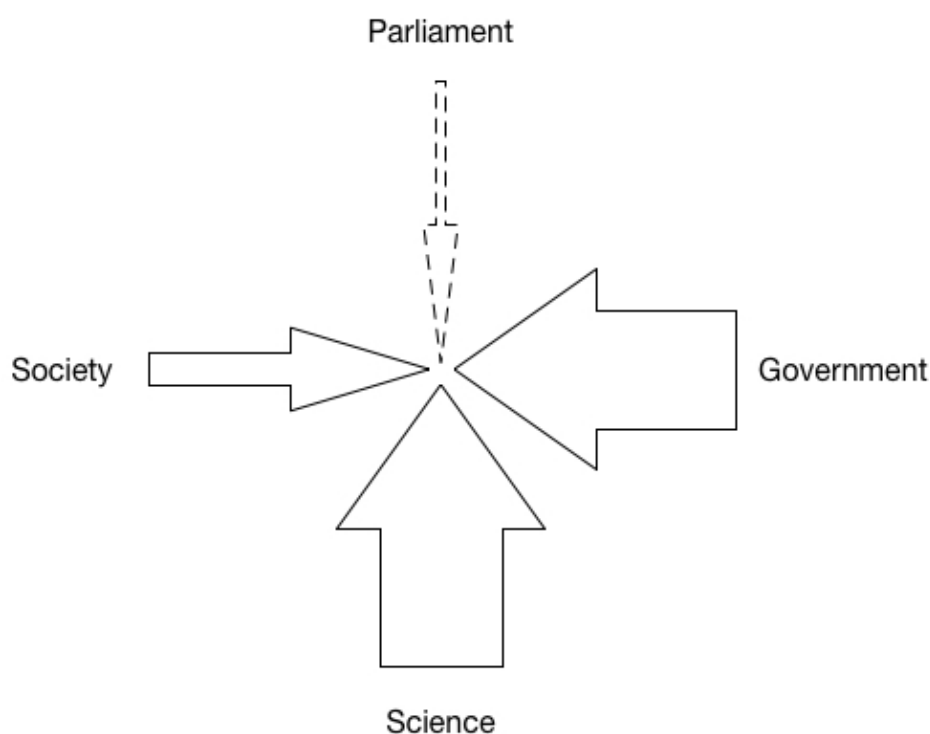


Figure 12: Inclusive modeling of TA in the Czech Republic: Shared Science-Government-(Society) involvement

¹⁴⁹ This model resembles more or less the model of the Institute of Technology Assessment (ITA - ÖAW) in Austria until recently. However, ITA became more participatory and strengthened its relation to parliament in the last years. see Ganzevles et al. 2014).

On several occasions (during our interviews but also in Pokorny et al. 2013) the TC managers expressed the necessity for continuous funding of TA activities. Up to now these have only benefitted from project funding, among which a considerable amount emanated from EU projects. Furthermore, the STRAST department is the one with the highest share of temporary project funding in the Technology Centre but it relies on a broader and diversified (project) funding base. The relationship to policy-making is very proactive and not yet stabilized. There is no tradition or reflex to resort to TA in particular situations, nor are there records of explicit demands being expressed towards TA or specialized TA studies being commissioned. Nonetheless, the TC managed to “lobby” and persuade the government to include TA aspects and combined them with other approaches in recent funding programs and research projects.

5.2. Use of results in policy-making and other impacts

There are nearly no records of any impacts of TA activities in the Czech Republic so far. However, the TC considers that the Ministry for Education, Youth and Sports has been sensitized to TA and now accepts some elements of it in the projects submitted by the TC. While earlier generations certainly contributed to produce relevant TA knowledge and to make scientific contributions, their engagement with societal and political spheres were very limited. Similarly, to the difference between realistic and relational expertise that we used in the previous chapter, we propose to distinguish between “issue-centered” and “relational” or “engagement” approaches of TA activities. Both processes are currently being played out in TC’s strategy to strengthen TA in the Czech Republic.

Firstly, issue-centered TA activities, such as pilot projects, typically address certain societal issues in relation to technological development (ageing, or sustainability for instance). In line with the traditional working mode of TC, we have seen above that for such kinds of activities are preferably considered envisioned as a “product” (Van Eijndhoven 1997): issuing papers, reports, expert opinions etc. This trend also continues for the valorizing of TA projects. Indeed, under the “expanding the TA landscape” objective (see the PACITA chapter 2), the open-ended PACITA activities were left open to the appreciation of every national partner. Thus the choices made became a symbol of how this “expanding of the TA landscape” was locally understood and performed. It thus gives insights into strategies for developing TA by the concerned organizations. For the Technology Centre these efforts mainly concentrated around valorization of the results of the PACITA pilot projects (ageing society & telecare; Europe-Wide Views on sustainable consumption). Additional research briefs were written and translated into Czech, supplementary meetings and workshops were organized with civil servants to

present the results of those pilot projects. This stays in relative contrast with more discussion and debate-oriented based activities about organizational forms and institutionalization issues for TA as we have seen for instance in the Portuguese and Walloon case studies. Indeed, it seems that the pilot projects were the ones that were utmost valorized by TC. The STRAST team thus tried to use them as practical demonstration and evidence of the concept of TA and its potential for policy-making. In such a view, TA progresses if its products are taken up. Indeed, in this issue-centered style concerned with efficiency and rapid transposition of results into actions, the ambitious expectation of TA impacts falls under the “initializing actions” in the domain of “policy aspects” (implementation of innovations, new legislations) following the category proposed by Decker & Ladikas (2004). Furthermore, as barriers to the development of TA, the Czech PACITA team foresees a *“shortage of suitable pilot projects that could serve as good examples in the future”* (Pokorný et al. 2013: 107).

Secondly, there has also been a series of more dialogical or relational activities – notably in the framework of the PACITA project. Those comprised activities as varied as workshops, debates, participatory activities, training and raising awareness activities. The expected outcomes here are less instrumental and arguably broader than the written reports and evidence produced. For instance, they convey learning through engagement, or foster reflexivity via exchanges between participants. They furthermore organize the channeling of these issue-centered assessments in order for them to be taken into account. As a project manager puts it, the first dimension is well taken care of whereas the second still needs some improvement. *“The problem with STRAST is heavy work on report and analysis but there is no PR [Public Relations] to politicians to listen to the results and outcomes. The outcomes are not visible enough.”*

Van Oudheusden et al. (2015) have shown that TA can mediate between different generations of innovation theory. This occurred notably by drawing attention to neglected points of views and stakeholders’ roles or the use of participatory methods. We find evidence of a relative broadening of the conception of innovation in the way TA is enacted in the Czech context. Practitioners relate that TA exercises helped them to get a more comprehensive and holistic view on problems. The following quote well captures this: *“The contribution of the TA tradition is its stressing the societal dimensions of foresight, the value of participation and the idea of including parliament more directly”* (Hebáková et al. 2016: 59). TC staff taking part in activities such as the PACITA summer schools or the practitioner’s training testified to have gained a broader, more comprehensive view on the innovation issues they are dealing with. Additionally, they report methodological lessons that inspired them to innovate in their work and original practices, notably in certain participatory, deliberative methods or in terms of communication and new ways of addressing policy-makers.

The “hard” impact dimensions are certainly more prominent when confronted with an ideal future situation where TA would be institutionalized (as we find it in the Pokorny et al. [2013] report scrutinizing different institutionalization scenarios). It also continues to be true with regard to the incremental approach the TC endorses by selectively taking up TA practices and progressively integrating and combining them with other already existing practices. This continues to be in line with the traditional product approach of the TC, mainly delivering reports. However, the current situation also concentrates efforts on these so-called dialogical and relational activities such as raising awareness, training, debating the functions and institutionalization options for TA in the CR. Raising awareness is indeed presented as a necessary condition for further developing the practice and particularly linking it to policy-making. Retrospectively looking at the lessons learned from the PACITA project, a group of authors from the participating countries in eastern and central Europe have proposed an original approach to endorsing TA in their respective countries. For the Czech Republic, the proposed new roles for TA are namely the “eyes opener”, which ranks first before the mission of “knowledge sharer” in second order of importance (Hebakova et al. 2016: 79). *“Eyes opener shall give politicians a glimpse what is going on at the EU level or in other European countries and raise awareness on important issues. TA can be understood as a broad set of practices aimed at informing, shaping and prioritizing technology policies and innovation strategies, by deliberately appraising in advance their wider social, environmental and economic implications.”* (Hebakova et al. 2016: 79). The focus here lies on information sharing and raising awareness between polity levels and by doing so fostering a broad and comprehensive understanding of STI policies. A TA capacity in the Czech Republic should in fact operate this mediation between foreign and domestic approaches. Whereas *“the 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 [...] some other countries can afford large-scale research on the impact of technologies developed in their countries on society in general [...] then adapting already existing EU knowledge into the local context might be a more feasible solution”* (Hebakova et al. 2016: 79).

To sum up, it is safe to say that currently the institutionalization is mainly located at the micro level of projects and evolutions in the practice. Lots of uncertainties remain on the institutional and organizational level, where the majority of data emanates from discourses and concrete practices (as opposed to legislative texts or decree proposals in the respective Portuguese and Walloon cases). It is uncertain whether the singular activities will amount to greater synergies and, as Nielsen (2014) puts it, result in legitimate expectations towards repeated TA activities on the institutional level. On the organizational level, the TC and more particularly the STRAST currently work on synergies between different recent TA projects and between TA practices and their other traditional spheres of activities.

Table 3 below summarizes the involvement of the different spheres on the institutional, organization and project levels and delivers additional precisions.

Institutional level	Mission	Initial TC mission of Technology Transfer Office (innovation oriented) Enlarge missions of STRAST (TC) and become a central network node for TA activities in the Czech Republic. Improve STI governance (Ministries and stakeholders targeted)
	Client	National ministries (MEYS, MIT) and Administration (CRDI) National innovation stakeholders European Parliament (STOA) via participation in ETAG projects Efforts towards Parliament without much success
	Funding	No baseline funding (STRAST department has the highest rate of temporal project financing) Proactive project-based proposals: combination of EU funds (FP7, H2020, structural funds) and different national resources (MEYS, MIT, regional authorities). Exploring possibilities of co-financing by enterprise sectors (Pokorný et al. 2013)
	Evaluation	No TA specific and general evaluation procedure. Case by case basis
Organizational level	Staff	In-house: mainly STRAST (desk research, document analyses and project coordination) No TA specialization in the staff (however recent creation of a TA sub-unit within STRAST)
	Board	[No data available – Founded by 5 institutes of the ASCR]
	Working procedures	Project dependent Always a coordinator / project manager for each project Split between in-house and outsourced work depending on available competences.
Practice level	Projects	International, national and regional governmental or administrative commands and/or calls Pro-active project submissions by TC
	Staff	TC: coordination tasks Collaborating with other TC departments Outsourcing of other tasks (recruitment, EHS, ELSI issues) to specialized scientists (mainly academy of Sciences) Also international work split in ETAG (TC provides local data and specializes in desk research)
	Participants	Science mainly (expert input/evidence provision) Innovation stakeholders (slight opening to society) (Possibly citizens – in progress and local adaptation)
	Advisors	(External advisors from Administrations and Ministry) (Internal Advice from senior management and hierarchy) See also Platform idea for more debate activities
	Review procedures	Mainly internal Peer review of publications Project meetings with experts and public administration

Table 4: Inclusive modeling at the macro, meso and micro level of TA activities in the Czech Republic

5.3. Cognitive aspects: discourses and community of practice

5.3.1. TA discourses

This section will explore the discourses about TA from promoters, practitioners as well as analysts and people engaged in the activity (as addressees, participants). Our analysis points out different discourses about the particular development of TA in the Czech Republic. Who should perform it, how should it develop and how has the practice evolved with the different actors performing in over time? It also addressed how it relates to existing European practices, organizations and taxonomies.

5.3.1.1. *Who should do TA - flexible interpretation of existing taxonomies*

In the middle of the PACITA process, the TC issued a working hypothesis about the possible institutionalization options for TA in the Czech Republic (Pokorny et al. 2013). The authors reviewed (without explicitly naming them) the commonly accepted taxonomy of “*Parliamentary Committee*”, “*Parliamentary Unit*” and “*Independent institute*” or “*Interactive model*” (see Hennen & Ladikas 2009; Enzing et al. 2012). The categories and their respective traits were however subject to considerable interpretative flexibility and selective readings. Upfront the committee model was evacuated with reference to the fragmentation of competences among different parliamentary committees (see above) and the little effective influence the parliament is perceived to have in the STI area. The Parliamentary Unit is presented as either running in house TA missions within the parliamentary administration (as it is the case for POST in the UK) or subcontracting TA studies to external scientific institutes (as TAB does it in Germany). The authors of the report express a preference for such a “*Parliamentary Unit*” model because of its supposed “*positive impact and the greatest effect in the C[zech]R[epublic]*” (Pokorny et al. 2013: 109). However, the focus lies more on “Unit” than on “Parliament”. Following an efficiency and impact argument, the authors express the necessity if such a “*TA institutions was answerable directly to the government*” (or alternatively the CRDI, which has considerable decision-making power over the whole STI system) and would “*ensure relatively quick transfer of results of expert TA studies to the decision-making sector*” (Pokorny et al. 2013: 109).

Within this model, the authors also show a preference for outsourcing compared to the in-house option and stressed in the case of CRDI as it “*is also used in cooperation with external entities, because it used relatively frequently, professional services in the field of analytical and strategic documents. This could facilitate future cooperation with the supplier of inputs for TA process in the C[zech]R[epublic].*” (Pokorny et al. 2013: 109). Although not outspoken in this scenario, the TC could typically be one of such “supplier of inputs” as it already does for other tasks.

Lastly, the independent or interactive model and its mission to both inform policy-making and stimulate societal debate is reviewed. In such an alternative scenario, there would be no need for a new institution to be erected but the TC for instance could take over such mission. For this task, the organization is presented as successfully working at the interface of research, policy-making and the general public and benefits from an independent and trustworthy perception¹⁵⁰ from the government, interest groups and citizens. With regard to the public participation mission generally associated with those independent models, the prospects are rather humble. The authors see possible barriers for citizens participating in TA processes and related legitimacy problems in the eyes of policy-makers. The exact way of how such public debate stimulation would occur remains open to discussion. Thus the meaning of the independent/interactive model also gets reinterpreted with a stronger focus on the organizational affiliation than the methodologies used as such. Over time, this scenario of the TC endorsing the role of an “independent” organization has become dominant and remains relatively uncontested.

5.3.1.2. TA as innovation enabler

Hennen and Nierling (2014) point out that in contrast to the earlier “waves” of Technology Assessment, innovation is a core feature in the analysis and argumentation of TA proponents today and especially in countries that do not have formalized TA capacities. The economization, which is, a shift towards mainly thinking in terms of economy, of science policy (Berman 2014) becomes the main leitmotiv to justify public investments in Technology Assessment. In the “economy first” rationale (Hennen & Nierling 2014) TA is above all invested with concepts such as productivity and competitiveness. Hence TA should help with prioritizations of STI policies for economic ends. Machleidt also acknowledges this current prevalence of innovation for economic growth saying that the need for innovation has become more pressing in today’s context. Although he recognizes the need to discuss value dimensions of new technologies, he stresses that the demand from Czech society for debate on socio-technical issues and by certain extent social acceptability of technologies is not very stringent. More importantly in his view is that TA tackles innovation issues and contributes to foster economic results, contrarily to its long reputation of “technology arrestment” or the perceived historical (over-)emphasis on the risks dimensions of new technologies (including its own approaches). Machleidt identifies TC as an “innovation enabler” in the Czech Republic. According to him, the need for TA nowadays is “*not only due to possible risks [...] but first of all to take into account [new technologies] development and innovation potentials*” (Machleidt 2011: 195). He further compares the activities of the TC with

¹⁵⁰ See Filacek (2013b) on the relatively high reputation of the Academy of Sciences in the Czech society.

constructive Technology Assessment (CTA), whose purpose is “*not to restrict but to support*” (Machleidt 2011: 195) technological developments. This view is notably illustrated with a recent project that the TC ASCR has prepared in cooperation with the CRDI and the Office of the Government concerned with priority setting for national R&D policy. Besides emphasizing the convergence possibilities of a TA approach with other practices, it also subordinates them to innovation support. “*These projects represent a practical demonstration of the close ties between foresight activities and TA in the area of assessing R&D, innovation and technology trends, which, in the end, leads to wide-ranging support for innovations*” (Pokorný et al. 2013: 101).

This is clearly corroborated in the interviews with several of the TC staffers, which emphasize the expertise TC has in terms of advising innovation policies. In contrast, they admit not to be specialized on the risk side of STI or ethical and sustainability dimensions. For those dimensions of risks, social and ethical implications they refer to already existing legal requirements implemented elsewhere (such as Environmental Impact Assessment or Ethical Assessment). Alternatively, they mention the necessity of collaboration with other actors (notably the STSS). Nonetheless, they admit that the capacities for such kind of expertise are quite limited in the Czech Republic.

5.3.1.3. From isolation to catching up and original uptakes

For a long time, the TA practice was caught in a tradition that evolved in relative isolation from Western EU Members (see Banse et al. 2000a). This period was followed by the dynamics of catching up and imitation that resulted in relative failures in terms of institutionalization (Banse 2011). In the 1990s and 2000s, TA in the CR has been described as oscillating between, on the one hand, recognizing the national peculiarities about the practices, methods, theoretical underpinning, the very label of Technology Assessment and its institutionalization forms and on the other hand a lagging behind attitude concerned with catching up with European (and mainly German) standards, theories and methodologies.

The straightforward transfer of institutional solutions is however seen with increased skepticism. Let's consider some of those arguments. Primarily, the shortage in public finances impedes and refrains from new organization creations and makes it difficult to find funds for TA. This became even more stringent since the economic crisis and its consequence on public budgets. As seen above Pokorný et al. (2013) have reviewed a series of other limitations in terms of Parliamentary interest and capacities. Civic culture is also perceived as discouraging public participation forms of Technology Assessment. Regarding the downturn of past TA experiences, Machleidt suggested that “*TA may come back under new names*”. He further refers to other possible evolutionary pathways the TA may have taken: “*Foresight and/or the French style research “la prospective”,*

frequently occurs in countries where TA concept (for all sorts of reasons) did not take its roots” (Machleidt 2011: 195). He thus hints that developments of TA in the Czech Republic may turn out quite differently from evolutions having occurred elsewhere in Europe.

At the end of the 1990s, the TA East project already recognized that TA in the Czech Republic could not just be measured and compared to the pathways it took in Germany or other Western European countries. The authors thus recognized *“that standards as well as the methods differ [...] new and innovative developments are beginning to appear in this field (for example, industrial organizations and local governments as clients, a more comprehensive view of problems, new conceptual approaches, completely different forms of institutionalization)”* (Banse 2000a: 17). These insights are put into perspective with parallel evolution of the TA practice at the time of inquiry. *“New elements are evolving in the ‘TA-landscape’. These are, e.g. interdisciplinary research institutions. New solutions can also be seen in curricula oriented on holistic principles, as well as in the establishment of private foundations as sponsoring institutions for TA-activities”* (Banse 2000a: 16). The research concludes with recommendations to further document practices and activities with a view to future collaborations. Those would be more sensitive to local peculiarities and open to different approaches of Technology Assessment.

It indeed remains uncertain whether TA will develop into a fully-fledged practice under its own name in the Czech Republic. This has several reasons. The first one is due to some “naming” problems. The translation of Technology Assessment is literally “Hodnocení techniky”, which seems a commonly accepted term to designate TA. The actors of the first generation already testify of difficulties when mobilizing this “tag” in the Czech Republic. Historically, they normatively refer to activities called TA, which are not TA and conversely things that can be considered TA but are not called like that (Banse 2000a). Machleidt (2011) refers to similar problem in France to make an inventory of TA activities for terminology issues. Reference is also made to the United Kingdom, where the term was supposedly politically laden as “Technology Arrestment”. More recently the TC has tried to bypass this terminology issue with a more elaborated translation *“posuzování dopadů technologií na společnost”* (impact of technology on society) or by staying with the English term.

The TC simultaneously intends to play several roles with regard to the development of TA. Some are more grounded in the deficit and evolutionary narrative than others. The first example is the so-called “knowledge sharer” role proposed for the TC as TA organization in the CR (Hebakova et al. 2016). Here, the center perceives its role to import and to disseminate TA knowledge stemming from other European sources. It is in line with the product approach of TA, it is through the valorization and dissemination of project results that TA would evolve and potentially be institutionalized. This view is

certainly grounded in the deficit narrative, although the organizational deficit is replaced by a deficit of knowledge.

