

Strengthening Technology Assessment for Policy-Making

Report of the Second Parliamentary TA Debate, 7-8 April 2014, Lisbon



PACITA

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Executive summary

The aim of the Second Parliamentary Debate on Technology Assessment (TA), held at the Portuguese Parliament in Lisbon on 7–8 April 2014, was to explore the role and use of TA in national and European policy-making processes. The discussions promoted a common understanding of the notion of TA among the participants: TA can be seen as a methodological approach delivering a comprehensive and independent analysis of the socioeconomic requirements for the implementation of new technologies, as well as the possible social, economic and environmental impacts. It provides a basis for democratic decision-making in an era of major technological and related social changes.

Knowledge-based policy-making: needs and difficulties

When TA was introduced in Europe in the late 1980s and early 1990s to address science and technology issues, parliaments were expressing a need for a new democratic instrument that would be impartial and independent, employing credible, scientific methodologies. Some 25 years later, policy-makers have the same requirements for independent, structured policy advice on innovation and technology-related issues. They also consider TA as a means of fostering constructive dialogue and generating ideas on such issues. Thus, as well as being a tool for producing knowledge, TA provides a unique space where all actors can be brought together to elaborate common perspectives. This view of the mission of TA is in line with the new concept of Responsible Research and Innovation (RRI), which makes states responsible for ensuring that instruments for stakeholder dialogue are in place in the early stages of technology design and innovation.

Despite the added value of TA as a tool providing policy-makers with comprehensive and independent information, this approach may compete with other forces involved in decision-making processes and politics. The inputs provided by TA – though evidence-based – may be drowned out by political bargaining processes and the interplay of various interests, values and strategies. Likewise, policy makers may select information that supports their opinions and positions, rather than using the results of TA to evaluate the options available. Moreover, the long-term perspective of TA is often at odds with the short-term priorities of political cycles.

TA in new countries: creating tailor-made solutions

One of the aims of the PACITA project is to explore and discuss the barriers and opportunities for establishing TA in countries where it is so far lacking (in an institutionalized form). Within the project, one work package was dedicated to exploring the prospects and challenges for the introduction of TA in the Czech Republic, Bulgaria, Hungary, Ireland, Lithuania, Portugal and Wallonia. This exploratory work package revealed the existence of a - frequently unconcious - need for transparent, knowledge-based decision-making on science and technology. But it also showed that TA cannot simply be imported: the national or regional context has to be considered when discussing the introduction or deployment of new TA activities, and each country has to develop its own TA model. The advisory role of TA may take various forms, tailored to the needs and expectations of science and technology decision makers. New visions have to be developed for the institutionalization of TA, in addition to the - traditional, but still relevant - provision of support for parliaments.

Strengthening TA in Europe: next steps

The long process of strengthening and enlarging TA across Europe should be based on a roadmap, so that all the actors involved share a common vision of its mission and role, and can coordinate their efforts. The first elements of this roadmap should be the inclusion of policy-makers' needs and the establishment of a long-term strategy for communicating with members of parliaments and other political actors. The roadmap should also take into account the fact that current developments in science and technology are radically modifying our societies and thus need to be debated by society. This means that TA needs to go beyond parliaments and understand its role at the interface between parliament, government, science and technology, and society. In addition, the roadmap should distinguish between global or at least European - policy-making issues and national or local issues. Whereas issues such as nanotechnologies or climate change can be addressed at the European level, local issues should be at the core of national or regional TA units. Finally, the roadmap should strive for institutional innovation capable of incorporating country-specific features as well as more general trends in science and technology governance, such as RRI - now increasingly important within the European Commission.

On a more practical level, policy-makers attending the Second Parliamentary TA Debate in Lisbon called for the creation of a European TA



network to contribute to the strengthening of TA in Europe. Such a network – which could be a result of, or follow-up to, the PACITA project should comprise a large number of partners, from existing parliamentary TA institutes represented in the European Parliamentary Technology Assessment (EPTA) network, to scientific organizations or NGOs interested in promoting TA. This would be an ideal structure to foster reflection and innovative thinking on the aims, methods and institutional settings of TA in a globalized and interconnected world. It would also offer unique opportunities for sharing TA results among partners. Within PACITA, first steps have already been taken in this direction with the setting-up of a TA Portal, and some TA institutes already translate policy briefs or reports into English, so that their results can be exported to and adapted in other countries. Such knowledge sharing may be an effective way of enabling organizations seeking to initiate TA activities in their own country. Another task for a European TA network would be to build capacity, i.e. training people to conduct TA and to undertake TA projects.