A more challenging attitude towards the dichotomist, deficit and evolutionary approach conveyed in the initial PACITA project and broader evolutionary depictions of TA (see chapters 1 and 2) was most strikingly outspoken as follows: *“Adopting a TA role does not equate to taking a step an evolutionary ladder”* (Hebáková et al. 2016: 80). In the same paper, *“the authors challenge the notion of technology assessment as a set of ideas and practices to be adopted en bloc. Rather, TA provides a package of inspiration that may help organizations to broaden their missions within the field of national science, technology and innovation policy to include, for instance, parliamentary policy support, facilitation of stakeholder dialogues or citizens’ participation¹⁵¹”* (Hebáková et al. 2016: 74).

Once again, this is an indication for the evidence that TA may in fact facilitate a broadening out of the innovation governance and more particularly a diversification of organizational activities. The uptake of TA in this particular case is done in an incremental, selective and almost opportunistic fashion. On the organizational level of the TC and more particularly STRAST, TA is seen as an additional practice that complements the existing approaches the department is already making use of. This take-up is at first integrative and incremental. TA methods and approaches are perceived as complementary to already carried-out evaluation and foresight activities¹⁵². Under such a perspective, TA becomes an integral part of what the STRAST management presented to us as an overall policy elaboration circle consisting of a repeating sequence of Foresight – Technology Assessment – Evaluation. As TC is already doing foresight and analysis and evaluation, additionally endorsing the practice of TA would allow the center to cover this whole idea of a policy elaboration circle. The statement of staffers pointing to continuities rather than total innovations when they compare their practices with Technology Assessment often illustrates this incremental, sequential and integrative valorization.

¹⁵¹ It is worthwhile mentioning that this quote emanates from an article covering TA developments in several Central and Eastern European countries (Bulgaria, Czech Republic, Lithuania, Hungary). While the overall idea fits the particular Czech case, the mentions of citizen participation and parliamentary support concern more the overall cluster of countries rather than the Czech Republic specifically, where both of these tasks remain mainly declarative. Hence, this citation does not challenge the overall diagnosis of this chapter around the idea of a mainly Science-Government involvement in TA.

¹⁵² See also Loveridge 1996 for a discussion about synergies or disjunction between TA, foresight and evaluation. The debate can be continued with a more recent contribution of Forsberg et al. 2014 that compares different assessment regimes of emerging science and technology.

5.3.1.4. Networks and projects as a way forward?

We have seen that the TC engages in both issue-centered and dialogical activities, as well as it mobilizes realistic and relational expertise. Rather than opposing one another, both approaches complement each other. Some of the issue-centered activities can become starting points for more relational approaches. Indeed, some important stakeholders supporting TA were referenced to us after having participated in particular projects. We have also seen above that the issue-centered approach is fueled on pilot projects and/or imports of TA knowledge produced elsewhere in Europe. The way TA is incrementally implemented creates new opportunities of collaborations and outreach to decision-makers.

Over the years, the TC has increasingly assumed a leading entrepreneurial role for TA in the Czech Republic. However, it is conscious that if it wants to play a nation-wide policy-oriented TA function, it needs support from outside and it has to invest in building up relational expertise. Hence, a series of additional activities have also contributed to create a network of experts relating to TA activities where the TC tries to occupy a somehow central place. With the help of the other departments and links in the Science Academy, TC is capable of mobilizing those experts if needed. One can say that the TC has been successful in that task, as it has become a place of reference for TA and foresight – even for the 1st generation of TA (Machleidt 2011) as well as other more sectorial or specialized forms of TA (Rompotl, Rogalewicz).

Furthermore, and in the absence of structural support in terms of funding or formal mission statements, the TC needs to keep the momentum of practices alive, which was created with the help of PACITA. With this in mind, the STRAST people envision to maintain contacts with those experts and stakeholders in place through a sort of “discussion platform”. They insist on both the content input (concrete pilot project) on such a platform but that it also should *define* results in concrete organizational proposition on how to further develop and institutionalize TA in the Czech Republic. As a TC staffer puts it: *“We want to build an unofficial or discussion TA platform in the CR with people familiar with the concept that could help on TA projects in the future. Both on the academic and political side. We [TC] are the only ones that know the concept and are the ones with contacts. If there is a unit, it will most probably be the TC. The ambition is here. TC is very good at what we do. We are a big player that has evolved into new topics (foresight, TA) because of European projects or networks like ETAN, UNIDO. There was space to occupy in the Czech Republic.”*

In addition, a person from the NCP department of the TC that participated in some TA activities confessed that because the European projects increasingly require ELSI studies to be included, although there are some scattered competences in the CR, it

could profit from a more structured approach. And since no other actor is yet taking that place, it leaves potential room for the TC. The TA aims at further advertising this position and role so that people that need TA or are knowledgeable about TA perceive the TC as a relevant (or even central) actor to contact in the field for submitting project proposals¹⁵³.

5.3.2. Building a community of practice

The second dimension of the cognitive side of institutionalization is concerned with the look for a community of practice and its characterization. For this reason, we will look into some constitutive elements as put forwards by Varonne & Jacob (2004).

Firstly, there is an absence of national policy discourse about the practice of TA. We have seen above how language issues and multiple synonyms used do not help in that regard. There is also no national association or advocacy group. TC and STRAST staff are individual members in international associations of groups such as UNIDO or ETEPS but none of them are specialized in TA. However, TC delegates have started to attend EPTA meetings as observers. Education wise, there is also no training for TA on the national level. Some courses teach system auditing, social studies of science, ethics of technology but again no specialization in TA. However, Czech practitioners have participated in training sessions organized on the European level (PACITA and more recently EPTA). There are also no regular conferences dealing with TA. However, the TA East (Banse 2000a see above) end of the 1990s as well as more recently the PACITA project have created venues for raising awareness, engaging with relevant stakeholders. The Czech national partner of PACITA hosted the international TA conference in Prague in 2013 as well as co-organized the TA conference in Berlin. It will continue to do so for the TA conference in Cork, Ireland in 2017. This series of conferences reconnected with an old but forgotten tradition of European TA conferences in the 1980s and 1990s. Despite its international character, it was an important occasion to mobilize and sensitize Czech personalities such as R. Bizkova (former Minister of the Environment and at the time director of the Czech Technology Agency) for a keynote (Bizkova 2014). There is also no TA specific journal. The STSS runs an academic journal "Theory of Science". STRAST publishes the ERGO magazine. Both have a relative broad scope but none is specialized in TA.

¹⁵³In Addition, the TC holds one department acting as NCP for European Research, which is highly relevant for building connections and networks around European research projects.

More generally, the acknowledged uptake of TA practices as a specialized practice is only very recent. We have seen that this uptake is incremental, selective and happens in combination with other approaches in ways that currently fit the path-dependency of the Technology Centre and its Strategic Studies department.

5.3.2.1. The importance of boundary work

As we can see from the different generations of TA in the Czech Republic, the practice of TA has always developed in close connection to other practices and disciplines. More generally it has been considered as interdisciplinary at the crossroads of different approaches. The notion of “boundary work” provides a helpful hand in the analysis of the Czech case as it is insightful for the study of “*expansion of authority or expertise into domains claimed by other professions or occupations [...] monopolization of professional authority and resources [or] protection of autonomy over professional activities*” (Gieryn 1983: 791-792).

Indeed, the Czech case shows how the concept of Technology Assessment is not a once-and-for-all fixed category but rather is the theater of current struggles in terms of denomination, scope and its differentiations with other practices. This has historical, socio-cultural and linguistic reasons as we have seen above. The term technology assessment is not widely and explicitly used in the Czech Republic. Moreover, an important portion of actors does not envision TA as something new or different but rather consider (already existing) activities as relatively close to this concept.

At first, the origins of TA in its first generation in the Czech Republic are notably to be found in an STS and philosophy tradition. The reference to STS reflects other similar pathways of institutionalization such as in the Netherlands, where “the idea of Technology Assessment is firmly rooted in the academic field of Science and Technology Studies (STS)” (Ganzevles et al. 2012: 129). The situation is quite similar in Flanders (Delvenne et al. 2012: 84) or Austria (Nentwich et al. 2012: 35) where STS have played (and continue to play) a major role in the origins and development of Technology Assessment. With PIAS, it got increasingly influenced by economical and innovation considerations. More recently the TA practice at the TC was more closely intertwined with foresight, policy analysis and evaluation. Furthermore, Grunwald hints that currently some TA practices come closer to what may actually be “innovation TA” i.e. a TA that is “*part of regional and national innovation systems*” (2014: 19) and seeks to identify innovation avenues and actively contribute to shape innovations.

Secondly, there is the question about synergy or disjunction of TA with foresight and evaluation activities (Loveridge 1996). The Czech situation seems to be particularly close to the Dutch Rathenau Institute, which started with TA activities and broadened its

scope of activities to build a department devoted to Science System Assessment¹⁵⁴ (Ganzevles et al. 2012: 124-125). We can witness similar broadening of activities with other TA institutes such as the new Büro für Technikfolgenabschätzung (TAB) of the German Bundestag or the Committee for the Future in Finland. In Germany, the consortium running the Office of Technology Assessment in the federal Parliament has been renewed in 2013. Until 2018 new (private) actors such as the VDI/VDE Innovation + Technik GmbH (VDI/VDE-IT) will jointly take up a slightly renewed mission statement of the TAB. The cooperation with the private actor VDI/VDE-IT is supposed to additionally feed in elements of technology foresight, horizon scanning and trend-watching (KIT 2013, Ronzheimer 2014). An even more synergic process regrouping all sorts of forward-looking activities seems to have happened in Finland with the Parliamentary TA committee being renamed simply “Committee for the Future”, while a decade earlier it was still named “Committee for the Future and Technology Assessment” (von Berg & Petermann 2000:8).

To sum up, we consider the TC operates boundary work on its belonging to the system of Czech Science Academies while simultaneously aspiring to represent and federate the whole TA landscape. Conflicts of interest may thus arise¹⁵⁵. As an interviewee from a Czech University noted: *“Institutionalization at the national level is a good Idea. I believe in TA. It should probably be the TC doing it. It’s the right actors. Except that they are linked, they are under the Academy of Sciences, which is a competitor with Universities. It doesn’t represent the whole research landscape.”*

¹⁵⁴ “Not only managerial decisions, but also external factors changed the institute’s organization. In 2004, the Ministry of Science appointed the Rathenau Instituut an additional research task: Science System Assessment. According to the minister, information on the functioning of the Dutch research system was fragmented and inadequately systematic. [...] Science System Assessment (SciSA) addresses the following questions: how is science organized, how does it function and how does it respond to developments in politics, the economy, society and science itself? The science system is studied on the level of institutional arrangements (financing, programming, evaluation), the dynamics of existing and upcoming science fields, the functioning of research groups, and career opportunities of individual researchers. In 2006, the evaluation committee concluded that the conditions for taking up the Science System Assessment task needed substantial improvement. Additional governmental funding was needed. Furthermore, it advised to make SciSA a formal institutional task, to be taken up in its government decree.” (Ganzevles et al. 2012: 124-125).

¹⁵⁵ The comparison with the Dutch case where TA needs to compose with the practice of Science System Assessment points to another element of the boundary work: the exclusive expansion or monopolization of authority. In the case of the Netherlands: *“The 2006 evaluation committee noted that the further strengthening of the Science System Assessment task fortified tensions between the Rathenau Instituut and the Royal Academy of Sciences. A conflict of interest emerged. The Science System Assessment requires an independent evaluation of science. At the same time, the Rathenau Instituut is embedded in the academy that represents scientists’ interests.”* (Ganzevles et al. 2012: 126).

6. Case discussion and intermediate conclusion

The local and contemporary remaking of TA in the Czech Republic seems to align with broader evolutions in the field of TA that can also be observed elsewhere in Europe. Throughout the different generations of TA practice in the Czech Republic, we have seen how it emerged in particular institutional contexts, pertained links with different social spheres, and gained inspiration from other practices and disciplines. Concerning the practice of TA at the Technology Centre, a number of characteristics stand out. Following the inclusive modeling approach, the current strategy aims at building TA on the involvement of the Science and Governmental sphere. Society is present at a lesser extent, which results from a relative opening to different stakeholders in the STI system. Although stimulated through recent European projects (PACITA and CIMULACT), systematic citizens' input beyond these projects within the TC's strategy of developing TA is only hypothetical at this point. It would arguably be more accurate to speak in terms of TA for innovation governance rather than Parliamentary TA.

Given the lack of organizational anchoring outside of the TC (no mandate, no defined client, no dedicated funding, no legislative proposal whatsoever) the institutionalization of TA is above all an institutionalization of practices pursued by a repetition of networked and project-based activities. The latter are difficult to account for with the organizational dimensions of institutionalization. It is also unsure whether it will result in more regular and legitimate expectations formulated by the political systems towards the TA practice and its promoters. It therefore becomes important to have a closer look into those practices and their development. STRAST follows the policy analysis tradition of TA. This is notably due to a path dependency to the organization's usual way of working, which has already a tradition of policy analysis and is furthermore rooted in a science-for-policy and evidence-based approach. Furthermore, TA work is mostly understood as "product" and the expected impacts are so-called "hard" impacts - ideally initializing actions in the political sphere (following Decker & Ladikas 2004). Nonetheless the practice of TA contributes to a "broadening innovation" in the sense that it sheds light on the non-technological and non-scientific and non-economic aspects of innovation and opens it to a wider range of actors (Van Oudheusden et al. 2015). Indeed, TA rationales and TA methods are introduced into existing practices and combined with other rationales and methods such as foresights, evaluation, or policy-analysis. At the level of practitioners, at the organizational level and at the landscape level, this contributes to and eases a shift in the understanding and performance of innovation governance. This "broadening out" notably opens up the intelligence base for STRAST's activities (from initial mathematical and quantitative activities such as scientometrics to foresight and more recently Technology Assessment) takes into account the views of additional actors (mainly stakeholders, not so much citizens). By doing so, it incorporates more qualitative and comprehensive data in its work and

slightly opens up the type of information it uses and provides to its addressees. Nonetheless, the TC's main approach remains dominated by a product approach that is supposed to deliver scientific evidence for so-called rational policy-making.

The TA approach engaged by the TC in the Czech Republic embraces a multi-level and distributed governance approach in the way it addresses public action. While the inclusive modeling still remains entrenched in clearly defined spheres of activities where government, parliament, science and society are demarcated spaces of activity, the TC perceives and acts upon an environment where the boundaries between those spheres are increasingly blurred. The dialogical strategy of fostering synergies and consensus among the different actors of the innovation system reflects a shift from linear science policy to innovation governance. With its platform objective, the TC clearly endorses a more complex and systemic understanding of innovation processes. Additionally, adopted TA approaches have contributed to further broaden the understanding of innovation processes and their governance beyond solely technological considerations and narrow understanding of experts. However, evidence-based policy-making is presented as a current challenge and future objective in the country. The openness to uncertainty, local and plural sources of knowledge is rather limited. Indeed, there are strong expectations towards imports of TA knowledge produced elsewhere in Europe. International contacts and standards play an important role in the development of the practice. This is sometimes contrasted with emphasis on local conditions, which make some cross national research settings hard to apply in the Czech Republic, and goes along with calls from more context-sensitivity in the methodologies and research frameworks of international projects. Nonetheless, the people familiar with foresight are a bit more cautious with regard to the evidence-based rationale as they also run into similar problems where policy-makers don't see their production as scientific as other (more evidence-based) policy advice or innovation governance more broadly.

The project-based and networked approach to TA pursued by the TC not only challenges the organizational dimensions of institutionalization. The Czech case is also particularly interesting regarding the cognitive aspects of institutionalization and more particularly the issue of specialization vs. hybridization. Taking together the product approach of TA, the valorization of the content of concrete projects, the expectations of "hard impacts" and the synergies and boundary work with other practices, we can follow Jasanoff (1995) and point to the hypothesis of "substantial equivalence" with those other policy-advising practices. What seems to matter above all are the reports and messages delivered to policy-makers regardless of whether they have been obtained through evaluation, foresight or TA. Such a situation may not facilitate the specialization and differentiation of TA with regard to the other practices and the chances of becoming a branch of activity of its own right (i.e. with explicit name reference and organizational

aspects). Following to Machleidt (2011: 196) “*when an intensive sharing of knowledge and joint actions are in progress, there is no reason for a forcible separation of Foresight and TA activities and processes*”. The author additionally points to commonalities between TA and foresight in the social questions they address, the social interests in the background, and the conception of the development of STI. This gives credit to the hypothesis that TA may in fact merge with other practices in the future (Rip 2012, Loveridge 1996, Kuhlman et al. 1999). A hypothesis that seems increasingly credible in this case since the actual terms and appellations are considered irrelevant and the traditional binary deficit discourse (having/not having TA) is fundamentally challenged by most Czech practitioners.

Moreover, it also applies to the Czech Republic case that the process of structuring an interdisciplinary community of TA practice is not without its own challenges and raising additional questions about the future and the remaking of Technology Assessment. The short duration of interdisciplinary projects and the subsequent reassembling of researchers and practitioners afterwards around new projects (which are not necessarily interdisciplinary) impede the possibilities to fully build up and sustain interdisciplinary knowledge and approaches. Likewise, in the TC and STRAST more particularly, the important share of temporary project funding to staffers having to move about between different projects, affiliations, and disciplinary allegiances. This becomes particularly critical since the STRAST leadership acknowledges the need for continuing TA projects to build up expertise and capacities. It therefore remains particularly dependent on project calls and other funding opportunities that provide possibilities for TA or TA-like approaches.

Finally, whether the “innovation TA” or TA for innovation governance is compatible with TA’s role as “*critical observer of R&D policy-making activities*” (Hennen & Nierling 2014: 13) remains an open question in the Czech Republic, especially since the ideas of early warning and looking into possible downsides of socio-technological developments attract little interest and have no real roots within the other practices of the TC. It however echoes a current and broader debate launched in the TA community about its self-understanding around the tension between critically assessing specific socio-technical futures or positioning one’s self or being positioned in a production or promotion role of these visions (Lösch et al. 2016). This tension needs to be placed and concretely addressed in the different understandings of practices of TA: as research practice, as advisory practice, and as design practice.

1. Introduction

After examining the dynamics of the PACITA project and the various activities aiming at further institutionalizing policy-oriented Technology Assessment in Wallonia, Portugal and Czech Republic, it becomes necessary to re-evaluate the futures of Technology Assessment. In particular, two evolutionary assumptions will be empirically confronted and conceptually revisited in this discussion chapter. The first one considers the evolution of TA as a linear progression leading to new institutional creations in an increasing number of countries. The second one concerns the rationale of Technology Assessment and its performance in terms of opening up and reflexivity. Indeed, in chapter 1, we identified a strong theoretical and programmatic narrative that envisions a concomitant progression of TA along two analytical dimensions. The first dimension consists in an evolution of the conception of political action from a single institutional locus of decision-making towards multi-level, multi-actor governance actions. The second dimension ranges from a positivist vision of unsullied and universal science to a post-positivist and “encultured” understanding of knowledge, which also integrates values and uncertainty.

We put into perspective the multiple processes of remaking caught between the reproduction of PTA as-we-know-it and the multiple transformations it undergoes when it breaks new land. This process was first analyzed with a comprehensive view on institutionalization, taking into account both organizational and cognitive dimensions. On the structural side, the inclusive modeling allows to take stock of a relative diversity of TA futures, when it comes to involving different spheres of activities. The cognitive dimensions also showed contrasting results as to the specialization or hybridization of the TA practice and how it makes community. The results highlight how the idea of simply creating new single, national, specialized and dedicated TA organizations is challenged in multiple ways. When placing the performances of our case studies on the knowledge-policy-making graph, one notices that the progression on the policy-making axis outweighs the evolution on the knowledge axe. This remaking that we label “evidence-based governance” actually contrasts not only with the initial objective of the European PACITA project we studied and participated in but also with the futures of TA envisioned as more reflexive and opened up in TA literature. Both observations require reconsidering the above-mentioned evolutionary narrative for a more complex and paradoxical understanding of the future of TA, which should actually be written in the plural. In an interpretative stance, we argue that this “evidence-based governance” is coherent with a simultaneous shift away from the institutional deficit of TA (creating

new institutions in newcomer countries) to a renewed strategy of resorbing a knowledge deficit (making TA knowledge available to a wider number of countries). Universal science supposedly supports multi-level, multi-actor governance as it allows knowledge produced in one place to travel and serve a wide spectrum of actors and decision-making arenas. The consequences of this shift are crucially important to explore the remakings and futures of Technology Assessment, as they put to the fore the issue of subsidiarity of both the production and the use of TA knowledge and their implications.

2. Assumptions about institutionalization

Arriving at this point, it is useful to sum up the first research questions that have crossed this thesis. This started with an interest in the ongoing institutionalization and possible future forms of Parliamentary Technology Assessment, which inevitably led us to considering the “remaking” of TA. This ambivalent notion of “remaking” describes both the reproductive and transformative processes at play when TA breaks new land. It also allows to reconsider some taken for granted claims of directionality as to the quantitative (more TA institutions) and qualitative (more evolved and up-to-date TA institutions such as network organizations) developments of Technology Assessment.