1. Introduction

In recent decades, Europe has seen the rise of Internet and mobile technologies and the birth of emerging technologies such as geoengineering, nano- and biotechnology. Science and innovation are at the heart of the EU's strategy for the creation of growth and jobs, and are also expected to meet societal challenges such as climate change, terrorism, sustainable consumption and ageing populations - the so called grand challenges. But science and innovation also raise political and societal issues: for example, advances in biotechnology and biomedicine give rise to new ethical questions, information and communication technologies can create new addictions and environmental problems, and developments in nanotechnology and genetic engineering are accompanied by new risks for human health and the environment. Technology and innovation thus concern both society at large and – as representatives of society – policy-makers at the national and European level.

1.1 Technology Assessment: a democratic tool for parliaments and society

Technology is clearly one of the strongest forces driving change in society today, and the choices made on the use of new technologies have economic, social, ethical, political and environmental dimensions. Technology-related policies thus need to be based on a thorough understanding of how science, innovation and society

«We cannot live in the new scientific and technological age without new democratic instruments. The democracy of the technology age needs such instruments as Technology Assessment.»

René Longet, former member of the Swiss Parliament and expert in sustainable development, Switzerland interact. As well as considering all the relevant and known facts about specific technologies or related issues, policy-making has to address uncertainties and consider the needs and aspirations of societal actors. It is, however, difficult for policy-makers to achieve such a comprehensive perspective, as the knowledge provided by lobbyists, scientists, administrators and other groups may often be fragmented and partial.

Technology assessment (TA) is a response to these difficulties: by comprehensively analysing the socioeconomic requirements for the implementation of new technologies, as well as the possible social, economic and environmental impacts, it provides a basis for democratic decision-making. TA is thus a democratic instrument designed to facilitate dialogue between science and society. As stated by René Longet, a former member of the Swiss Parliament who, in the early 1980s, initiated the process whereby TA-SWISS was created, «It is a democratic requirement to organize discussions on the ways to manage and guide technological developments for the good of society.» He adds: «Democratic processes in Parliament and in society need a scientific methodology such as technology assessment to speak about the effects of science and innovation. The final purpose of TA is to provide a kind of user manual of technologies, so that they serve the common good and can contribute, not only to states' and economic interests, but also to cultural, human and social progress.» This view was echoed by Wiebe Bijker, Professor of Technology & Society at the University of Maastricht, who chaired the meeting: «TA is a democratic practice, but it is also a practice that is necessary for democracy.»

More specifically, TA provides parliaments and other policy-makers with scientific evidence, scenarios, policy analysis and insights concerning the societal challenges and opportunities associated with science, technology and innovation. It uses methods which integrate various scientific disciplines, as well as the interests and values of citizens and stakeholders in society. According to Lars Klüver, Director of the Danish Board of Technology: «TA goes across scientific disciplines, across theories and across scientific tools. It translates scientific knowledge into things that are relevant for policy-making.»

1.2 PACITA: Building a common and differentiated vision of TA

Within the PACITA project, the European TA community initiated a dialogue with policy-makers so as to build a common vision of the role of TA, while taking into consideration the political and institutional specificities of each country. Such a common understanding is a necessary step towards further deployment of TA activities - focusing on policy-makers' needs - in Europe. A first debate, held in Copenhagen in June 2012, was dedicated to the general issue of knowledge-based policy-making. At that meeting, policy-makers said that they expected TA to create transparency on science and technology, and to provide advice on both scientific and societal aspects of research and innovation. For the TA community, this means presenting facts to policy-makers in a comprehensible manner and highlighting the risks and values associated with science and innovation. The globalization of science and technology was also considered an important guestion for reflection, as new forms of policy advice have to be developed to serve policy-making on global and cross-border issues.