When we started this research, the future of TA was envisioned as “more of the same” (Schneider & Lösch 2015). There was a momentum during which a series of developments converged at the interplay between the Science in Society directorate at the European Commission, prominent political support and the entrepreneurship of some PTA organizations members of the EPTA network. At the same time, in Portugal and Wallonia, TA was slowly making its way into the political debate. The future looked promising for the development of Technology Assessment and it was likely that new PTA organizations would be inspired by the diversity of those already in place throughout Europe. This assumption is reflected in the reproductive character of the notion of “remaking”. All this was before 2012, the year in which two PTA organizations were either eliminated or downsized (IST in Flanders and DBT in Denmark). These events broke with the belief that TA was undoubtedly here to stay. Its expansion to new horizons could not anymore be taken for granted if some prominent TA institutions were abolished in their home environments.

Another assumption about the futures of TA can be found in a series of programmatic literature that promotes different forms of project-based and network forms of TA. Other authors envision a future where TA would converge with supplementary knowledge sources for decision-making. The proponents of these organizational forms of TA claim the superiority of their models above “older” or contemporary forms of TA

by making reference to theoretical diagnoses such as reflexive modernization (Beck et al. 1994) and a reflexivity pathway more precisely (Delvenne 2011) or by appealing to the overarching idea of “opening up” (Stirling 2008, Ely et al. 2014) outputs and “broadening out” (Ely et al. 2014) inputs of Technology Assessment.

These different assumptions were conceptually and empirically confronted with the findings stemming from our three national/regional case studies (chapters 3-5) and an analysis of the PACITA project (chapter 2).

A first dimension of remaking is a conceptual transition from the quantitative (more organizations created) and dichotomist (institutionalized or not) view on institutionalization to a more plural and complex conceptualization consisting of organizational and cognitive aspects (see table 4). As we will develop below, both aspects can be present to various degrees and reveal different forms and natures of institutionalization.

PLURAL UNDERSTANDING OF INSTITUTIONALIZATION AS A PROCESS		
Structural / Organizational dimensions		Cognitive dimensions
Inclusive Modeling		Discourses on Technology Assessment
involvement of: - Parliament, - Government, - Science, - Society	Levels: - micro (project), - meso (organization), - macro (institutional landscape)	Characteristics of a community of practice
Use in Policy-making and impacts on Policy, Science & Technology, and Society		Specialization

Table 5: Organizational and cognitive dimensions of the institutionalization process

Furthermore, the evolutions of TA in terms of opening up and reflexivity have been analytically explored through two different dimensions. The first dimension consists of an evolution in the conception of political action from a single locus of command and control policy-making (generally the Parliament) towards multi-level, multi-actor governance actions. The second dimension ranges from a positivist vision of unsullied and universal science to a post-positivist and “encultured” understanding of knowledge, which also integrates values and uncertainty. Those evolutions often go hand in hand: the progression on the political action axis is concomitant with the advancement on the knowledge axis and vice versa (see Figure 13). It is in particular the coupling of these two processes that the findings of our case studies have challenged. It urges us to reconsider our understanding of TA’s evolution and leads us to open up new, unforeseen research avenues.

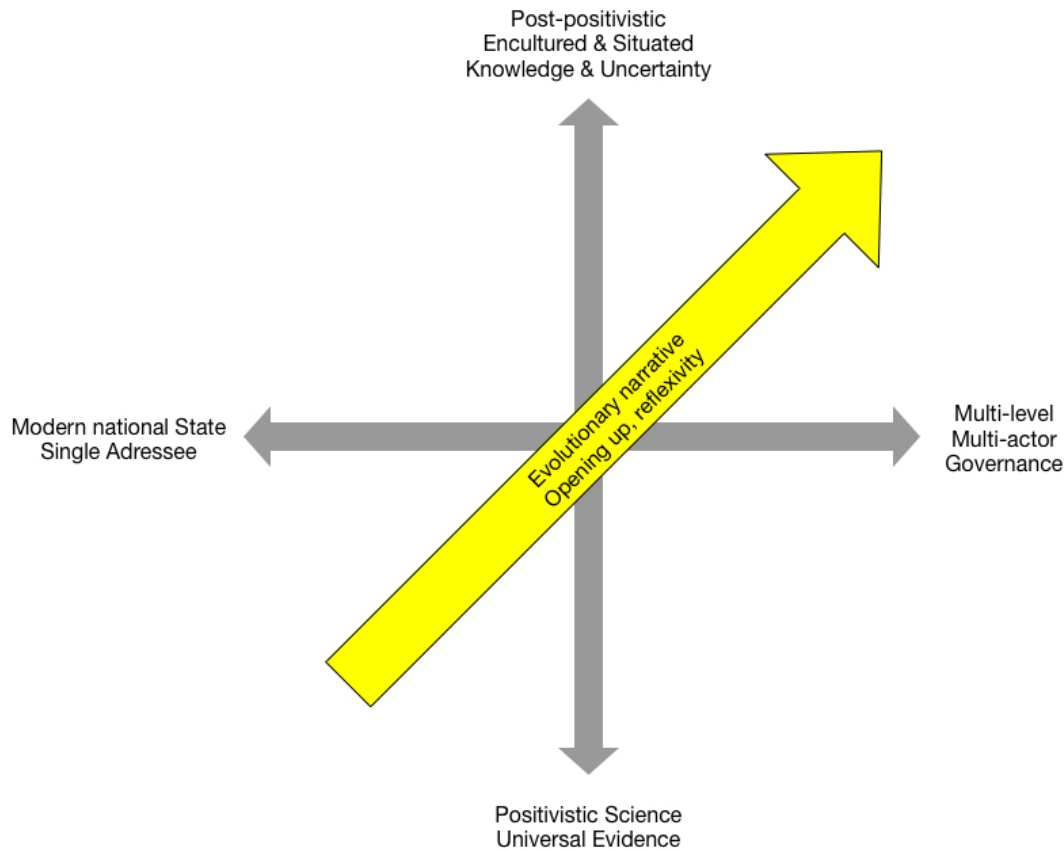


Figure 13: Evolutionary assumption of TA futures - concomitant evolution on both the decision-making and knowledge axes

3. Comparing the institutionalization

Despite the downsizing of two notable TA organizations mentioned earlier, the overall TA community has grown in unforeseen ways over the last years. New players got interested in the practice of Technology Assessment and there have been developments in the way this practice organizes and makes community. In addition, the “TA community” i.e. established actors in the field, have proved both a patronizing and an inclusive attitude towards these “newcomers”. At the same time, the inclusiveness and growth of the community also comes with an increased diversification.

To start taking stock of this complex process of reproduction and diversification, we will quickly review some of the main findings of our 3 case studies based on the cognitive and structural dimensions of institutionalization. On the organizational level, the inclusive modeling approach (Ganzevles et al. 2014) was designed to grasp an increasing diversity of TA practices and TA institutionalization with regard to the involvement of various spheres of activities in different aspects of the TA practice. We

additionally looked into the use and impact of possible TA results in the political, social and S&T spheres. On the cognitive level, we compared how TA makes up a community of practice and what discourses TA is invested with. The latter is particularly relevant with regard to the issues of specialization as opposed to hybridization or merging of TA with other practices of policy-advice or public discourse.

3.1. Organizational aspects – inclusive modeling

In Wallonia, current developments show a **Government-Parliament-Science-Society** involvement in TA. Indeed, the proposed TA board would accommodate representatives of Government, Parliament, Science and organized Civil Society. Furthermore, it plans to make use of participatory methods and employ “generalist scientists” (Serret 2011, our translation). According to the existing decree proposal, Government, Parliament and even some groups of citizens could propose topics for TA scrutiny. In Portugal the discussion has evolved around a **Parliament-Science** involvement in TA and more recently a possible opening towards both governmental and societal actors for funding purposes. In the Czech Republic, Parliament is the great absentee from efforts to institutionalize TA. Here it is a **Government-Science-(Society)** model that prevails. Different European, national or regional administrations finance TA studies carried out by a strategic studies department of an initial technology transfer office more or less formally linked to different institutes of Academy of science. In the course of particular project stakeholders can be more or less involved and part of the work outsourced to other scientific organizations. However, citizen participation is not currently envisioned as a generalized practice in the national context.

On another level¹⁵⁶, we saw in chapter 2 that the PACITA project valued the inclusion of society via the use of participatory methods beside the involvement of the Parliamentary and S&T spheres in TA. As the inclusive modeling approach was conceived during the project itself, the opening to government as an additional sphere of activity for TA resulted notably from the confrontation of perspectives and learning induced by and with the newcomers. This is notably reflected in the shift from a triangular representation of TA between Science and Technology, Parliament and Society to a model of four spheres, including the Government. It was subsequently given more attention with the semantic shift towards policy-oriented Technology Assessment, which also occurred during the course of the PACITA project.

¹⁵⁶ No single model can be determined as PACITA is a consortium, which overarches the realities in specific countries or regions and additionally emphasizes its diversity.

3.2. Cognitive aspects: community of practice, relative specialization and TA discourses

In Wallonia, there has been both a history of previous institutionalization of TA and a concentration of TA expertise in universities. During the last 15 years, the TA paradigm supported by university actors shifted from a social-concertation TA (mainly rooted around the University of Namur) towards a more EPTA-like TA and participatory TA (more closely connected to the University of Liège). Despite punctual exchanges and collaborations around single projects, there are no formal and sustained arenas that allow for the construction of a fully-fledged community of practice. TA practices encounter difficulties in terms of disciplinary specialization as it is mainly developed in universities either in some specialized technological fields (Information Technology mainly for the University of Namur) or as merely one research area among others (combined with STS, public policy analysis and participatory methods at the University of Liège). In that sense TA exists more as an object of study rather than a systematic and embedded mode of STI governance. This existing TA capacity in Walloon, French-speaking universities contrasts with the decree proposal of installing a TA capacity organizationally set apart from other neighboring practices such as foresight or evaluation and specially dedicated to the practice of TA only. Indeed, the political path of the most recent TA project in Wallonia can also be read as a process of tailoring and specialization. TA was initially invested with a wide variety of missions: technological scouting, legal advice, public participation. Over the years, these TA-like missions got assigned to or taken up by other public or administrative bodies (Technology Stimulation Agency, research administration, Walloon Institute for Evaluation, Foresight and Statistics, Committee of Democratic Renewal). This specialization potentially comes at the price of emptying the TA proposal of its substance. Valenduc has warned that this process would bear the risk of *“evacuating technological options”*¹⁵⁷, eliminating the necessity for TA by arguing that several of its basic components would already be taken care of and scattered throughout the institutional landscape.

Portugal is the only case where considerable efforts are put into the building of a community of practice. This includes the PhD program where students obtain a specialized PhD diploma in TA. In this framework, conference series are also organized (doctoral conferences and winter schools). Recently the TA observatory was created as a specialized research unit within the CISC.NOVA research center. There is also a national TA association (the GrEAT network) and some TA related publications (IET, GrEAT Topicos). The practice of TA here as well nurtures exchanges with other disciplines such as social sciences, STS, foresight, evaluation, engineering, and policy analysis. However,

¹⁵⁷ G. Valenduc mentioned this French pun *“évacuation des choix technologiques”* (evacuation of technological choices) in reference to the French name for TA *“évaluation des choix technologiques”* during the conference in the Walloon Parliament *“new technologies in debate”* held under the framework of the PACITA project.

gathering more active members across the country and from outside the PDAT group remains a difficulty for the network. On the political level, TA is also expected to be a specialized practice, especially Parliamentary TA for which particular requirements are expressed, such as timeliness, communication, problem-framing etc.

In the Czech Republic, the practice of TA has always been carried out in institutes also invested with other activities – STS and philosophy of science for the CSTS or science park activities with PIAS. This is not different today, as TA activities happen in the Technology Centre, which was originally a technology transfer office and now conducts a wide range of other research and policy-relevant activities. Moreover, the hybridization of the practice is clearly outspoken (Hebakova et al. 2016). TA is not judged as either totally different nor should it be used distinctly from other policy-information practices such as evaluation, foresight or innovation studies. Also there is no national association, journal or regular conference centered specifically on TA in the Czech Republic.

The PACITA project invested a lot in capacity building activities clearly targeted at initiating and consolidating a European community of practice: organizing TA conferences, establishing TA practitioner trainings and editing a dedicated magazine (volTA). The project also conveyed a particular understanding of TA centered on the idea of single, specialized and dedicated, national TA institutions.

As we have already mentioned in chapter 1, the structuration of a community of practice of TA happens mainly on the international level (except for the German-speaking NTA community, which is still a transnational one). Even in the “established” TA countries, a fully-fledged community of practice cannot be observed on a national level. This trend of internationalization was continued with the PACITA project and observed in our case studies. Even after the PACITA project and its dedicated resources for capacity building, similar initiatives are continued on the international level. One can for instance mention the European TA conference taking place in Cork in 2017 co-organized by several PACITA partners (established and newcomers together), continued practitioner training activities for EPTA members and even the recent creation of a network of more specialized Technology Assessment communicators (ETAC). How such an international community exchanges and deals with its own diversity will be addressed in a later section of this discussion.

3.3. Discourses of TA

The discourses are another part of the cognitive institutionalization of TA. Beyond the community of practice and the question of specialization, discourses reveal how TA is conceived and how it should develop in the particular national/regional contexts that

we have studied. The discourses we identified in the case studies partially subscribe to the evolutionary assumptions depicted above. At the same time, however, these statements were also substantially challenged. Indeed, the identified discourses equally hold elements to overcome these very evolutionary assumptions and their corollary dichotomist picture of TA institutionalization. As discourse analysis teaches us, discourses may not necessarily be logically consistent and exempt of contradictions (cf. Billig 1991, Van Oudheusden 2011). Instead of viewing those two attitudes as mutually exclusive, their combination reveals an interesting tension that will accompany us throughout the rest of this discussion. We argue that the reproduction of the same, with explicit references to existing institutes and taxonomies, goes hand in hand with the flexibility with which those taxonomies are invested as well as with more substantial changes to the TA concept and rationale.

First, we notice rather ambivalent attitudes towards the deficit discourse of Technology Assessment institutionalization. At times our interviewees endorsed this view and reflected upon their country or region as “lagging behind” or “missing” something in comparison to other supposedly more “advanced” countries, i.e. those having formal TA infrastructures (ideally national, specialized, dedicated, national, single organizations) and practical experience (ideally with participatory methods). But the deficit and evolutionary assumption had also got challenged in a number of ways. Firstly, by getting into the fieldwork, it became clear that newcomer countries were not starting from zero: all three non-PTA countries actually had already a TA history, sometimes dating back from several decades ago. This history of experience building, collaborations or even attempts at institutionalization was often downplayed in the project description or project partners. This omission possibly reinforced the strategic deficit description embedded in the project’s architecture and rationale. Furthermore, the historical actors (mainly in the Czech Republic and Wallonia) have changed in the meantime. Subsequently, the deficit narrative puts these new actors in a more central and important position in their respective countries or regions. Nonetheless, some actors resisted the narrative of their country or organization as “lagging behind” and thereby being “underdeveloped” just because of a specialized TA organization or the practice of participatory Technology Assessment had not taken roots as elsewhere in Europe. For instance, in the Portuguese case, some actors contest the idea of a permanent, specialized and dedicated organizational solution. Interviewees stress the *ad-hoc* way in which public STI discussions (or informal TA activities) have been taking place and supposedly matching the national political culture. Other actors question the value of institutionalization of participatory Technology Assessment at the national level. In the Czech Republic, existing capacities are often put forward in strategies that highlight process equivalence between TA and other forms of knowledge production for STI governance. The specialization in terms of practices (i.e. the differentiation with neighboring practices) and organizationally (a special department or organization) is

contested in a deliberate strategy of hybridization and merging of TA with other practices. In both countries, and to a certain extent in Wallonia, the national (or regional) character of TA is also questioned. Reference is made to Europeanization and internationalization of STI policies and the fragmentation of STI decision-making among different public and private actors. In this context, participation in supranational project or foreign knowledge imports could to a certain extent be substituted to national TA capacities.

Secondly, the researched TA entrepreneurs make extensive reference to the taxonomies of TA and more concretely to specific TA organizations. By adding these developments to the picture, the categories themselves are likely to change or require revision. In Wallonia, the “independent” or “interactive” model has drawn the most attention. Reference was often made to the Danish Board of Technology. In the Czech Republic and Portugal, all the options (Parliamentary committee model, Parliamentary Unit, independent/interactive model) were reviewed on multiple occasions by both scientific and political actors. In Czech Republic, the Technology Centre soon opted for an “independent” model by stressing the distance from Parliament and the privileged relationship with the public administration and ministries. Interviewees in the newcomer organizations also insist on the equivalence in terms of project management with other independent institutes (mentions to DBT, NBT or IST were made). In Portugal, a preference for a model inspired by the Parliamentary Unit was favored and the British POST was often cited as an example in that regard. Given the limited resources, a Committee model was *de facto* declared for the period of the hearing process in Parliament before the rapporteur suggested opting for an independent model to open up funding possibilities outside of Parliament. In the latter case, the outsourcing practice of STOA or TAB (although not commonly considered as an “independent” or “interactive” model in TA literature) was heralded for the actual conduct of TA projects. In the end, we have three contrasting propositions for an “independent TA model”. However, meanings and features invested in this category reveal a great diversity across the cases and a relative discrepancy compared to the independent models¹⁵⁸ existing so far. In the Czech Republic, the concept is above all used to stress the distant (or non-existent) relationship to Parliament and instead privileged relationship to governmental bodies. In Portugal, the independence is mainly understood in financial terms as the latest proposal foresees funding from sources external to Parliament. In Wallonia, it is

¹⁵⁸ The independent model proposed by Enzing et al. (2012) is indeed a particular flexible category. The features of this model are a “*relative distance from Parliament, but parliament is its main client. In most cases also other target groups are considered as client. Typically, these institutes have missions that go beyond informing the parliament and also include stimulating public debate on STI issues.*” (Enzing et al. 2012: 13). Additional precision is given concerning the government and the public as additional addressees. The authors also highlight a “*relatively large degree of autonomy*” (Enzing et al. 2012: 13). This very model also has the largest staff and budget of all three models.

envisaged for the purpose of stimulating public debate and serving both the Parliament and Government. In both Czech and Portuguese cases the issue of stimulating public debate is relatively absent.

4. What institutionalization and institutionalization of what?

The efforts undertaken by the different TA entrepreneurs indicate how the cognitive or organizational dimensions of institutionalization are emphasized differently across the case studies. There are also significant differences between actors within a given country/region. In Wallonia, the TA entrepreneurs invested significant resources in defining the organizational contours of a future TA capacity. In Portugal, the contrast is striking between two approaches. The official PACITA partner and the Parliament were putting efforts in the definition of an appropriate organizational form. Although, also collaborating towards this first objective, the GrEAT network rather invested in the cognitive side of institutionalization and more particularly the development of the practice of TA. In the Czech Republic, the organizational developments are minimal and do not exceed the limits of the Technology Centre itself, now having a small TA sub-unit in the STRAST department. Despite being openly mixed with other practices, the development of TA in the short term is primarily viewed as an accumulation of projects. Concerning the PACITA project, it is safe to say that the project was quite balanced when it comes to addressing the organizational dimensions of institutionalization and the strengthening of the practice of TA. Nonetheless, in the chronological order of the project, the organizational aspects were addressed first with a description of the existing TA landscape and research into opportunity structures in newcomer countries (task 2.1 of work package 2). Towards the end of the project the efforts were directed towards the pilot projects (work package 5, 6 and 7) and the learning objectives they conveyed for the newcomers. We will come back to the shift between two different visions of “expanding the TA landscape” (initially a concise task of a work package, which unexpectedly continued in an open-ended way until the end of the project).

Regarding the possibility of institutionalization of a network and project-based model of TA, the results are rather ambiguous and present some methodological difficulties. The network model itself is only in its infancy and remains primarily at a proposition stage. It is also sometimes just a minority project as opposed to more classical forms of remaking Technology Assessment. On the conceptual level, TA developments that are only project-based (TA as a mere succession of individual projects) would only concern the micro-level of the structural dimensions of institutionalization. For the other dimensions, the logic of the network model actually goes against the grain of the organizational understanding of institutionalization we investigate in this thesis. By the multiplication of punctual ties and relations and the reluctance to engage in more formal

organizational forms it becomes difficult to measure the degree and nature of institutionalization of this model on the structural side. Furthermore, in terms of discourses, the network model is only explicitly mentioned in the Portuguese case. In Wallonia and the Czech Republic, it is our analysis that draws parallels between the theoretical network and project-based TA models and the actual developments observed. In other words, while it becomes an action category and a theoretical reference in the Portuguese case, the network and project model of TA is only an *ex-post* analytical category in the two other case studies. There are no mentions of this literature by the main TA promoters in Wallonia or the Czech Republic. These models are also mainly invoked for their supposedly cost saving character. They are supposed to run on very limited human and financial resources - pooling existing knowledge and avoiding bureaucratic procedures. The recapitulative table 5 compares the different elements of comparison between the case studies and the PACITA project.

PACITA	Wallonia	Portugal	Czech Republic
Parliament-Science-Society → Parliament-Government-Science-Society	Parliament-Government-Science-Society	Parliament-Science	Government-Science-(Society)
Organizational & Cognitive	Organizational mainly	Organizational & cognitive (different actors)	Mainly cognitive
Specialization	Specialization	Specialization	Hybridization

Table 6: Comparison of the three national/regional case studies and the PACITA project

5. Conceptions of political action and knowledge

To adequately capture the increasing diversity and remaking of TA, the sole study of institutionalization is not sufficient. We also have to examine the performance of these new TA enactments with regard to the related conceptions of decision-making and knowledge. The concepts used to study institutionalization fall short of some important nuances in that regard. Indeed, the inclusive modeling approach does not reflect on the content and definition of what is behind the categories of, for instance, “Science” or “Society”. Firstly, In Wallonia, the paradigm shift from a social concertation TA to a more EPTA-like and participatory TA could result in equivalent levels of societal involvement. However, the rationale changes fundamentally from the involvement of a part of the organized civil society (mainly social partners) to the participation of “ordinary” citizens. Secondly, in the Czech Republic the recourse to participatory methods reflects yet a different reality, where stakeholder participation is judged pertinent but the TA proponents consider citizen involvement more difficult. In this model, both stakeholder involvement and citizen participation however fall under the same generic category of “society”.

Moreover, the analytic separation between the spheres of Parliament and Government does not tell us how policy decisions are made and how the process of policy-making involving Science, Technology and Innovation is envisioned. This is where the additional presentation of each case study along the two continuums of knowledge and policy-making provides an added value. Indeed, this original analysis provides additional clarity as to how TA knowledge is imagined, who should be involved and how it would feed into decision-making processes. On this two-axed graph, we will not only place the developments of each case study. We will also aim at interpreting the cluster where most of the TA developments have been occurring in comparison to both the objectives of PACITA and the programmatic forms of networked and project-based TA.

5.1. Decision-making axis

Let’s first address the decision-making axis that represents a continuum ranging from single public institutions clearly identified that operate in a command and control fashion to multi-level, multi-actor, public and private governance constellations. Applied to TA, we find on the one side the idea of a single decision-making addressee, most prominently the parliament. On the other side, we find a broader and more complex definition of decision-making involving different actors (public and private), at different levels of power and where policy actions are much more diverse than only to legislate or control the government. They can for instance range from agenda setting, conflict mediation to self-regulation of concerned actors. The political arena is conceived in

broader terms that surpass the modern public institutions, with references to platforms, networks, innovation systems and participation of stakeholders and citizens.

The normative TA proposal carried by the PACITA project resulted in a relatively “advanced” score on the policy-making axis. It widened its self-understanding with the notion of “policy-oriented TA” and has proved a certain degree of openness to multi-level governance, including regional polities, the national level of policy-making and addressing the Grand Challenges on the European scene. It opened up the practice of TA to a wider variety of actors. Academies of science, parliamentary committees or offices, independent offices and NGOs or university research centers were called to perform and promote TA. Different stakeholders or citizens were consulted in the process of pilot projects. Results have been disseminated to a broad spectrum of addressees including national and regional parliamentarians, different levels of public administration, civil society organization and private companies. The project further recognized the plurality of interest groups and advocacy mechanisms in European policy-making and was itself dedicated to bringing the voices of “ordinary citizens” into this arena¹⁵⁹. As reflected in the TA manifesto, the national (or regional) level remained a major preoccupation for the PACITA project until its completion. Despite addressing transnational problems such as the Grand Challenges, the project stressed that each country would have to find nation specific institutional arrangements in order to fruitfully institutionalize TA. Based on existing practices and given the consortium’s composition, the project promoted the idea of single, specialized and dedicated institutions of TA on the national or regional level.

Concerning Wallonia, the first thing to note from the outset is that the TA developments are taking place in a multi-level setting. How to concretely work for both government and parliament, on the one hand, and for the French-speaking community and the Walloon region on the other hand, have been crucial questions at the heart of the debate of installing a TA capacity. The TA institute is not only presented as a new institutional creation but equally as a device linking the worlds of science & technology, politics and society. *“It’s a revolution in governance”* (Serret 2011, our translation) said one of the ministers in charge. In the current existing decree proposal, the board is supposed to have a large membership base and to represent a broad spectrum of societal actors ranging from social partners, scientific organizations and organized civil society as well as representatives of both government and parliament. It is important for the members of the (potential) future TA institute to be well connected with a network of experts. The envisioned model also aims at directly involving citizens in different phases such as agenda setting but also via consultation throughout the conduct of TA projects. In

¹⁵⁹ See page 4 of the information booklet the citizens received prior to the consultation http://citizenconsultation.pacitaproject.eu/wp-content/uploads/2014/10/PACITA_Booklet_International_WEB.pdf (accessed 17th of April 2017)

Wallonia, TA is notably seen as a way of reconnecting citizens with policy-making arenas.

In Portugal, the situation is slightly different and it results from a convergence of two different institutionalization dynamics. On the one hand, there are TA developments exclusively concerned with the Parliament. Several actors emphasize the peculiarities of Parliamentary TA as opposed to other forms of TA. On the other hand, there is the GrEAT network (including the PDAT), which roots its activities in a much more distributed and multi-actor understanding of governance. The latest proposal for Parliamentary TA, summing up the hearing process and taking into account the financial restrictions, tries to merge both movements. By doing so, new public (governmental agencies), semi-public (foundations) and private actors (industrial actors) potentially enter the TA arena via funding opportunities, opening up possibilities to sit in the organization's board. The digital library solution does not only aggregate knowledge produced by different national and international sources; it is also meant to distribute this knowledge back to various (not clearly identified) addressees who deal with decision-making in socio-technical areas.

The Czech Republic also reveals a complex picture of governance. Addressees are project-dependent (in our interview request we were mainly directed towards the stakeholders and experts who participated in pilot projects) and include different European, Czech national and regional administrations. Along other activities that the TC and more particularly the STRAST department undertake, the knowledge produced is aimed at benefiting the Czech innovation system and its different public and private actors. In the present case, one could even speak of TA for innovation governance. This idea is further reflected in the plan of setting up a platform of TA knowledgeable people. Lastly, it was notably (although not solely) the development in Czech Republic that led to a semantic shift away from "parliamentary TA" to "policy-oriented TA" in the course of the PACITA project. The latter term should grasp a broader and more diverse understanding of public decision-making than the exclusive legislative activity.

5.2. The knowledge axis

On the knowledge axis, we find a continuum that opposes, on one side, a positivist and universalist view science and, on the other side, a wider, post-positivist notion of "encultured" knowledge taking into account values, uncertainty and ambiguity. Applied to TA this distinction would oppose evidence-based TA approaches, which in literature have been labeled "expert-oriented TA" or "classical TA" (Bellucci, Bütschi, Gloede et al. 2002) and alternatively "scientific TA" or "conventional TA" (Smits, Leyten & Den Hertog 1995) to participatory TA approaches (Joss & Bellucci 2002), which broaden the notion

of experts to stakeholders and/or lay people, further including questions of values, and being sensitive to the context in which the knowledge is being produced.

The post-positivistic character of TA knowledge is theoretically reflected in the initial PACITA proposal. Although acknowledging diversity in methods carried out across European TA organizations, the project's preference clearly goes to the participatory and communicative methods. Because the latter provides a more "socially robust" "knowledge-base", they are presented as "improvements" over the narrow scientific and "evidence-based" methods. The repertoire of "knowledge-based" instead of just "evidence-based" policy-making also reinforces the idea that TA is not only about universal science but also about values and politics and that these dimensions are inextricably interwoven in TA practice. Hence, the knowledge produced does not emanate from scientific experts only but also from policy-makers, various stakeholders or citizens. This positioning is grounded in references¹⁶⁰ to diagnoses sometimes labeled "mode 2 knowledge production" (Nowotny et al. 2001) or "reflexive modernization" (Beck et al. 1994), which acknowledge the normative and ethical dimensions of policy-relevant knowledge. However, our analysis of the PACITA example projects shows a slightly contrasted picture compared to those initial claims of the project¹⁶¹. The efforts toward the internationalization of the participatory methods (for instance, the world wide views method (Jorgensen et al. 2016) and the related claims of "encultured" and post-positivistic knowledge become increasingly subject to standardization. The latter comes with attempts at scientification, which requires standards of replicability or representativity (Voß & Amelung 2016) and ultimately reenacts a linear and separatist understanding between knowledge, society and policy-making.

In Wallonia, the TA project is fundamentally participatory in its initial conception. The former ministers in charge have expressed that the TA staff does not need to be composed of highly specialized scientists. In addition, the unit should not only provide scientific knowledge but also information of the public opinion and ways to act upon it, notably by stimulating public debate. When listing possible topics (for instance nanotechnologies, mobile phone antennas, privacy issues, ageing society, sustainable consumption, data-mining and cloud computing) the proponents highlighted their socially controversial nature, calling on the intrinsic value-laden character. In the TA working lunches it also became clear that some issues have very local dimensions and that TA projects and their results could not so easily and straightforwardly be

¹⁶⁰ See for instance the references of the section "about TA" on the PACITA website: <http://www.pacitaproject.eu/about/references/> (last accessed 25th of April 2017)

¹⁶¹ This is the reason why PACITA is pictured as a cloud in figure 13 below. The horizontality of the cloud represents the varying degrees to which knowledge is considered as encultured and post-positivistic and when it remains anchored in a more positivist and linear understanding.

transposed from one country to another, even if this idea remains present in some (minority) discourses.

In Portugal, the main rationale for Parliamentary TA is based on an evidence-based discourse. Accordingly, a TA unit should primarily provide scientific evidence for policy-makers to take better decisions, supposedly exempt from pre-established opinions or hidden agendas. Minor reserves are expressed with regard to uncertainty, differences in political use between national and international sources of knowledge, the politicization of expertise and the necessity to include citizens in the process. However, the inclusion of citizens is often put forward in a context of reconnecting the population with policy-makers rather than producing alternative expertise or knowledge that would be complementary to the one held by scientific experts. Furthermore, there are high expectations for foreign knowledge imports from other national TA organizations or alternatively dealing with some issues on the European or international level. These views of universally valid science reflect little sensitivity for the expression of local and “encultured” knowledge.

In the Czech Republic, the evidence-based discourse also prevails and scientific input should induce “better” policy-decisions. However, the scientific nature of prospective knowledge is questioned and presented as a difficulty to address policy-makers. Traditionally, the STRAST department performs desk research. With the broadening of the mission to TA, the notion of expertise gets slightly broadened to include some stakeholders. However, the kind of knowledge provided does not give as much attention to the risk dimensions and more generally the negative aspects of technology as this is perceived to be out of the expertise area of the TC. Citizen participation is regarded as difficult to organize and not particularly relevant in the Czech context. Despite some sensitivity to a more local approach to issue framing of TA projects, the roles of “knowledge sharer “ and “eyes opener” are mainly envisioned as a way forward for TA in the Czech Republic. Finally, this puts the issue of generic evidence and knowledge imports in the foreground.

Comparing the three national/regional case studies among each other, we can say in a nutshell that on the governance axis, Portugal is the closest to the single addressee, command and control conception of policy-making with its relatively strict focus on Parliament. Wallonia follows with more multi-level, multi-actors understanding of governance. However, the Parliament remains a central actor, not only symbolically but also in the different organizational dimensions of institutionalization. Finally, the Czech Republic endorses the multi-actor, multi-level governance to the fullest extent of our three case studies. On the knowledge axis, it is the Czech Republic, with its product approach of providing “evidence” for better policy-decisions and importing foreign knowledge that comes closest to the idea of universal, uncultured science. It is closely

followed by Portugal where the idea of knowledge imports is the most prominent. However, despite similar expectations of rational and “evidence-based policy-making” numerous actors stress the irreducible uncertainties and value dimensions of sociotechnical issues that cannot be solved with science alone. In Wallonia these uncertainties and value dimensions are even further reflected. From the outset, TA is not considered as a solely scientific activity and emphasis is put on public participation and stimulating societal debate.

Interpreting our findings (see Figure 14), we observe that the three case studies cluster around a common feature: the progression on the governance axis outweighs the evolution on the knowledge axis. The remakings of TA we observed are actually more concerned with meeting the requirements of multi-level, multi-actor governance than those of post-positivistic conceptions of knowledge (with the exception of Wallonia). The TA knowledge is conceived and produced in an evidence-based and generic way in order to serve a wide spectrum of actors and decision-making arenas. We propose to label this “evidence-based governance”.

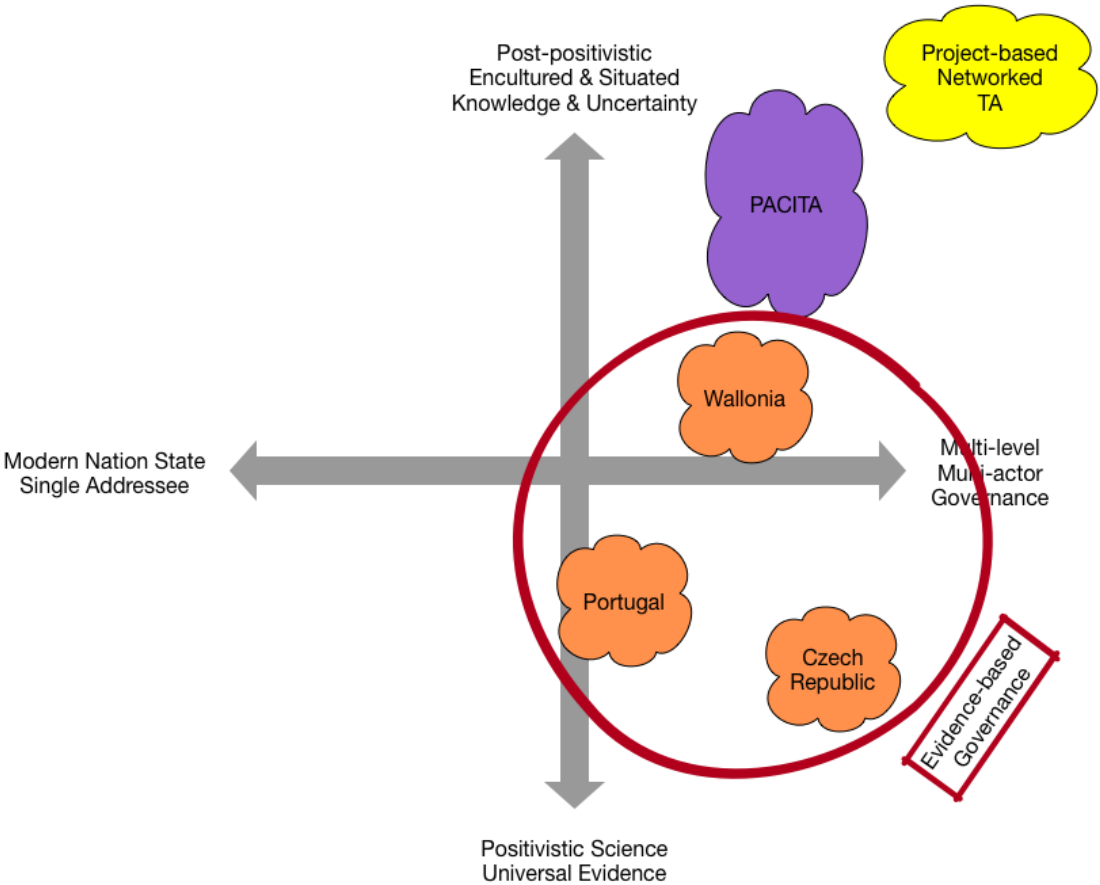


Figure 14: Placing the case studies, the PACITA project and the programmatic literature of project and networked TA non the policy-making - knowledge graph

These findings stay in relative contrast to both the initial PACITA objective and the propositions for networked and project-based models of TA. PACITA increasingly endorsed multi-level governance with the advancement of the project. It nevertheless remained attached to the idea of national, dedicated, specialized and single institutions. Furthermore, despite claims of post-positivist knowledge of the participatory methods used in PACITA, the example projects show signs of standardization, harmonization and scientification and tend to reproduce a linear and separatist view on the relations between knowledge, society and policy. There is also a striking contrast with the networked and project-based TA forms that we find in the literature, which pushed the ideas of opening up or reflexivity ever further. Those models are supposed to leave behind the idea of “glass and concrete” TA (Ely et al. 2014) or “TA of the last century” (as opposed to the 21st century model – cf. Sclove 2010). These forms of TA are supposed to even further endorse the multi-actor, multi-level approach of governance. On the knowledge side, there is a supposedly greater affinity with local knowledge, that is open to values and the inclusion of neglected views (Ely et al. 2014; Sclove 2010). However, in our case studies we see that the network model is mainly referred to for cost-saving and governance-related reasons rather than the particular knowledge claims of this model.

6. Transformation and expansion

The main normative objective pursued in the PACITA project was about extending the institutionalization of Parliamentary Technology Assessment in European countries that did not have such a capacity yet. In this way, PACITA was about remaking PTA in the sense of making more of the same elsewhere: under the patronage of PTA countries, non PTA countries were expected to benefit from a privileged venue for observing, copying and adapting institutional success stories to their own contexts and needs. This was supposed to be a win-win operation: on the one hand, TA was deemed intrinsically good for the European policy-makers and civil societies; on the other hand, having more TA institutions was expected to strengthen the embedding and legitimacy of TA institutions across Europe. However, as we have shown in our case studies, things did not happen according to the original plan as no new institutional creation of PTA was observed among the partner countries during the course of the project¹⁶². The PACITA project, through opening up the PTA concept to newcomers and making the objective of “expanding the TA landscape” increasingly flexible and open-ended, led to an alternative, unexpected remaking which affected the very ontology of Parliamentary

¹⁶² However, the EPTA network has continued to grow recently with new organizations joining as observers (Czech Republic, Lithuania, Slovakia to name but a few). Associate membership has recently been granted to the Russian Federation, Wallonia, Poland and Mexico. Most of these examples, however, are very recent and exceed the scope of this research.

Technology Assessment. As confirmed by new EPTA membership applications and a series of new associate memberships granted in the last years, TA has not run out of steam. It is just the way it is put forward and institutionally embedded that is likely to be changing.

So far, we have looked at the remakings at work under two main aspects. Firstly, the understanding and performance of institutionalization, which is not only organizational but also cognitive. It furthermore needs to be considered as a multifaceted and reversible process instead of a linear and dichotomist reality. The idea of a single, national, specialized and dedicated institution also faltered. Secondly, the knowledge-decision-making graph shows that the regional and national enactments of TA in our case studies contrast with both the PACITA objectives and the project-based and networked TA models of the recent literature. This crystallizes around the higher score on the decision-making axis compared to the knowledge axis.

At this point, it is illuminating for our analytical development to go a step further and ask a series of “why?” questions: *Why were there no new TA institutions created during or in the aftermath of the PACITA project? Why did the attempts at institutionalization encounter resistance in the countries analyzed? Why does the future of TA not play out equally on both the decision-making and knowledge axes?* Depending on how they are addressed, these “why” questions are likely to reinforce the deficit and evolutionary assumptions detailed above. Authors before us have tried to come up with answers to these “why” questions. Their efforts take the form of certain prerequisites or necessary conditions to be met in order for TA to be successfully implemented: Rip’s strategic science regimes (2002) in the case of Delvenne (2011); Jasanoff’s civic epistemologies (2005) for Hennen & Nierling (2014) or more generally “barriers and opportunities” (Hennen & Nierling 2013, 2014). While being very insightful, such research reflects a very ambitious “explicatory epistemology” (Colliot-Thélène 2004). In these analyses, TA is considered as a dependent variable of which we know a defined number of possible states and variations (institutionalized or not; different taxonomies of TA). The latter are affected by explanatory variables such as strategic science, civic epistemologies, forms of government etc. In such a context, thus, TA remains a relatively fixed reality.

Towards the end of the PACITA project, a TA manifesto was drafted and presented by the project’s coordinator at the second European TA conference in Berlin. In his formal address to the audience of this conference, the coordinator reviewed the achievements of PACITA in terms of expanding the TA landscape in Europe. In that sense, the PACITA management argues to have “planted seeds”¹⁶³ in the different partaking countries,

¹⁶³ See the concluding speech of the project’s coordinator at the PACITA conference in Berlin 2015: <https://slideslive.com/38893133/closing-session-and-farewell> (last accessed on November 19th 2016).

although no new institutions were created. The story still remains about growing and spreading TA to new countries, as it would just be a matter of getting there. The reasons for the limited success in installing new TA capacities in particular national or regional contexts were furthermore explained with cyclical and contextual elements. For instance, in our case studies, we found the conflict between the two Ministers in charge of the TA dossier in Wallonia presented as a (temporary) blockade - something quite contextual and related to Belgian federalist politics, which can possibly be overcome. In the Czech Republic the TA promoters say that it takes time to get Parliamentarians interested, but they are making little progress. Additionally, the first results have already taken roots by working for the Ministry. In Portugal it is often the financial crisis and budgetary austerity which are presented as the main obstacle to implement a fully-fledged TA unit in Parliament. Along the same lines, the newcomers often get words of encouragement from established TA staff stating that in their countries, the developments also took considerable time¹⁶⁴ and thus making parallels with their own institutional developments and reinforcing the feeling of a shared narrative about (the difficulties of) institutionalizing PTA. The same goes for the closure of IST and DBT. In the TA community, those events are primarily read as accidents of history stemming from adverse political circumstances. At no time, was there a reflection inside¹⁶⁵ the TA community about whether TA undergoes a more existential crisis.