The aim of the Second Parliamentary Debate on Technology Assessment, held at the Portuguese Parliament in Lisbon on 7–8 April 2014, was to explore the role and use of TA in national and European policy-making processes. The 20 parliamentarians and policy-makers attending the meeting shared with the TA community



PACITA (Parliaments and Civil Society in Technology Assessment) is a four-year EU-financed project under FP7 aimed at increasing the capacity and enhancing the institutional foundation for knowledge based policy-making. Based on the diversity of practices in Parliamentary Technology Assessment across Europe, it is designed to promote mutual learning among policy-makers, scientists and TA professionals. One of the activities of PACITA is to set up various arenas for discussion of TA and its contribution to policy-making. Several events are being held, including debates with policy-makers.

www.pacitaproject.eu

their views on opportunities and options for strengthening TA in Europe. Their contributions to the discussions were based on specific experiences and initial results of the PACITA project. The event was jointly organized by the Swiss Centre for Technology Assessment (TA SWISS) and the Institute for Chemical and Biological Technology (ITQB) of the New University of Lisbon.

> «A good understanding of the interactions between science and society is increasingly important for policymaking in order to mitigate risks, to avoid gaps in regulation, and to increase social welfare, making the most out of future opportunities.»

> António Fernando Correia de Campos, member of the European Parliament and Chairman of the Science and Technology Options Assessment (STOA) Panel

2. Shaping policies with TA

Parliaments have to take decisions and legislate on technological issues of various kinds. They may regulate the development and use of technological innovations in order to mitigate risks or prevent abuses, but also set the framework for technological innovation to achieve specific - e.g. health, environment or energy - policy goals, or to meet public policy concerns such as security, economic and financial stability, or employment. The policymakers attending the meeting emphasized the complexity of the issues they have to deal with and the necessity to take into account the ethical, legal and societal dimensions of science and innovation. «Good decisions» need to be based on comprehensive knowledge.

To gain insights into technology related issues, policy-makers usually rely on a wide network of experts and NGOs. For instance, parliamentary committees may consult experts, stakeholders and NGOs as part of the policymaking process. However, according to Maria de Belém Roseira, a member of the Portuguese Parliament, «this is fragmented knowledge, which is further often influenced by lobbyists and interest groups, so that it is difficult for policy-makers to get a full and coherent picture of the issue at stake.»

«We have to fight blindness when we legislate, we have to have strategic thinking and we need to be aware through information. So technology assessment is a very important tool.»

Maria de Belém Roseira, member of the Portuguese Parliament

2.1 TA for structuring knowledge

When TA was first introduced in Europe in the late 1980s and early 1990s, parliaments were expressing a need for independent and comprehensive advice on new technologies and their consequences. Looking back to the first political demands for TA units in the 1980s, René Longet recalled: «To cope with science and technology issues, policy-makers needed a new democratic instrument that would be impartial and independent, employing credible, scientific methodologies so as to document the issues at stake and highlight the different interests and positions in play.» These requirements led to the creation of units such as the Parliamentary Office of Science and Technology (POST) in the UK, the Parliamentary Office for the Evaluation of Scientific and Technological Options (OPECST) in France, the Office of Technology Assessment at the German Bundestag (TAB), the Swiss Centre for Technology Assessment (TA-SWISS), the Danish and Norwegian Boards of Technology (DBT and NBT), and the Science and Technology Options Assessment unit (STOA) at the European Parliament. These units have provided policy advice for parliaments (and in some cases governments and other policy actors) by structuring the knowledge of the many actors involved (scientists, users and other stakeholders), assessing the implications for policy-makers and elaborating policy options. According to Michel Antoine, Deputy Director of OPECST, TA units organize and «civilize» debate on controversial issues.

Some 25 years later, policy-makers have the same need for independent and structured policy advice on innovation and technologyrelated issues. Maria de Belém Roseira, for instance, stated: «What we would like to have in Portugal is a very small structure which would make available studies about consequences of new technologies on which Parliament has to decide. Members of Parliament have to be aware of the chances and the risks. We know it can be done in a structured way. And it doesn't have to be a big structure; a small team can do it, relying on existing networks.» Going a step further, Felix Gutzwiller, a member of the Swiss Parliament, highlighted the role of TA in structuring knowledge concerning the views and interests present in society: «Technology assessment is not only about getting expert knowledge, but also about revealing the views of stakeholders and of the general public through participatory methods.»