All those explanations do not fundamentally challenge the rationale or ontology of TA. It is business as usual and basically more of the same that is promoted in this particular case. Instead we propose to shift our attention away from this explicatory epistemology and from the narrative of institutional deficit and focus instead on the **possible changes that affect TA** along this “expansion”. In this sense, we subscribe to a more interpretative epistemology of understanding rather than an explicative one. Hence, we therefore propose to shift from the “why” questions to interrogations about “what” is currently happening and “how” is it occurring? In particular, we aim to understand the current transformations TA undergoes, bringing the transformative dimensions of remakings to the fore. Hence, we aspire to make a sense of the unexpected findings of “evidence-based governance”.

Elements of this speak are also to be found in Nielsen & Klüver (2016).

¹⁶⁴ In Particular in Germany, where the creation of TAB took more than a decade, including majority changes and transitional forms of organization such as the Enquete Commission. In Austria it also took considerable time between the creation of the Institute of Technology Assessment at the Academy of Sciences in 1988 and the moment its relationship with Parliament became more formalized and it was granted full EPTA membership in 2013 (Nentwich 2016).

¹⁶⁵ For more “external” views, i.e. that are not directly linked with the interest at stake see Horst (2014) or Van Oudheusden (2013b).

7. Making sense of remakings: evidence-based governance and the new deficit of knowledge

What is actually changing in terms of the future(s) of TA? How is TA currently remade and with what effects? In this section we argue that the “evidence-based governance” is actually coherent with our observation of a shift from an institutional to a knowledge deficit. Indeed, if TA knowledge becomes universal and generic, it can be produced in one or a few locations and be taken up and used by a multitude of actors in different contexts. In other words, if decision-making becomes increasingly the prerogative of multi-level, multi-actor constellations, the knowledge needs to be suited to such multiple purposes. For this reason, it is conceived as an immutable evidence-based. The way this deficit is handled raises new questions and poses unsuspected challenges to the TA collective.

7.1. Political and epistemic subsidiarity

An overlooked dimension on the knowledge-decision-making graph is the issue of subsidiarity. Along the same analytical cut between knowledge and policy, we also propose here to separate political from epistemic subsidiarity. Political subsidiarity is a governance principle that seeks to respect national or regional autonomy and specificities by taking decisions at the lowest level of power possible while pursuing common goals with other polities. It is thus relevant to the multi-level, multi-actor governance described above. In contrast, the concept of epistemic subsidiarity as developed by Jasanoff (2013) is the way in which societies organize their modes of “*public reasoning*” in order to respect their “*communal sensibilities*” (Jasanoff 2013). In other words, epistemic subsidiarity “*respects ‘how’ (and not merely the ‘what’)*” (Jasanoff 2013: 136) of knowledge-for-action. “*Epistemic subsidiarity would in principle allow to subordinate segments of a polity, such as states in a federal union or nations in the international order, to hold on to their ways of knowing and their own collective knowledge on contested issues*” (Jasanoff 2014: 1747).

The author identified different modes of epistemic subsidiarity. Two of them are of particular interest for our argument. “Coexistence” represents a rather relativistic mode of epistemic subsidiarity where different knowledge and governance norms reside in parallel. None impedes on, nor dominates the other. Attention is given to the border management of those different regimes so they do not interfere with one another and are each left intact. Coexistence is about “*keeping things different*” (Doganova & Laurent 2016: 143). This regime builds on “*strict classifications, permitting no mixing*” (Jasanoff 2013: 138). Difficulties result when those boundaries are crossed and cannot be maintained, which is typically the case “*in a messy universe where nature, society and technologies [...] continually interpenetrate*” (Jasanoff 2013: 138). An alternative mode of

epistemic subsidiarity is “cosmopolitanism”. In order to understand this mode of epistemic subsidiarity, it is useful to distinguish first between cosmopolitan knowledge and cosmopolitan subsidiarity of knowledge. Cosmopolitan knowledge is generally described as universal and freed from local peculiarities, standing above national and cultural differences. *“Science [...] is taken by most of its practitioners to be unproblematically cosmopolitan, speaking the truths of nature in the same register, with equal force and conviction, to all people everywhere.” (Jasanoff 2011: 131).*

In the chapter 1 we have briefly described the linear and “separatist model” of science in society, departing objective and universal science from values and politics. Like the “magic bullet” metaphor (Hennen et al. 2004), science leads almost directly to the best policy decision. Problems arising in this process are always sought on the side of policy (and second in order), where all sorts of dynamics come to parasitize the linear uptake of unsullied science (in first order). Building on the example of skepticism towards climate change science, Jasanoff argues that “corruption” of the linear science-policy process is commonly sought in *“analyses grounded in international relations and negotiation theory [which] have not been able to account for the prevalence or persistence of climate skepticism in the United States” (Jasanoff 2011: 134).* To understand this phenomenon, the author proposes instead to look at the epistemic side of the problem, not just the political/governance level. With the help of the concept of “civic epistemologies” (2005) she highlights cultural differences in the knowledge generation process and how that knowledge gets accepted and taken for robust in a given polity. Civic epistemologies are generally defined as *“publicly accepted and procedurally sanctioned ways of testing and absorbing the epistemic basis for decisions making” (Jasanoff 2011: 8).* Despite global trends of globalization, convergence and harmonization of technological and political processes, these “civic epistemologies” differ considerably among modern Western nations. Taking this lesson seriously, *“the passage from technical assessment to the public sphere to policy choice is anything but linear, predictable, or deterministic” (Jasanoff 2011: 139-140).* Civic epistemologies concerned with *“credibility, accountability, and persuasiveness”* have an important role to play in *“ratifying”* knowledge for policy-making (Jasanoff 2011:139-140). Moreover, Jasanoff claims the necessity for *“stronger processes of mediation and translation woven into the processes of knowledge making itself” (Jasanoff 2011: 140).*

From there, the step to (cosmopolitan) epistemic subsidiarity is taken when these different civic epistemologies come in contact or need to coordinate. Hence the issue becomes of increasing importance in a world of *“world of connections, networks and flows” (Jasanoff 2013: 136)* – especially when the border management of the coexistence mode becomes increasingly difficult. Cosmopolitan epistemic subsidiarity implies a greater *“mutual recognition and acknowledgement” (Jasanoff 2013: 138)* of reasons and regulatory choices between different polities. The construction of this common world

requires reflection about what needs to remain divergent and “polity specific” and what can converge or be harmonized. In other words, it is concerned with the establishment of equivalences¹⁶⁶.

7.2. Political and epistemic subsidiarity in TA developments

Regarding the national and international developments of TA we analyzed, our results point at a shift from an epistemic subsidiarity marked by a mode of coexistence concerned with border management to a mode of cosmopolitanism concerned with creating equivalences (mainly between different domestic and foreign sources of knowledge). There are however different versions of, and challenges to this cosmopolitanism. Once rendered more explicit, the issues of cosmopolitan epistemic subsidiarity draw open a series of research avenues and lines of (self-)reflection for the European and international TA community, its practice and scholarship.

In the context of PTA, this issue of political subsidiarity can primarily be addressed via the fact that PTA institutions mainly act at the level of nation states and sometimes at the regional level, if there are STI competences delegated to these sub-stated entities. There are several scientific contributions (Vig & Paschen 2000, Delvenne 2011, Nielsen & Klüver 2016) on early discussions about TA at the European level, but the national level has remained the level where most PTA organizations are settled until today¹⁶⁷. In other words, “Europeanization”, transnational collaborations and projects do not replace the idea defended in the PACITA project and reiterated in the TA manifesto, which consists of having a TA office in every country. Therein, the coordinator states *“TA should be institutionalized in all European countries [...] The diversity in cultures and political contexts in Europe call for national implementation of TA in ways, which are optimal for the single nation”* (Klüver et al. 2016: 15). PACITA’s objective of “expanding the TA landscape” was initially understood as the very ambitious task of creating these national, specialized, single dedicated organization TA structures. However, due to its vagueness and flexibility, it progressively shifted to a multitude of ways to enact and further take up TA. In pursuing this objective in this particular way, the TA community has been very attentive to take into account these nation specific peculiarities in terms of institutional landscape, policy culture and so forth. On numerous occasions it was stressed that there was no best way to set up a TA organization and that each country/region had to find its own particular organizational arrangement that would fit its own context. Likewise, the main difficulties the local TA entrepreneurs encountered

¹⁶⁶ Equivalences are social practices that classify and establish what is like and unlike and how it ought to be treated accordingly. Equivalences are necessary for rendering assessments and scientific results more generally “freely transportable across political boundaries” (Jasanoff 2013: 139).

¹⁶⁷ Nonetheless, the European Parliament also features a TA Office, which serves policy-makers at the level of the European Union and is complementary to the activities carried out on different national levels.

were mostly understood in these political/governance terms. Leaving the concrete issue on how to institutionally organize a TA capacity to the appreciation and debate of local actors echoes with the political subsidiarity principle. In other words, the starting point for PTA development has basically been a regime of political and epistemic co-existence of different national PTA organizations on the one hand, and between PTA countries and countries or regions not having a formalized PTA infrastructure on the other hand. This is because each PTA organization produces its own policy-relevant knowledge for its own specific addressees and according to politically negotiated procedures that are estimated adequate in its respective polity.

Progressively, the (consciously sought) flexibility of “expanding the TA landscape” opened a new avenue for promoting TA. In the TA manifesto, a statement reads as follows: *“TA can through strong knowledge sharing and collaboration contribute to knowledge exchange and synergies, which provide for widespread use of the independent and knowledge-based advice from TA. **Countries should help each other by sharing TA knowledge and outcomes**”* (Klüver et al. 2016: 15 – our emphasis). Hennen et al. (2016) share the same idea, even if in slightly different terms: *“To further promote TA, one viable pathway would be continued collaboration – for example, **through starting TA projects together with experienced TA countries**”* (Hennen et al. 2016: 38 – our emphasis). In other words, in the normative conception of the PACITA project, the institutional deficit has given way to a more practical approach concerned with project collaborations and exchanges of practices and knowledge. Over the years, there has been a tradition of conducting TA projects across several countries, often sponsored by Framework Programs of the European Commission. In this tradition, there was a tacit consensus between the Science and Society directorate, the TA community and a series of STS scholars around the idea that TA was an instrument of Europeanization of Science Policy (MASIS 2009).

The objective of “expanding the TA landscape” coupled with the respect of this coexisting diversity in the PACITA project unsurprisingly led to an increase in diversity. Along this coupling came the necessity to grasp and take stock of these variations¹⁶⁸. Commenting on the TA manifesto, Böschen (2015) rightfully states that the diversification does not only concern the organizational models of TA, it also affects the TA *knowledge* itself. We argue that this diversification of TA knowledge and its related epistemic subsidiarity is currently a blind spot in TA practice and scholarship. With the challenges to the national and single organization model, the hybridization of the practice as well as the shift from an institutional to a knowledge deficit, the boundary management of the co-existence mode of epistemic subsidiarity became increasingly difficult. In the following paragraphs, we will highlight how through several dynamics,

¹⁶⁸ See Ganzevles et al. (2014) for possible future organizational forms and Hennen & Nierling (2014) for the different organizational strategies to promote TA in a wider range of countries.

cosmopolitanism gradually became an increasingly important mode of epistemic subsidiarity in this growing TA community. As Jasanoff (2013) notes, multiple modes of epistemic subsidiarity can co-exist within a given political territory. As we cannot say for sure that the project and networked forms of TA are yet (or will ever become) dominant, we cannot say either that this form of epistemic subsidiarity has become dominant. However, our point is that both changes align in a way that is critical for the future of Technology Assessment and raises a series of crucial research questions.

Two PACITA pilot projects as well as elements stemming from three case studies illustrate this point. The issue of the subsidiarity of knowledge emerges from both a bottom-up level (our case studies taken individually) and simultaneously from a top-down perspective (the PACITA project as supra-national incentive). Indeed, the results of our case studies show a preference for evidence-based governance and the transnational participatory exercises conducted as “example projects” in two PACITA work packages undergo a process of standardization. Both developments point to the creation of generic and “uncultured” knowledge, which is increasingly able to travel and be taken up in various decision-making arenas. At the bottom-up level in these two countries where the evidence-based discourse has proven to be dominant, we also find the strongest expectations towards imports of foreign TA knowledge for national policy-making. The most striking examples being the concept of the digital library in the Portuguese case and the identified functions of “eyes opener” and “knowledge sharer” (Hebakova et al. 2016:62) for the Czech Republic (and Central-Eastern European countries more broadly). The role of TA as “knowledge sharer” is envisioned as follows: *“There will always be a constant need for various examples of how one or another issue is solved in other countries. If Germany, Austria, the Netherlands or some other TA country can afford large-scale research on the impact of technologies developed in their countries on society in general – in the case of Eastern European countries and their budgetary constraints and undeveloped R&D systems – then adapting already existing EU knowledge into the local context might be a more feasible solution. That’s why cross-European cooperation of TA-like institutions is so important.”* (Hebakova et al. 2016: 62).

We also find a subtler version of this idea in Wallonia with the recurring concern to be able to participate in and profit from knowledge generated by European TA projects. In such view more equivalences are being created: between TA and other knowledge sources (such as foresight, evaluation, policy analysis, STS) and between foreign and national sources of TA knowledge. Depending on how “encultured” that foreign knowledge is, it can *ad minima* be an inspiration or learning experience and *ad maxima* constitute a quick and cheap way to find “evidence” and avoid so-called unnecessary duplication of TA work.

At the top-down level, the PACITA project may have contributed to raise some of the above-mentioned expectations, in particular that it is possible to produce generic knowledge that is valid and useful across all the partaking countries. The TA portal (developed under the PACITA project) aimed at aggregating an online repertoire of TA experts, projects, publications and other resources for the use of the international TA and policy-making communities. Furthermore, the way transnational project collaborations have been conducted may also have contributed to such a view on knowledge imports. Drawing on our analysis of two of the PACITA pilot projects (scenario workshop on ageing society and telecare ([Barland et al. 2016], and the European Wide Views on sustainable consumption [Jorgensen et al. 2016]) we can see how participatory methods got standardized and, at the same time, how they reproduced a linear, separatist and universal vision of knowledge. Local peculiarities were considered in an *ad-hoc* fashion and did not fundamentally challenge the common problem framing. Only citizens' opinions or stakeholders' visions were expected to vary from one country to the other and political decisions were left to the appreciation of the individual countries and partner organizations. However, this context sensitivity was designed distantly in time and space from the common and pre-established problem-framing.

The sketched developments at both the bottom-up and the top-down levels indicate that the PACITA community has gradually entered another form of subsidiarity, namely a cosmopolitan one. It is exemplified by a general positive attitude towards a greater intertwinement of knowledge stemming from different sources. The shift from a coexistence mode of epistemic subsidiarity to a cosmopolitan one accompanies the relative abandonment of creating new TA institutions to the advantage of fostering exchanges of practice and knowledge. Equivalences were created between TA and PTA, but also between TA and other forms of knowledge for decision-making and between foreign and domestic TA knowledge.

Organizationally, equivalences and exchanges are created between existing PTA organizations and the diversity of newcomers (or birth-enabler) organizations. In the analyzed pilot projects, they have come to play the role of TA knowledge provider for their respective addressees in policy making *as if they were TA organizations themselves*. This was so in spite of the fact that some actors may in fact represent specific interests (Sciences Academies, a particular university, or business interests) and thus may hardly claim a central overarching position as would for instance a single specialized, dedicated TA organization¹⁶⁹.

¹⁶⁹ See for instance how this issue has occupied the Rathenau Institute as being situated inside the Science Policy landscape as part of the Academy of Science (and thus a particular stakeholder) while on the other hand being commission to perform Science System Assessment on the whole research landscape (Ganzevles et al. 2012)

The consequences of this shift to a cosmopolitan mode of epistemic subsidiarity are far from anecdotal for the future developments of TA. The institutional deficit, i.e. the absence of specialized, dedicated, nationally bound, single TA organization was rooted in a subsidiarity mode of coexistence. Politically, it meant a juxtaposition of country specific TA institutions residing side by side in networks like EPTA. Epistemically, it meant that those national organizations were supposed to create knowledge that would fit the culturally embedded way in which knowledge is estimated appropriate for policy-making in their own particular contexts. The coexistence mode of subsidiarity of national/regional PTA institutions also included provisions to draw boundaries between TA and other practices as well as between “TA” and “PTA” more specifically. This “boundary management” has currently come under pressure. It is notably reflected in the inclusive attitude towards newcomers and the diversity (and opportunity) they represent. This inclusion culminates with the recurring idea to create an international TA association (Karapiperis 2010, Bütschi & Almeida 2016) with less strict membership rules than EPTA¹⁷⁰. Hence such an association would allow for a wider number of adherents, and thus allow for a greater diversity under the banner of TA. In addition, on the epistemic side, joint collaborative TA projects (or projects with TA partners institutions without a clear TA label) continue to be funded by the European Commission¹⁷¹, often with similar provisions for diversified consortia and/or the explicit aim to create convergences with neighboring practices (RRI projects in particular), as it was the case for PACITA, thus also encouraging the ongoing diversification of the TA collective.

8. Towards an alternative cosmopolitanism? Power and normativity in international TA collaborations

To summarize and conclude this discussion, we want to reflect on the implications of these shifts in subsidiarity and provide a few keystones for reflection and possible action in TA scholarship and practice. First, we want to dig deeper into the issue of

¹⁷⁰ EPTA rules for full membership are: operating within the scope of the Council of Europe; carry out “TA or related activities”; serving the Parliament; having a dedicated budget and organizational structure; having competence over science and technology matters; applying via formal written format. Other organizations, not living up to all these conditions can be associate partners such as GAO for not being part of the Council of Europe for instance. Associate members can participate in all EPTA meetings and activities but have no voting right in the EPTA council. Furthermore EPTA observers can also attend some activities. See <http://www.eptanetwork.org/about/about-epta/members-and-projects>, (last accessed November 19th 2016).

¹⁷¹ One can for instance mention the CIMULACT project, which features a high share of common partners with the PACITA project.

cosmopolitan subsidiarity¹⁷² and see what kind of challenges it poses with regard to power relations. We also ask how can be envisioned a cosmopolitan subsidiarity of knowledge that would nonetheless respect different civic epistemologies. Summing up the results of the whole project at PACITA's European TA conference in Berlin, at the beginning of 2015, the coordinator insisted on the mutual and bidirectional learning to stress that equivalences were created via flows of experience in both directions. The situation was presented to the audience as if everyone had learned equally from one another. However, the equivalences and mutual recognitions are rarely a zero sum game, as they potentially produce winners and losers¹⁷³. Indeed, epistemic subsidiarity is never politically neutral as it allocates power and responsibilities across national and supranational levels (Doganova & Laurent 2016; Jasanoff 2013). Above, we have shown that the scientific and political problem framing of the pilot projects occurred at the European level. The national or regional level is where citizens' or stakeholder' views come into play and are "expected to vary" (Doganova & Laurent 2016: 142). Accordingly, the valorization of the results and implementation of the generated knowledge was left to the appreciation of the different partners at the national level. Furthermore, as we have shown, in the PACITA project the initial framing in terms of institutional deficit was progressively replaced by a deficit in information and knowledge provision. Despite those transformations, the repartition of roles and power however remains the same. Instead of being an inspiration or blueprint for institutional creations, existing TA organizations become knowledge providers for smaller or less experienced actors in countries where such capacities do not exist. As Jasanoff rightfully states, one major issue in this kind of epistemic subsidiarity is the unequal power between actors. This becomes increasingly critical in the face of an often-heard argument stating: "*TA knowledge is already there*". Such an argument is habitually put forward to avoid the creation of new TA institutions or even dedicated resources to be spent on new TA knowledge. A drawback in the cosmopolitan regime is that "*conversations are unequal; power gets in the way of understanding*" (Jasanoff 2013: 138). While some see a great democratization potential in multi-level, multi-actor governance,

¹⁷² We choose to focus on this particular mode because of the original developments we have elaborated above. Other modes of epistemic subsidiarity can also potentially be explored for TA. A return to coexistence is one possibility that could be plausible with the current trends of European deconstruction in several countries of the European Union. Jasanoff mentions also constitutionalism as a third but yet only theoretical mode. It consists of defining a common overarching framework that spans over the local differences and defines reciprocities across different polities. Such constitutionalism could potentially be a working site for EPTA and give impetus for future collaborative projects between its members. It is also important to note that those three modes are not necessarily exhaustive but derive from empirical observations. Hence it is possible that in the future other empirical work will discover new regimes or modes of epistemic subsidiarity.

¹⁷³ The example put forward by Jasanoff is the asymmetry between the transfer of agrochemical industry technology from the US to India without in return a recognition of the innovative liability theories crafted by Indian lawyers representing victims of the Bhopal accident after the US justice declared itself non competent in the affair.

the issue of power is not necessarily equally distributed, nor has it vanished from the equation. The ideas of networks, projects, multi-level, multi-actor governance “*does not mean that there is horizontality, but instead that hierarchies are interconnected in complex networks, at multiple scales*” (Macnaghten 2015: 196). The risk is, indeed, that the recognition of mutual standards does not work in both ways and that the standards of more powerful actors may actually override those of less powerful ones. At the international level, the previously identified power asymmetries are thus reproduced: PTA and non-PTA countries and institutions become providers and recipients of knowledge, respectively. The first group has the power to determine the framing and scope of the knowledge produced and to package it with claims of universality and replicability, while the second group is supposed to welcome it and use it for local purposes.

Secondly, the previous point leads to considering the possibility to have a cosmopolitan subsidiarity which does not build on the linear, separatist conception of the science-policy relation but instead gives due respect to the different civic epistemologies¹⁷⁴ and encultured ways of public reasoning. Traditionally, it has often been participatory methods that have best lived up to such standards of encultured knowledge. Besides the tendencies to scientification and standardization of these methods, one also has to consider the very encultured nature of these methodologies themselves and how they emerged in particular national contexts and ideologies. The famous example here is the way in which consensus conferences actually rely on a cultural tradition of consensus seeking and challenging political and scientific authority in Denmark (Horst & Irwin 2010). Taking this idea seriously means not to impose such public ways of knowing and reasoning onto other cultural contexts. On the contrary to many normative writings and projects about public participation (to which PACITA is no exception), this would imply the possible recognition of civic epistemologies that do not build on a strong (or different) citizen involvement (in terms of representation, accountability or acceptance). In other words, a cosmopolitan epistemic subsidiarity which would avoid the linear and separatist science-society would require to revisit the often too dichotomist division between “expert TA”, “scientific TA” or “rational TA” on the one hand, and “participatory TA” or “deliberative TA” (Joss & Bellucci 2002), on the other. This does not only mean to place those epistemic practices on a continuum (Irwin 2008). It also requires looking

¹⁷⁴ Hennen & Nierling (2014) argue that those civic epistemologies as a suitable TA habitat are lacking in some of the studied countries. But what if they are just different and equally valid in their polities? The civic epistemologies have only been developed for very diverse three countries so far. The concept forged by the STAGE project actually looked into more countries and allowed for combinations of different models of S&T governance within a given polity. In that sense, it is perhaps a bit less culturalist. But more importantly it recognizes each country has a S&T governance style and does not replicate a more or less binary picture of having and non-having civic epistemologies and asking whether those are a condition for the successful implementation of TA.

into the “reflexive engagements”, i.e. local reconfigurations of participatory exercises (Voß and Amelung 2016). Those constitute possible sites of inquiry to further map the diverse ways of public reasoning. They may also open up the possibility of agency and appropriation for the new or less powerful actors, which participate in transnational collaborative projects.

Our last discussion point concerns the normativities in TA. This dimension is currently insufficiently reflected in the way TA makes community. In the face of the above-described diversification, we argue that it becomes necessary to explicit and clarify the values and normative commitments of TA. We have seen how the rationale of TA has changed overtime. With a focus on risk and early warning of negative consequences of new technologies grounded in post-material values of the 1970s and 1980s, TA has now become what Grunwald (2014: 19) calls “innovation TA”. Nowadays with the industrial transition, economic downturn and an amplified pressure on welfare systems, the rationale has increasingly become one of shaping, designing and diffusing acceptable and “needed” technology and creating innovation in socio-economically favorably conditions. Hennen and Nierling (2014) write about an “economy first” narrative surrounding current TA projects. Commenting on the increased diversification of TA, the authors (2014) raise questions as to whether some developments still conform to the understanding of TA – hinting the issue of possible quality control. Moreover, Bösch (2015) warns about the rise of possible technocratic versions of TA. He refers to the bridges that are currently built between Responsible Research and Innovation and TA (Von Schomberg 2012, Grunwald 2011). Some readings of RRI can potentially lead to an unconditional support of technological innovation in a neoliberal retreat of the State together with the adoption of procedures of “soft-governance” and “self-regulation” (Nielsen & Klüver 2016: 10-11). Other “evidence-based governance” developments run the risk of technocracy and circumventing the public or even the parliament when addressing issues of technological change. Some authors even suggested leaving the ideal of neutrality of TA behind and working for particular interests in line with the organizations’ constituency (Hebakova et al. 2016). Under that conception, TA would become (integrated into) a partisan, interest-based organization. Pushing the reflection further, we can connect with an increasing body of work, collaboration, exchanges and advice to countries that have, to put it diplomatically, other standards of democracy¹⁷⁵. This concerns collaborations of European TA actors with organizations from countries like China (Ladikas 2009, Ladikas et al. 2015), Russia (The Analytical Department of the Russian Council of the Federation became EPTA Associate member¹⁷⁶; see also Chernikova et al. 2015 for a more historical overview), a “Africa program” of the UK

¹⁷⁵ See for instance the performance on the democracy index produced by the Economist Intelligence Unit. <https://infographics.economist.com/2017/DemocracyIndex/> (accessed 30th of March 2017).

¹⁷⁶ <http://eptanetwork.org/members/associate-members/russia> (accessed 1st of April 2017)

Parliamentary Office of Science and Technology (POST)¹⁷⁷ in Kenya, Malawi and Uganda. Only the future will tell whether TA will become an instrument of neoliberalism, technocracy or worse, authoritarian regimes, or on the contrary if it will play a democratizing role in those countries. To what extent some technocratic features are actually part of a given civic epistemology is a similarly difficult question. To avoid total relativism, which could in the worst case legitimize authoritarianism as a valid civic epistemology, we see two interconnected challenges. A first one is to establish a non-ethnocentric definition of democracy that complements the call for a theory of TA (Grunwald 2010, TATuP 2007). This seems unavoidable since TA claims to *democratize* technological choices. Inevitably, this definition effort will simultaneously lead to normative questions requiring eliciting the values of TA and its positioning between the promotion and critique of sociotechnical futures (Lösch et al. 2016). Our point connects with previous pleas to reflect on the politics of TA (Delvenne et al. 2015) and/or Responsible Research and Innovation (Van Oudheusden 2014). As a community of practice oscillating between research practice, advisory function and shaping or modulating innovation trajectories (Lösch et al. 2016), the sole *“scientific consensus becomes one factor among many in the circulation of signs, symbols and meanings that bring collectives together”* (Jasanoff 2011: 3). Whether and how those signs, symbols, values and meanings converge or diverge rounds up this discussion with the same questions, which accompanied us so far. How will the TA community develop between diversification and harmonization, between non-interfering co-existence or the creation of equivalences, between specialization and multiple interconnected knowledge, between normative commitments and divergent rationales.

¹⁷⁷ <https://www.parliament.uk/mps-lords-and-offices/offices/bicameral/post/africa/> (accessed 1st of April 2017)

CONCLUSION - Networked and project-based Organizations, evidence-based governance and other trends under the cultural political economy of TA

1. TA is still a relevant practice and object of inquiry

Despite its rusty image, TA is still a relevant object of study and a practice worthwhile of investigation. Our research provided a number of original insights into the contemporary remakings of TA. However, the three national/regional case studies and the analysis of the PACITA project are not sufficient to conclusively answer all the questions regarding the future of TA: what organizational forms will emerge and prevail? Towards what kind of practices will TA evolve? How will the tension between convergence or specialization further unfold? How to make sense of the observed diversification and what course of action should be taken in order to build and maintain a community?

Departing from our empirical results and the irreducible uncertainties surrounding the TA developments in our case studies, we suggest some paths for further research. Extrapolating from there and building on some identified trends, we hint at ways to deepen the conceptual work undertaken in this thesis. By opening its scope to the broader perspective of a cultural political economy of TA, we suggest that the *network* organizational forms and their performance in terms *evidence-based governance* hold strong affinities with the new spirit of capitalism (Boltanski and Chiapello 2005) and neoliberalism more particularly.

The present thesis has provided the latest and most in-depth accounts of TA developments in Portugal, the Czech Republic and Wallonia. Concomitant with this analysis, TA developments also occurred in other countries, outside of the scope of our case studies, outside of the participating countries in the PACITA project and even outside of the European Union. To name but a few, countries like Mexico, Russia, and Japan have become EPTA observer members in recent years. South Korea (Kim 2012) and Australia (Stankiewicz & Lis 2015) have also witnessed considerable developments in the last years. Some of those developments resulted in formal outcomes such as organizational creations, dedicated resource affectation and associate EPTA membership. The latter thus live up to the identified dominant standards of specialized, dedicated, national-bound single organization. On top of that, there have also been a rising number of experiments in emerging countries and the global south. All this suggests that “*good old TA*” (Böhle & Moniz 2015) is still alive.

2. Remaking TA: Deep-seated continuities and other transformations

The concept of “remaking” has allowed for a nuanced account of the deep-seated continuities in the practice, institutionalization and international collaboration of Technology Assessment. The term captures the ongoing changes and uncertainties in organizational developments, within the practice of TA and the possible emergence of a new paradigm around the idea of “evidence-based governance”. We have extensively described the reproductive and transformative dimensions of remaking TA with our case studies and the PACITA chapter. Hereafter we will put those twofold dimensions in a broader social, historical and economic outlook.

In terms of reproduction of “good old TA” (Böhle & Moniz 2015), existing models continue to inspire new organizational creations and practices as recent new EPTA memberships attest¹⁷⁸. Moreover, we can also identify a deep-seated continuity between PACITA and earlier European projects aimed at fostering TA throughout the European Union. Indeed, as we have shown with our analysis of the PACITA project, the institutional deficit was progressively replaced by a deficit in information and knowledge provision for the newcomer partners and their countries/regions. Actually, this shift presents some surprising similarities with the EURETA (European Regions and TA) project conducted in the 1980s. When it came to evaluating the actions and impact of the project, the focus also shifted from organizational creations to experience sharing between partners across different countries. In addition, both projects showed a historical consistency in the way they conveyed the (evolutionary) discourse of “*we are almost getting there*”. It is indeed illuminating to look back on the conclusions drawn from the EURETA project: “*The EURETA initiatives had, at least implicitly, the objective of creating regional Technology Assessment institutions. [...] As the director of FAST [Forecasting and Assessment in Science and Technology] stressed it [...] institutionalization of regional TA could not be an objective in itself just because it was unrealizable at the level of a great number of European regions. More than the institutional aspects, [he] insisted on the need for transnational cooperation between local initiatives of Technology Assessment, of what nature whatsoever. In this sense, the EURETA results are not that negative as it created a favorable climate for Technology Assessment within the partners of the network and sparked to other regions*” (Valenduc & Vendramin 1993: 33, our translation). Both the efforts to revise the objectives pursued by the project’s partners as well as the experience of relative failure in institutionalizing TA show striking similarities with the PACITA project. Instead of being an inspiration or blueprint for institutional creations, existing TA organizations become knowledge providers for

¹⁷⁸ <http://www.eptanetwork.org/news/epta-news/25-event/91-eptal-2016-vienna> (last accessed 25h of April 2017)

smaller or less experienced actors in countries or regions where such capacities do not (yet) exist. At the international level, the previously identified power asymmetries are reproduced: PTA countries and institutions become providers and non-PTA countries recipients of TA knowledge.

But it is not like the developments we have been studying are just “old wine in new bottles” as some TA proponents and critics occasionally claim. Even the established TA organizations of the EPTA network are constantly evolving in their institutional embedding, organizational structures and performed practices¹⁷⁹. When it comes to the transformative character of remaking, we have laid the foundations for an approach taking into account the quantitative and qualitative diversification of TA. The quantitative transformation concerns substitutes to the idea of installing more single national TA organizations, which are specialized and solely dedicated to the practice of TA. Indeed, we find a nebula of international, networked, distributed capacities that are project-based and/or limited in time and which are not necessarily specialized practices of TA. The qualitative transformation concerns alternative pathways to the (simultaneous) evolution along the governance and knowledge axes – concretely an evolution towards participatory TA producing post-positivistic knowledge in multi-level, multi-actor governance settings. Empirically, we find that the evolution towards knowledge-based policy-making or knowledge-based governance has not occurred as predicted in the literature mobilized in the PACITA project. Instead, our case studies indicate a remaking of TA around the concept of *evidence-based governance*. Indeed, we identified an unequal move towards multi-actor, multi-level governance, which is not necessarily aligned with a post-positivist conception of knowledge.

3. Cultural political economy of TA

To better understand the affinities and complementarities of the project-based and networked forms of TA organizations as well as their performance in the interplay of conceptions of knowledge and of decision-making, we propose to place both phenomena in the framework of a changing cultural political economy (Tyfield 2012). In a nutshell, the cultural political economy (CPE) builds on cultural studies to understand the structural interplay of the economic, the political and the social (Jessop 2010). In other words, CPE takes the cultural turn into the more classical political economy approach, arguing that it will recreate a more coherent account of the social world. By giving equal attention to “*interrelated semiotic (cultural) and extra-semiotic (structural)*” dimensions,

¹⁷⁹ Just as a brief overview, we can mention a second department dedicated to Science System Assessment created in the Dutch Rathenau Institute; a stronger focus on Foresight within the working programs of both the STOA at the European Parliament and the TAB at the German Bundestag; a consolidation of the relationship with Parliament for the Austrian ITA, TA Swiss becoming a foundation in 2016.

CPE can enrich the twofold nature of remaking (reproduction and transformation) as simultaneously “*path-dependent path-shaping*” (Jessop 2010: 339-340). In this heuristic, there is no primacy of structural or cultural explanations over the other but rather, at times, a mutually reinforcing dynamic between both dimensions.

In the discussion chapter, we have seen how project leaders explained the relative failures to institutionalize TA mainly with contextual and cyclical explanations. Everything happens as if the goal was at an arm’s length or just about to be reached. It seems there is a lack of awareness for structural change of framework conditions and discourses that accompany contemporary TA development. In the Walloon case study, we have seen how the emergence (or discursive existence) of a possible fourth TA generation may preclude the institutionalization of an EPTA-like, participatory TA as a single, regional, dedicated and specialized TA organization. How come that some discourses, economic and political imaginaries take the lead over competing representations and get stabilized?

So far, we have accounted for the TA developments in terms of paradoxes, ambiguities or just diversification. In our case studies, project-based and networked organizational forms were not invested with post-positivist vision of knowledge in opposition to embracing multi-actor and multi-level conceptions of governance. The narrative of a simultaneous evolution on both dimensions does not reflect our empirical observations. Going a step further beyond the sole idea of diversification or the identification of paradoxes, we propose to see a bigger and more coherent picture of this remaking process. This is where the cultural political economy can help to reconcile the discourses about TA and more structural developments TA gets intertwined with.

We suggest that the sense-making behind the project-based and networked form of TA organizations not only matches the evidence-based governance, it also presents strong affinities with the structuring changes that have characterized the relations between the state, society and the economy for the last decades. On the one hand, project and networked organizational forms arguably emanate from what Boltanski & Chiapello (2005) have labeled the “new spirit of capitalism”. On the other hand, the evidence-based governance echoes the dominant neoliberal paradigm of capitalism in both its conception of knowledge and of public action. Taken together, we consider that the organizational forms, the semiotics underlying them and their performance seem coherent from a cultural political economy perspective.

3.1. The new spirit of capitalism

Let's start with what the cultural elements of the CPE of TA are. In our case, the project-based and networked forms of organizations are in opposition to what Ely et al. (2011) have called "glass and concrete" TA organizations, namely the single, specialized and dedicated national organizations that are found in the EPTA network. As we have observed, the networked and project-based TA are still emerging forms of TA and remain mainly in a proposition stage. However, as we have seen in Wallonia and Portugal, their discursive existence arguably prevents or slows down the enactments of the later forms of TA. To further support this claim, we need to delve into the cultural and moral repertoire of what Boltanski and Chiapello (2005) call the "new spirit of capitalism" (NSC). The two authors have studied the interrelated evolutions of capitalism and its critiques in the last decades through management discourses. In a Weberian tradition, Boltanski and Chiapello argue that capitalism in itself is amoral and needs a spirit to motivate people to engage with it. Such spirits have changed over time and the "network" and the "project" as particular patterns of social relations and organizational modes constitute the core reference of today's new spirit of capitalism. For the authors, the "connectionist world" or "projected city" constitute NSC's moral repertoire, which highly values authenticity, autonomy and creativity. The NSC stems from the recuperation of the artistic critique of capitalism that emerged with (new) social movements after 1968 and addressed the alienation of the post-WW2 fordist society. Over time, those critical values have become tamed and are now part of a new justification system that capitalism has successfully recuperated. In the 90s, the rise of NSC was accompanied by the stress put on innovation and new solutions, taking risks and valorizing personal attributes. Crucially, the projective, networked city values autonomy over security¹⁸⁰. It also produces new figures for the "great" and the "small" in a "connexionist world". The great in the projective city is someone who is mobile, able to mediate; a broker with no strings attached capable of navigating between different social worlds and networks. This justification system does not only help to morally sustain capitalism but the social order in general. By contrast, the dominated and weak both express their preferences; explain their behavior through the same justification schemes. The grammar of the project speaks both to capitalist and anticapitalistic critique. The described neocapitalism is not only concerned with the economy but more broadly different spheres of societal organization and activity¹⁸¹. Contemporary project

¹⁸⁰ Historically, the ideal-types of capitalist spirits with their varying degrees of security, autonomy and common good were: the paternalist bourgeois entrepreneur, followed by the big industrial enterprise with its director and managers and lastly multinationals in a globalized world surrounded by new technologies.

¹⁸¹ See for instance the "*social world of urban planners, architects, city administrators, green-tech firms and community movements*" (Blok 2013: 11), public engagement (Irwin et al. 2013) search engines (Mager 2013) or the interplay of Science Policy and STS and the performativity and uptake of analytical concepts such as the network (Garforth and Stöckelová 2012; Bonneuil and Joly 2013).

managers, artists or highly connected experts with accumulated project memory impersonate this stance as they hold strategic places in the network. Information (such as scientific knowledge) has high added value but experience is valued above technical expertise (which becomes obsolete at an increasingly fast rate). On the contrary, the symbolic system of the NSC does not reward social and professional immobility as well as organizational bureaucracy.

The network as organizational innovation spans above “old” categories, boundaries and distances (social, institutional, professional, geographic, national, etc.). In the moral repertoire of the NSC, structure, pre-assigned roles and positions are distrusted. *“Work methods are developed in line with constantly changing needs: people organize themselves and invent local rules that are not amenable to totalization and comprehensive rationalization by some putative organization department”* (Boltanski & Chiapello 2005: 135). The metaphors of connections and networks to qualify social relations and preferred organizational forms are ephemeral and rendered concrete or (re)activated through projects that are limited in time. The project is a temporary accumulation of value that appeals to the extension of one’s networks and calls for its own prolongation into further projects. Furthermore, the notions of “project” and “network” complete and reinforce each other. *“The project is a transient form that it is adjusted to a network world: by multiplying connections and proliferating links, the succession of projects has the effect of extending networks.”* (Boltanski and Chiapello 2005:111).

We can clearly see the affinities the NSC holds with some of the programmatic literature on networked and project-based TA. But more generally, it also touched upon its historical dynamic and evolution. TA’s roots also go back to the period of the artistic critique and new social movements that Boltanski & Chiapello describe around the 1960s and 1970s. Guston and Sarewitz even speak of a *“social movement for technology assessment [...] in the 1960s, [...] inscribed in the chartering legislation for the Office of Technology Assessment (OTA) of the US Congress.”* (2002: 96). Furthermore, the emergence of TA has been described as linked to environmental and other forms of civil society activism and so-called post-materialist values such as ecological concerns, citizen participation and personal freedom (Vig & Paschen 2000: 26). Later, participatory Technology Assessment has also been described as potentially critical of both political and scientific authority (Horst & Irwin 2010). However, over time, as Horst hypothesized concerning the Danish Board of Technology, TA and its critical potential¹⁸² may have become tamed and integrated into the “establishment” and “taken

¹⁸² Whether TA has ever been critical of technological developments and if it even represents one of its core assets is rarely addressed head on and seems to remain a matter of debate in academia since its early beginnings. It would require an additional effort and original historical method, including source criticism, which contrasts with the more recent accounts mobilized above. It is however useful to note that in the 1970s Wynne (1975) already highlighted the numerous political statements of OTA supporters that insisted on not

for granted” (2014: 45). We can draw parallels here between the dynamic of “recuperation” that Boltanski and Chiapello (2005) have described for artistic critique or Söderberg & Delfanti (2015) for the hacker activism and counterculture that was partially caught up by Silicon Valley capitalism. By various top-down attempts to “mainstream” it throughout European countries and beyond, as well as more bottom-up appropriations by increasingly diversified actors and interest, TA may have undergone a similar dynamic in terms of recuperation (or assimilation) of its critical potential.

Furthermore, we can see how in our case studies some of the attributes of NSC’s moral repertoire are valued in the way TA is developed. This is particularly striking when it comes to the interdisciplinary character of TA and to how practitioners and promoters are multiplying affiliations with different disciplines and communities of practice as well as strategically tapping into different *en vogue* policy discourses (Sustainable Development, Precautionary Principle, Responsible Research and Innovation, Grand Challenges, Inclusive Growth or Knowledge-Based Economy). Additionally we can mention the importance of project-managers, their abilities to build relational expertise and how communication¹⁸³ increasingly becomes an integral part of the TA practice.

The embracement of these connexionist values did not only come from the enthusiasm of actors alone. Following Willmott (2013), it is also necessary to look at more structural evolutions such as economic recessions and their austerity responses. To those deeper changes, the NSC (only) acts as a cultural lubricant, providing a moral repertoire for acceptance of and engagement in austerity policies. Willmott argues that those macro-economic developments made the aforementioned values a necessity rather than a virtue in itself. He stresses that the NSC “*highlights autonomy-expanding innovations in job and organizational structure as demonstrations of the recuperation of artistic critique. In doing so, Boltanski and Chiapello omit considerations of connections (or elective affinities, as Weber would say) between these innovations and politico-economic pressures to raise productivity of labor without significantly increasing the cost.*” (Willmott 2013: 113). Also, instead of Boltanski and Chiapello’s terms of neocapitalism, Willmott also prefers to speak of neoliberalism and draws out attention to the structural changes, placing the evolution depicted by Boltanski and Chiapello in the actual economic context marked by swindling public finances and austerity responses.

slowing down technological progress and more generally that TA would support consumerist and suburban lifestyle.

¹⁸³ See for instance the emphasis put on communication in the definition of TA within the PACITA project (Bütschi et al. 2004) and the stress put on communication in its training activities. Communication even becomes a specialized branch of the TA practice as for instance attests a communication department at the Dutch Rathenau Institute or the recent creation within the EPTA network of a subgroup of TA communicators.

In the first chapter we have addressed the consequences of neoliberal politics on the conception of public action with the concepts of new public management, new public governance (Politt & Bouckaert 2011) or the introduction of market principles in the functioning of the state, its institutions or its policies. In our case studies we can identify embryos of new business models of TA along disparate propositions such as membership contributions¹⁸⁴, private foundations carrying out missions of public service (such as DBT foundation), crowdfunding¹⁸⁵ TA projects or even more interest-based or partisan TA for particular clients or constituents (Hebakova et al. 2016: 60).

3.2. Evidence-based governance and neoliberalism

In the discussion chapter, we have seen how the performance of the above mentioned project-based and networked models of organizations contrasts with their claims in literature. The organizational forms hold strong acquaintances with the new spirit of capitalism and become increasingly prominent in a context of public resource shortages and austerity politics. Examining the evidence-based governance constellation more in details also reveals that it holds fundamental neoliberal traits about both the conception of public action and of the knowledge it conveys.

We propose to start by first considering the governance axis. It is generally accepted that the birth of TA took place in a context qualified as “technostatism” (Tyfield 2012) i.e. large-scale and publically funded research programs over which the state apparatus wanted to exert centralized command and control (Nielsen & Klüver 2016). Hence, TA was initially addressed at a “*single, clearly identified decision-maker*” (Bijker 2014: 25). Over the last decade, this conception of public decision-making has come under considerable pressure. As Tyfield puts it, “*Keynesian technostatism has never been definitively abandoned, and remains strongly present in the underlying design of post-war institutions, despite several decades of neoliberal(izing) reform. [...] Through the 1990s and 2000s, it was reformed by shifting from centralized national government to a discourse of distributed ‘governance’*” (Tyfield 2012: 155). We see here how with the embrace of multi-level and multi-actor governance, the power of the state gets undermined and decision-making power shifts to private actors or organizations. Furthermore, the functioning of the state institutions and public policies becomes increasingly organized according to market mechanisms. Key elements of neoliberal

¹⁸⁴ Mentioned in our Czech case study but also in the EPTA network and in the recurring idea of an international TA association.

¹⁸⁵ The DBT Foundation launched a crowdfunding campaign to raise funds for a TA project called « Global Say ». See <http://globalsay.org/the-tough-questions/> (accessed 15th of February 2017). Similar ideas were expressed during our interviews in Portugal.

policies such as concerns for cost-efficiency, public-private partnerships and other supposedly win-win arrangements are increasingly coming to the fore.

Secondly we want to consider the knowledge axis. The *evidence-based governance* constellation, we depicted on our graph conveys a neoliberal understanding in the sense that “*neoliberalism counsels a science policy that neutralizes (‘ill-informed’, ‘values-laden’) political debate by demanding ‘sound science’ to furnish the ‘facts’ [...] with the superior epistemology of science as itself a self-correcting marketplace of ideas guaranteeing the optimally-informed decision*” (Tyfield 2012: 157). The decontextualized and supposedly neutral and objective knowledge tends to downplay values and politics in technological choices. This is seen in many references to science providing the one best solution for policy-making as opposed to ideologically motivated decisions, which were often discredited by our interviewed TA proponents. Here, the thoughts of an “end of ideology” and the TINA (“there is no alternative”) rhetoric are never far away. Furthermore, objective, accessible and transparent information are considered prerequisites for the optimal functioning of markets. Political decision-making is considered in a similar way, where objective and neutral information leads to political decisions that maximize utility and minimize costs and negative impacts. A keyword is “*rational decision-making*” that relies on supposedly neutral and universal facts instead of recognizing their constructed character and that “*decisions are normative rather than rational*” (Bijker 2014: 25). Since scientific evidence is here considered as universal, value-free and standardized, it can be used in different contexts. This neoliberal understanding opens up possibilities to have economies of scale. Under this view, TA knowledge is possibly exportable and importable.

4. Extrapolating trends towards future challenges and research avenues

The previous analysis proposition in terms of cultural political economy actually opens up a new coherent framework in which project-based and networked TA organization align with evidence-based governance. Beyond supposed paradoxes or just plain diversification, it builds an alternative trajectory for TA that contrasts with the linear and evolutionary assumptions conveyed in literature and the PACITA project. At this stage we can also speculate about the future developments from here on. This means that we can build on the identified trends, test the evolutionary assumptions and explore alternative pathways to push our conceptual framework to its limits. In the last part of this conclusion, we will indicate possible avenues for future research by widening the practices and broadening the geographical scope our conceptual framework may be applied to.

The focus of this thesis was mainly restricted to parliamentary, or better, “policy-oriented TA” (Klüver et al. 2016). In the last decade, other TA and TA-like practices have proliferated. To name but a few of such approaches that operate TA-like functions, there are projects at the level of particular technological programs (ELSI & the human genome project, Anticipatory Governance concerning nanotechnology, [Barben et al. 2008]), design processes (Constructive Technology Assessment [Schot & Rip 1997]), laboratory practices (Socio-Technical Integration or Midstream Modulation, see Fischer et al. 2006, Fischer et al. 2010) or higher education curricula (Dusseldorp & Beecroft 2012 for an overview in German speaking countries; Greiving et al., forthcoming). In addition, some “lighter” forms of TA (using less resources) were also observed recently, for instance with the concept of “CTA lite” (see Greiving et al. forthcoming). With dominant public action paradigms such as New Public Management and New Public Governance, we can expect a continuing momentum for networked and project-based models - especially with the promises of de-bureaucratization and cost-savings. These evolutions may even be reinforced by particular understandings of e-governance or cyberscience (Nentwich & König 2012). Applied to TA, this trend of more distributed governance could result in an increasing uptake of on-line collaboration, cooperation and exchange up to the creation of virtual institutes, virtual research environments, and so on. Recent project calls¹⁸⁶ on the European level following-up on the PACITA call already point in such a direction.

All those proliferating practices point to a specialization trend according to institutional contexts, STI settings or particular socio-technical issues. Much of the above mentioned developments follow a trend in terms of specialization of these different fields of practice and research, such as, for instance, ethics of science and engineering, public engagement with science, technology management and innovation studies, governance research more broadly as well as social sciences and STS. On the other hand, in our case studies (the Czech Republic in particular, Portugal and Wallonia to a lesser extent) we observed quite the contrary. In these countries, TA developments are caught up in more encompassing practices of policy-advice in STI. The umbrella term of Responsible Research and Innovation (or RRI, see Grunwald 2014) pushed by the European Commission already tries to foster a greater integration and collaboration of those areas. The TA community also pays a lot of attention to this new concept and tries to define the perimeter of action where it may create synergies with RRI’s rationale and philosophies (Grunwald 2011, Klüver et al. 2016, Van Est et al. 2016, Von Schomberg 2011). In this sense, the questions of specialization of TA as a separate field of activity

¹⁸⁶<https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/issi-4-2015.html> (accessed 28th of March 2017).

vs. the convergence with other practices and possibly merging into broader more encompassing activity remains unresolved and uncertain. Perhaps, the question should be raised in different terms and on a less general level. The concept of epistemic subsidiarity (Jasanoff 2013), which we introduced in the discussion chapter, could be of additional help here. Indeed, it can be applied to the relation of different knowledge bodies across different scales of governance but it can also be useful to look at how particular bodies of knowledge interact in a same polity. We have seen how TA entrepreneurs need to strategically align with both more specialized practices as well as tap into umbrella terms such as RRI to pursue their agenda. In the face of greater integration such as promoted by RRI, when does policy-oriented TA co-exist with those more specialized practices and even neighboring practices and when are equivalences created (and even resonance or duplication avoided)? How do power relations between supposed equivalent practices play out in a more cosmopolitan mode of subsidiarity? How do specialized, fragmented and diversified TA practices perform with regard to umbrella concepts such as RRI compared to other policy informing practices? What place is left for local adaptations and how will the diversity of PTA, PTA-like and non-PTA actors be reflected in RRI? What does a particular mode of epistemic subsidiarity tell us in return about political subsidiarity and the more general issue of technology and democracy?

To further broaden out the possible implications of our research, let us consider the utility of our categorization of public action and knowledge. Besides the contrast between the evolutionary assumption of TA literature and the “evidence-based governance”, what other evolutions or extrapolation of trends can we expect and what additional research questions do they bare?

The policy-making axis is the first one we consider. On this axis and contrary to the knowledge axis, the promises and concretely observed realizations match relatively well. TA seems to grasp the multi-actor and multi-level conception of governance. What further evolutions can we foresee along this dimension and what may their implications be? These moves have to be accompanied by further critical research as they are not without effects on epistemic and social orders. We see three possible research avenues along the governance axis: determining the concrete (im)possibilities of cross-national TA collaborations; reinventing a conception of institutionalization that better captures project-based and networked forms of organization; and finally thinking governance outside of its neoliberal origins.

Firstly, much of the promises of increased collaborations are not yet empirically proven and the conditions of feasibility are still uncertain. This is particularly true for the supposedly cost-saving character and the promised economies of scale. More generally Van Est et al. (2016: 29) point to the fact that *“there is a clear lack of knowledge about*

how TA projects are set up in cross-national networks of organizations". Researching further whether the increased international, (on-line and off-line) collaborations will deliver on their promises will become crucial issues as international TA projects and cross-national knowledge transfers are expected to expand in the near future.

Secondly, the progression and possible generalization of project-based TA or the expansion of TA network with no fixed frontiers fundamentally challenges the actual definition of institutionalization. In terms of organizational dimensions, it goes against the idea of formalization by promoting ever moving and reconfiguring organizational forms. In the framework of inclusive modeling, it is problematic, as such project-based and networked organizational forms tend to abound and generalize on the project (micro) level. Subsequently, it becomes difficult to draw generalizable lessons on the organization (meso) and institutional (macro) level as those elements are either non-existent or constantly changing and evolving. Regarding the cognitive dimensions, networked TA also resists to the structuration of a community of practice or consolidation of a discipline. By relying on the connexionist world and valuing experience over expertise, promoting interdisciplinary work and topical mobility, project-based and networked TA hinder the accumulation, formalization and sharing of expertise among fellow practitioners. In that sense, studying the pervasion and institutionalization of networked and project-based organizational forms of TA in the future will require additional conceptual developments of institutionalization theory to accommodate for these generalized states of flux.

Thirdly, the vision and role of the state also needs to be redefined in the context of multi-level, multi-actor governance and possibilities for alternative to the neoliberal version explored above. In that sense, we join Bijker who advances that *"the state has to return from its neoliberal retreat of the past decades"* (2014: 26). He envisions a renewed role for the state, not a centralized and bureaucratic one as he defines the *"state' as a shorthand for a combination of the various public institutional arrangements that societies have created for their self-governance. These arrangements exist on all levels, local, regional, national and European."* (Bijker 2014: 26). Taking the argument further, one could hypothesize whether the networked and distributed character of TA is not revealing of broader and deeper transformation of the state and democracy. Forcing the traits, one could say that there is not one single and monolithic state, like some contemporary TA it is rather networked and distributed and based on a multitude of practices, instruments and organizational configurations.

We now turn to the knowledge dimensions of TA. Here the contrast is greater between the promises in the literature or the normative goals of PACITA and the enactments in its pilot projects or at the level of our case studies. In two of our case studies, the interest for public participation is relatively low. In addition, we have documented the attempts

of scaling up and standardization of participatory methodologies following a trend of “scientification” of the knowledge they produce. If we step out of the evolutionary and deficitary conception about public participation, two additional research questions emerge.

The first one concerns the public participation and its future. Terms such as “participation fatigue” (Cornwall 2008) and “post-public engagement” are starting to circulate. Besides a perceived decline or stagnation of participation there is a need to research why it has not taken roots in different countries. Recognizing that participation is both a culturally and politically framed practice (Horst & Irwin 2010, Hoppe & Grin 2000) would be a first step. In that sense different civic epistemologies (Jasanoff 2005) should not be regarded as a necessary condition for participation (Hennen & Nierling 2014) but rather as different patterns and many ways in which society is reflected and integrated in decision-making about scientific and technological choices. This issue will gain importance as the concept of TA continues to travel the world. The consequences are not only an increased diversification of the practice, they also feed information and back into the countries of origin and help learning how “encultured” some TA practices actually are. In a similar fashion, post-colonial literature has recently inspired a group of European and Brazilian scholars to look into the discourse and practice of R(R)I and found it “*interpretively flexible, culturally framed and politically entangled*” (Macnaghten et al. 2014: 193).

Secondly, what kind of knowledge is conveyed and produced in participatory TA methodologies? Initial claims and references to post-normal science (Funtowitz and Ravetz 1993), mode 2 knowledge production (Nowotny et al. 2001) or “knowledge-based” instead of “evidence-based” input for decision-making were not necessarily taken up in our fieldwork. Furthermore, we have described a discrepancy between the initial and official PACITA discourse and the concrete enactments in pilot project, which did not exactly perform accordingly. More generally, much of international TA exercises - those that suit the project-based and networked organization and the neoliberal cost-saving logics - are stuck in a phase of standardization and specialization. The knowledge generated thus equates more the uncultured, positivistic conception of knowledge. However, Voß & Amelung (2016) leave the door open for possible “reflexive engagements”, i.e. local contestation of the terms of engagement and creative and innovative reappropriations of participatory methods. The issue of reappropriation does not only concern the methods themselves but also the knowledge produced and more particularly how it is received when it travels to other contexts. Indeed, development and post-colonial studies show that knowledge is never only passively absorbed but always actively appropriated and transformed. The post-colonial scholarship has emphasized the active role of appropriation (Simões et al. 2013) of foreign knowledge rather than merely its straightforward and passive transfer. The latter is rather

recuperated, translated, altered and put to reuse in unforeseen ways. We would encourage follow-up research in this direction, especially looking into the (collaborative or not) creation and local appropriation of such supposedly cosmopolitan knowledge in different settings. It would require to take into account a certain agency of the “peripheral” actors without turning a blind eye to the unavoidable power relations and resources asymmetries of the cosmopolitan epistemic subsidiarity.

Another possible extrapolation of the trends highlighted in this PhD thesis concern the innovation paradigm TA evolves in. Flagship R&D programs and other “*large-scale research and innovation efforts accompanied by centralized social engineering*” (Nielsen & Klüver 2016: 2) have co-produced the first TA generation. Today, we may witness the emergence of a new innovation paradigm and possibly new rationales and functions for TA that accompany this paradigm. Such a move can seek theoretical inspiration from the way that different waves of TA mediated the shifts and reinvented themselves between succeeding generations of innovation policy (Van Oudheusden et al. 2015). But those shifts in innovation policies also redefine TA’s role vis-à-vis other knowledge producing actors. For instance, Van der Druin et al. (2014) argue that while TA was prominent during a “market pull” model of innovation policy, the supposedly latest systematic innovation or innovation networks paradigm is more in line with what they call “networked foresight”. While there is certainly more than just one approach of TA and while the differences between TA and foresight are not always so clear-cut, the idea of different practices and disciplines of sociotechnical futures research competing with one another is certainly worth studying.

What would such a new innovation paradigm look like? Along a few of the variations mentioned to the practice of TA above and the arguable pervasion of the connexionist word in STI governance, there is an even wider area of practice that could be labeled “bottom-up innovation”. This intuition emanates from our case study in Wallonia. Here TA developments are sometimes put in relation to public policies aiming to foster creativity. Also besides the development of TA in the Parliament, there is an ongoing work of TA activities, which are not necessarily policy-oriented on the micro level of projects. More generally, there is a large international movement that so far has not gained much attention among TA scholarship. Bottom-up innovation is very heterogeneous, loosely defined and includes particular arrangements of organizations and methods such as maker- and hackerspaces, DIY biology, citizen science, Living Labs, FabLabs, etc. Among the attempts to categorize those approaches we find taxonomies such as social innovation (de Schutter 2014), peer production (O’Neil 2012) or third spaces (Burret 2013). For the sake of simplicity, we refer to them as “bottom-up innovation approaches”. Just like the project-based and networked TA forms, they hold similar normative ambiguities. Some analysts primarily see their emancipation potential, notably in transition management (De Schutter 2014), while other focus on

recuperation of counter cultures (Söderberg & Delfanti 2015) in silicon-valley capitalism and study new forms of domination and alienation (O'Neil 2013). The functions TA may fulfill in such a new paradigm have yet to be explored. The conditions under which the TA rationale is scalable to adapt to such micro-level and multi-sited innovation approaches is also still to be researched and practically experimented.

Moreover, this emergent bottom-up innovation paradigm also needs to be further characterized with regard to its conception of governance and knowledge. Within the changing cultural political economy described above, those bottom-up forms of innovation may become more prevalent in the future. They indeed embrace the distributed character of governance, the flexible organizational forms of the artistic counter-culture or equally the new spirit of capitalism. Giving away its role of steering STI policy, the state endorses the role of a facilitator of social experimentation (De Schutter 2014). As first analyses suggest, the role of participation and knowledge generation also changes drastically in such settings (Roskamp et al. 2016). Not only is the societal or public sphere constructed as a succession of “mini-publics” that engage with the innovation endeavor mainly as “co-creators” or “users”. It is also that criteria important to participatory TA, such as demographic representativity or a plurality of citizens’ views, become obsolete and replaced by voluntary participation of socioeconomically more homogeneous users or members of an innovation collective. There also seems to be a relative discrepancy between the claims and actual level of involvement of users in such settings (cf. Vanmeerbeek et al. 2015 regarding the particular issue of Living Labs in Europe). As decision-making becomes merely a design issue at a relatively low level of distributed governance, the kind of knowledge produced and its purpose also changes. The legitimacy of participation (Turnhout et al, 2015) arguably rests on the quality and quantity of outputs and how they instrumentally serve particular innovations. Rationales such as “early warning” (Guston & Sarewitz 2002, Grunwald 2014), “social learning” (Rip 1986) or “anticipation of sociotechnical futures” (Goorden et al. 2008) may be replaced by more instrumental, “solutionist” or “technological fix” approaches.

5. Completing the insertion cycle and moving back in?

This conclusion ends on a series of new research avenues for scholars interested in the development of Technology Assessment and related practices. Along with the discussion chapter, this conclusion also sketched out some recommendations for the TA community and advised it to make explicit some normative and democratic conceptions that are underlying different strands of the TA practice. For us this means having arrived at the ultimate stage of the insertion methodology, namely the “moving out” of the field so to be able to independently generate insightful knowledge about the practice and

community that was explored. At this stage comes up the question of moving back in or at least continue to be around. This moment coincides with a renewed interest in the Walloon Parliament for TA. A process we can now advise with slightly more inside knowledge. But it is now also time to communicate back some of the findings to the TA community, not only to validate the findings and analysis but to trigger a critical but constructive discussion about the findings and how they may improve the practice. At this point we give a third meaning to the concept of remaking. After the meanings of reproduction and the transformation that crisscrossed the whole thesis, it now comes to the improvement of TA. Following Chilvers and Kearnes (2015) this third meaning of remaking refers to the improvement and to *“open up new possibilities of its remaking”* (2015: xiv) as opposed to “unmakings” we have recently witnessed for IST and DBT, for instance.

This is not only a call for more theory of TA (TATuP 2007) and its underlying conception of democracy, technology, the state and the economy. Inevitably, this definition effort will simultaneously lead to normative questions TA practitioners ought to address. As a community of practice oscillating between research and practice, advisory function and shaping or modulating innovation trajectories (Lösch et al. 2016), the sole *“scientific consensus becomes one factor among many in the circulation of signs, symbols and meanings that bring collectives together”* (Jasanoff 2011: 3). Engaging in this reflection could actually constitute a crucial exercise of community building, especially in the context of growth and diversification of this collective. If one takes the recent closures of IST and DBT seriously and places them in a possibly broader crisis of TA, it may even touch upon crucial learning processes in which the survival of TA is possibly at stake. Lastly, based on our personal experience, we argue that such an endeavor cannot only be resolved in a detached and theoretical way. Drawing on the heuristic value of insertion and the way it helped us to explicit some normative dimensions of the PACITA project, we cannot stress enough the importance of face-to-face encounters and veritable in-depth exchanges between practitioners across organizations and countries. It remains a privileged way to continue to address the futures of TA in the remaking. The emerging forms of virtual collaborations around transnational Technology Assessment exercises will require methodological innovations for social scientists to keep up with and take stock of these evolutions.

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1. List of Abbreviations

ADAPTA - Assessing Debate and Participatory Technology Assessment Project
AdI - Innovation Agency, Portugal
AdN - Numeric Agency, Wallonia
AEI - Agency of Enterprise and Innovation, Wallonia
ARES - Academy of Research and Higher Education, Wallonia-Brussels Federation
ASCR - Czech Academy of Sciences
ASE - Agency for Economic Stimulation, Wallonia
AST - Agency for Technological Stimulation, Wallonia
CECC - Commission for Education, Science and Culture, Portugal
CES - Centre for Social Studies, University of Coimbra, Portugal
CESES - Centre for Social and Economic Strategies, Czech Republic
CES.NOVA - Centre for Sociological Studies, Universidade Nova de Lisboa, Portugal
CES(R)W - Walloon Economic and Social Council
CIES - Center for Research and Studies in Sociology, Portugal
CIMULACT - Citizen and Multi-Actor Consultation on Horizon 2020 Project
CISC.NOVA - Interdisciplinary Centre of Social Science, Universidade Nova de Lisboa
CITA - Interdisciplinary Unit for Technology Assessment, Wallonia
CPE - Cultural Political Economy
CPS - Council for Science Policy, Wallonia
CR - Czech Republic
CRDI - Council for Research, Development and Innovation, Czech Republic
CRIDS - Research Center Informatics, Law and Society, Wallonia
CRISP - Socio-Political Information and Research Center, Belgium
CTA - Constructive Technology Assessment
CTU - Czech Technical University
CUEC - Charles University Environment Centre, Czech Republic
DBT - Danish Board of Technology (Foundation)
DGO6 - Directorate for Technologies, Research and Energy, Wallonia
DPR - Regional Policy Declaration, Wallonia
EA - European Academy of Technology and Innovation Assessment, Germany
EC - European Commission
ECAST - *Expert and Citizen Assessment of Science and Technology Network*
EHS - Environmental, Health and Safety Aspects
EIA - Environmental Impact Assessment

ELSI - Ethical, Legal and Social Implications
 EMERIT - Experiences of Mediation and Evaluation of Research and Technological Innovation
 EPTA – European Parliamentary Technology Assessment Network
 ETAC - European Technology Assessment Communicators
 ETAG – European Technology Assessment Group
 ETAN- European Technology Assessment Network
 ETEPS - European Techno-Economic Policy Support Network
 EU – European Union
 EUDEB - European Debates on Biotechnology Project
 EURETA - European Network Technology Assessment and Region
 EUROPTA - European Participatory Technology Assessment
 EWV - Europe Wide Views
 DCSA- Department of Applied Social Sciences, Universidade Nova de Lisboa, Portugal
 DEEPEN – Deepening Ethical Engagement and Participation in Emerging Nanotechnologies Project
 FAST - Forecasting and Assessment in Science and Technology
 FCT - Foundation for Science and Technology, Portugal
 FEPASC - Portuguese federation of Scientific associations and societies
 FP7 - 7th EU Framework Programme for Research and Innovation
 F.R.S/FNRS - Fund for Scientific Research, Wallonia-Brussels Federation
 FTU - Foundation University and Work, Wallonia
 GA CR – Czech Science Foundation
 GAO - Government Accountability Office, United States
 GDP - Gross Domestic Product
 GrEAT - Study Group on Technology Assessment, Portugal
 H2020 – Horizon 2020 EU Framework Programme for Research and Innovation
 HTA – Health Technology Assessment
 ICT – Information and Communication Technologies
 IET - Enterprise and Work Innovation Studies Journal
 IN+ - Center for innovation, Technology and Policy Research, Portugal
 INES - The Institutionalization of Ethics in Science Policy Project
 INFARMED - National Authority of Medicines and Health Products, Portugal
 ISCTE - University Institute of Lisbon, Portugal
 ITAS/KIT - Institute of Technology Assessment and Systems Analysis, Karlsruhe Institute of Technology, Germany
 ITQB - Technical Institute of Chemistry and Biology, Portugal
 IWEPS - Walloon Institute for Evaluation, Foresight and Statistics
 JNICT - National Board for Scientific and Technological Research, Portugal
 KBE – Knowledge-Based Economy
 KEF – Knowledge Economy Forum, Lithuania

MASIS - Monitoring Activities in Science in Society
 MCE - Ministry for Science and Education, Portugal
 MEE- Ministry of Economy and Employment
 MEYS - Ministry of Youth, Education and Sports, Czech Republic
 MIT - Ministry of Industry and Trade, Czech Republic
 MMLAP - Mobilization and Mutual Learning Action Plan
 MP – Member of Parliament
 NCP – National Contact Point
 NGO – Non-Governmental Organization
 NPG – New Public Governance
 NPM – New Public Management
 NSC – New Spirit of Capitalism
 NTA – (German-speaking) Network of Technology Assessment
 OPECST - Parliamentary Office for the Evaluation of Scientific and Technological Choices, France
 OAT – Observatory of Technology Assessment, Portugal
 OECD - Organisation for Economic Co-operation and Development
 OTA – Office of Technology Assessment, United States
 PACITA – Parliament and Civil Society in Technology Assessment Project
 PDAT - Doctoral Program on Technology Assessment, Portugal
 PDEPP - PhD Program on Engineering and Public Policy, Portugal
 PER – Public Engagement in Research
 PES(T) – Public Engagement in Science (and Technology)
 PhD – Doctoral degree
 PIAS - Prague Institute of Advanced Studies, Czech Republic
 POST - Parliamentary Office of Science and Technology, United Kingdom
 PTA – Parliamentary Technology Assessment
 pTA – Participatory Technology Assessment
 PUBACC - Public Accountability Procedures in Contemporary European Contexts Project
 PUS(T) – Public Understanding of Science (and Technology)
 R&D – Research & Development
 RIA – Regulatory Impact Assessment
 RRI – Responsible Research and Innovation
 SiS – Science in Society
 SME – Small & Medium Enterprises
 SPEAR - Support of the Evaluation Activities of R&D Programmes
 SPIRAL – Research Centre at University of Liège, Wallonia
 S&S – Science and Society
 S&T – Science & Technology
 STAGE - Science, Technology and Governance in Europe Project
 STI – Science, Technology and Innovation

STOA - Science and Technology Options Assessment, European Parliament
STS – Science, Technology (in Society) Studies
STSS - Centre on Studies of Science and Technology on Society, Czech Republic
STRAST - Department of Strategic Studies, Technology Centre, Czech Republic
STRATA – Strategic Analysis of Specific Political/Policy Issues Project
STV – Flemish Foundation for Technology Assessment
SWAFS – Science with and for Society
TA – Technology Assessment
TAB - Office of Technology Assessment at the German Bundestag
TA CR – Czech Technology Agency
TAMI – Technology Assessment, Methods and Impacts Project
TATuP – Journal for Technology Assessment in Theory and Practice
TC – Technology Centre, Czech Republic
TSEAR - Targeted Socio-Economic Research
UK – United Kingdom
UNL – Universidade Nova de Lisboa, Portugal
US(A) – Unites States of America
UTAO - Technical Unit of Budgetary Support, Portugal
UNIDO – United Nations Industrial Development Organization
UTS - Unit Technologies and Society, CRIDS, Wallonia
VATES - Science-policy research to improve the quality of strategic decision-making in research projet, Czech Republic
VIWTA - Flemish Institute for Scientific and Technological Aspect Research
WBI – Wallonia-Brussels International
WWV – World Wide Views

2. List of Interviewees¹⁸⁷

2.1. Wallonia

- Henri Monceau (11.02.2012) Head of Cabinet of the Minister for Economy and New Technologies
- Marie-Carmen Bex (14.02.2012) Head of Cabinet of the Minister for Research and Science Policy
- Gian-Marco Rignanese (14.02.2012) Scientific Expert for the Cabinet of the Minister for Research and Science Policy
- Véronique Cabiaux (18.02.2012) Director of the Walloon Agency for Technological Stimulation
- Daniel Collet (16.05.2012) Inspector General of the Department of Competitiveness and Innovation
- Pierre Wolper (21.05.2012) Vice Rector of Research, University of Liège
- Gianni Infanti (11.06.2012) President of the Walloon Council for Science Policy and Representative of the Socialist labor union at the CESRW
- Dominique Graitson (11.06.2012) Secretary of the Walloon Council for Science Policy
- Fabienne Dideberg (11.06.2012) Secretary of the Walloon Council for Science Policy
- Joëlle Kapompolé (31.05.2012) Member of the Walloon Parliament, Socialist Party
- Claire Lobet (31.05.2012) Director of Cellule Interfacultaire de Technology Assessment, Université de Namur
- Paul Berckmans (31.05.2012) Flemish Economic and Social Council and former Flemish Foundation for Technology Assessment
- Sébastien Brunet (31.05.2012) General Administrator of the Walloon Institute for Evaluation, Prospective and Statistics
- Pierre Delvenne (13.04.2014) Vice Director of SPIRAL Research Center, University of Liège

¹⁸⁷ If not otherwise specified, the positions held are those at the time of the interview.

2.2. Portugal

- Antonio Brandão Moniz (08.04.2014): Professor at PDAT, Director of IET (enterprise and work innovation research center) FCT-UNL and visiting researcher at ITAS-KIT. Founder of PDAT and GrEAT
- Mara Almeida (16.04.2014) PhD in Biology. PACITA National Project Manager at ITQB
- Mario Farelo (23.04.2014) Professor in the Department of Applied Social Sciences, FCT-UNL and PhD student at PDAT.
- Bernardina Gonçalves (06.05.2014) PhD student at PDAT
- Isabel Marques Rosa (06.05.2014) PhD student at PDAT
- Nuno Boavida (07.05.2014) PhD student at PDAT. Scientific staff at ITAS-KIT. Coordinator of Indicators Working Group at GrEAT.
- Miguel Carvalho (08.05.2014) PhD student at PDAT. Executive Director MIT-Portugal Program IST
- Maria Isabel Gomes (13.05.14) Professor at PDAT
- Nelson Chibeles Martims (13.05.2014) Professor at PDAT
- Maria Paula Diogo (14.05.2014) Professor, Head of the Department of Applied Social Sciences, FCT-UNL, Head of the Interuniversity Centre for the History of Science and Technology (CIUHCT)-Unit NOVA
- João Caraça (23.05.2014): Professor *Instituto Superior de Economia e Gestão (ISEG), University of Lisbon* and Director of the Paris Delegation of Fundação Calouste Gulbenkian
- Maria Isilda Aguincha (28.05.2014) Member of the Portuguese Parliament, Standing Commission on Education, Science and Culture. PSD (Social Democratic Party)
- Gabriela de Sena (28.05.2014) Member of the Portuguese Parliament, Standing Commission on Education, Science and Culture. PSD (Social Democratic Party)
- Maria João Maia (29.05.2014) PhD student at PDAT. Scientific staff at ITAS-KIT. Coordinator of Health TA Working Group at GrEAT
- Rui Pedro Duarte (30.05.2014) Member of the Portuguese Parliament, Standing Commission on Education, Science and Culture. Rapporteur for Technology Assessment.
- Manuel Heitor (03.06.2014) Professor at Instituto Superior Técnico, IST and director of IN+, the Center for Innovation, Technology and Policy Research at IST. Former Secretary of State for Science, Technology and Higher Education within the Portuguese Government
- Vitor Corado Simões (03.06.2014) Professor at ISEG-UL
- Tome Canas (05.06.2014) PhD student at PDAT. Director of Research and Innovation at Brisa Inovação
- Cristina Souza (06/06/14) Professor at PDAT and ISCTE-IUL

- Luis Fazenda (11.06.2014) Member of the Portuguese Parliament, Standing Commission on Education, Science and Culture. BE (Left Bloc).
- Susana Martins Moretto (12.05.2014) Lecturer at SEM-Tongji University, Shanghai and PhD student at PDAT. Coordinator of Transport/Mobility Working Group at GrEAT.
- João Arriscado Nunes (12.06.2014) Professor at School of Economics, Centro de Estudos Sociais, University of Coimbra
- Tiago Santos Pereira (12.06.2014) Researcher and Executive Director of Centro de Estudos Sociais, University of Coimbra.

2.3. Czech Republic

- Michal Pazour (08.09.2014) Head of Strategic Studies Department (STRAST) in the Technology Center (TC)
- Jan Romportl (11.09.2014) Department of cCybernetics & Department of Interdisciplinary Activities. University of West Bohemia
- Ondřej Pokorný (12.09.2014) Deputy Head of Strategic Studies Department (STRAST) in the Technology Center (TC)
- Vladimír Rogalewicz (15.09.2014) Czech HTA, Faculty of Biomedical Engineering, Czech Technical University in Prague.
- Tomáš Ratinger (15.09.2014) Strategic Studies Department (STRAST) in the Technology Center (TC)
- Kristýna Meislová (17.09.2014) Strategic Studies Department (STRAST) in the Technology Center (TC)
- Ivan Dvorak (18.09.2014) Innovation Leadership Agency
- Eva Sebroňová (23.09.2014) National Information Centre on European Research in the Technology Center
- Daniela Váchová (23.09.2014) Head of Department of Business Development in the Technology Center
- David Marek (24.09.2014) Strategic Studies Department (STRAST) in the Technology Center (TC)
- Miroslav Kostić (24.09.2014) Strategic Studies Department (STRAST) in the Technology Center (TC)
- Zeno Veselik (25.09.2014) ABC Works (Advisory and Business Consulting)
- Lenka Hebáková (26.09.2014) Strategic Studies Department (STRAST) in the Technology Center (TC)
- Petr Machleidt (29.09.2014) CSTSS at the Philosophical Institute of the Academy of Science.
- Karel Mracek (29.09.2014) ex-CSTS and now Applied Research Association (AVO)
- Rut Bízková (only transcripts) Technology Agency, Former Minister of the Environment

3. List and brief description of PACITA partner organizations

DBT: The Danish Board of Technology¹⁸⁸ was the project coordinator. DBT is an iconic TA institution, famous for the development of citizen consensus conferences on issues of Science and Technology and international leadership in transnational TA exercises (such as the world wide views methodology). DBT presents itself as a international “forerunner” in policy-relevant citizen consultations. In 2012, it became the Danish Board of Technology Foundation, a private, non-profit organization.

ITAS: The Institute for Technology Assessment and System’s Analysis¹⁸⁹ is located at the German Karlsruhe Institute of Technology (KIT). Since the Instalment of the Technology Assessment Office at the German Bundestag (TAB), ITAS has always run the office – alone or with partner organizations. The scientific institute itself also performs TA activities beyond the spectrum of the German Parliament, conducting self-defined work as well as commissioned research that support science, business, ministries and the general public in decisions regarding future technological developments.

The Rathenau Institute (KNAW-RI¹⁹⁰) at the Royal Academy of Arts and Sciences is the Dutch TA organization. It consists of two departments: Science System Assessment (SciSA), which studies the organization and performance of the Dutch Science System and Technology Assessment (TA). The TA department puts a lot of emphasis on political and public debate as well as innovating ways of communication.

NBT: The Norwegian Board of Technology¹⁹¹ advises the Norwegian Parliament as well as governmental bodies and the general public and is committed to foster knowledge and debate on social and political issues raised by Science and Technology.

ITA; The Institute of Technology Assessment at the Austrian Academy of Sciences (OeAW¹⁹²) is a scientific TA institute. It was granted a privileged relationship to the Austria Parliament in the course of the PACITA project¹⁹³. It thus evolved from associate member to a full EPTA membership.

IST: The Institute Society and Technology¹⁹⁴ was the PTA institute in Flanders

¹⁸⁸ <http://www.tekno.dk/> (last accessed 25th of April 2017)

¹⁸⁹ <http://www.itas.kit.edu/> (last accessed 25th of April 2017)

¹⁹⁰ <http://www.rathenau.nl/> (last accessed 25th of April 2017)

¹⁹¹ <https://teknologiradet.no/> (last accessed 25th of April 2017)

¹⁹² <http://www.oeaw.ac.at/ita/> (last accessed 25th of April 2017)

¹⁹³ <http://www.oeaw.ac.at/ita/projekte/news/wissenschaftliche-expertise-als-unterstuetzung-fuer-abgeordnete> (last accessed 25th of April 2017)

¹⁹⁴ <http://ist.vito.be/> (last accessed 25th of April 2017)

(Belgium). It was located inside the Flemish Parliament's administration but had a broader board of governance than just MPs along with a wider mission including to stimulate public debate. With its closure, it had to exist until the PACITA project ended in 2012.

TA-Swiss: Centre for Technology Assessment in Switzerland¹⁹⁵ is a public institution and advisory body to the Swiss Parliament and the Federal Council combining expert studies with a concern for citizen consultations.

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ARC Fund: Applied Research and Communications Fund¹⁹⁶ is a Bulgarian NGO that describes itself as promoting the knowledge economy and stimulating innovation, competitiveness and economic growth via technology and know-how transfer, innovation counseling and training. It also does policy advice for the elaboration of sectorial, regional and national innovation policies.

ITQB: Institute of Technology of biology and chemistry¹⁹⁷ is a Portuguese research and advanced training institute in the fields of Chemistry, Biological Chemistry, Biology, Plant Sciences and Technology. It is part of an *Associate Laboratory* in Portugal. It is concerned both with fundamental research, industrial applications and public understanding of science.

FCRI: Catalan foundation for Research and Innovation¹⁹⁸ was a non-profit institution coordinating Catalan research and innovation in Spain. It has more recently become the Agency for Research of Catalonia. It is concerned with the promotion of science education as well as bridging science and the economy. It is important to note that FCRI is one of the 4 institutional members that, along with political representatives, run the Catalan EPTA member CAPCIT (Advisory Council on Science and Technology of the Catalan Parliament).

KEF: The Knowledge Economy Forum¹⁹⁹ is a Lithuanian association of university, scientific research institutions, student's organizations, business organizations, scientists and politicians as well as individual persons that seeks to reform the research, education and higher education system in accordance with the knowledge economy. It has experience in foresight methodologies as well as in policy analysis and advice.

TC ASCR: The Technology Centre²⁰⁰ is a private non-profit organization established by

¹⁹⁵ <https://www.ta-swiss.ch/> (last accessed 25th of April 2017)

¹⁹⁶ <http://www.arcfund.net/> (last accessed 25th of April 2017)

¹⁹⁷ <http://www.itqb.unl.pt/> (last accessed 25th of April 2017)

¹⁹⁸ <http://www.fundacioerca.cat/> (last accessed 25th of April 2017)

¹⁹⁹ <http://www.zef.lt/> (last accessed 25th of April 2017)

²⁰⁰ <http://www.tc.cz/> (last accessed 25th of April 2017)

the Czech Academy of Sciences with an initial technology transfer objective. Nowadays it carries out analytical and strategic studies for different Czech Ministries. It has recognized methodological expertise notably in evaluation and foresight.

SPIRAL²⁰¹ is a research center in the department of political science at the University of Liège (ULg) in Belgium. It conducts research and consultancy at local, regional, national and international level in the areas of science, technology and society; public policy analysis and evaluation; risk analysis and deliberative democracy.

²⁰¹ <http://www.spiral.ulg.ac.be> (last accessed 25th of April 2017)