2.2 The case of genomics in healthcare

The use of genomics within the health system is an interesting case of what TA can contribute to policy-making. Advances in biomedicine and information technology are leading to ambitious and powerful innovations in healthcare. It is expected that the coupling of genomics and big data will increase our understanding of the mechanisms and causes of diseases, thus enhancing the quality of medical treatments and improving prevention in certain areas. This may lead to healthcare practices that are more personalized, predictive, preventive and consumer-driven. These developments will affect healthcare systems in Europe, and policy-makers are currently considering how to ensure that the use of genomic technologies in public health services does not have detrimental consequences. In particular, the extent to which - and purposes for which - genomic data is collected, stored and shared is regarded as a key issue for the further development of genomics in healthcare. The economic consequences for the healthcare system are also being discussed in relation to states' efforts to reduce public and health expenditures. Dealing with these issues requires a wide knowledge of what genomics is and can do, how its development is linked to information technologies, and what the consequences may be in terms of health service provision, data protection and health costs, as well as more general ethical principles, such as solidarity and equity in healthcare.

Several TA projects have addressed these issues, providing advice for policy-makers. Recently, for example, TA SWISS published a study on personalized medicine¹ in order to contribute to the political debate on genomics and related issues. As Felix Gutzwiller pointed out, «the political system in Switzerland has been interested in personalized medicine for what it could bring in terms of prevention, medical treatments and market opportunities, but also because it raises many issues in terms of personal rights and costs.» The report presents a comprehensive and thorough analysis of the current status and future ambitions of personalized medicine, highlighting its implications for the Swiss health system and society at large. Of particular relevance for policy-makers are the recommendations relating to data protection and personal rights.²

Recent developments in genomics and information technologies have also been addressed in a PACITA project involving experts and parliamentarians (the European

¹ Anne Eckhardt et al., TA-SWISS (ed.), 2014. Predictive Medicine (abridged version of «Personalisierte Medizin», vdf Hochschulverlag AG, Swiss Federal Institute of Technology, Zurich). 2 In Switzerland, current legislation specifies requirements for the protection of genetic data but does not cover other biological characteristics which also allow conclusions to be drawn concerning future risks of disease. The report thus recommends that the scope of the Federal Act on Human Genetic Testing should be extended to cover all biological data and suggests that policy-makers should consider the introduction of a general ban on discrimination based on disease risks. It is also recommended that some of the findings of the report should be considered in the current parliamentary discussions on the revision of the Data Protection Act.



Future Panel on Public Health Genomics). Parliamentarians were at the core of the project, as they initially defined the major policy guestions relating to the future of public health genomics. These were then addressed in four Expert Working Group Reports, which provided the basis for an Expert Paper focusing on the policy issues raised by developments in public health genomics³. Finally, policy options for dealing with these issues were described and then discussed by parliamentarians and experts at a policy hearing. This collaborative effort demonstrated the need for a step-by-step approach, framed by welldefined and informed policies on data-sharing, privacy and clinical practices, to deal with the manifold uncertainties surrounding healthcare genomics. Good governance calls for the organization of pilot experiments in different contexts and countries; the engagement of stakeholders (including patient advocacy and civil society groups concerned with genome sequencing issues) in experimentation, assessment and decision-making; and the use of the best practice guidelines and legislation already available for genetic testing services.

These examples show how TA can help policymakers and society to set a framework for personalized medicine. As Wiebe Bijkers commented: «Personalized medicine is among us, but that doesn't mean we cannot change it, adapt it and tailor it to our own principles and values.»

2.3 TA for strategic thinking

In many cases, TA does much more than structuring knowledge for evidence-based policy-making. It essentially provides a space for constructive dialogue and the generation of

ideas on technology-related issues. This 3 Mara Almeida, Institue of Technlogy of biology and chemistry (ITQB), Portugal (ed.), Policy Hearing Report, EPTA-PACITA 2014.. function of dialogue on policy issues allows for common strategic thinking. This was the case, for instance, in a project on sustainable mobility carried out in France by OPECST. The original aim of the project was to assess the technological options for future cars and how they could help to maintain the competitiveness of the French automobile industry. But, in the course of the project, it became apparent that the industry's future is linked to technological and social changes, administrative practices and policy strategies. In thinking about the future of the automobile industry, one needs to understand mobility patterns, to integrate public policies on energy, environment and urban development, and to consider the role of government vis à vis the industry. As a result, the project adopted a global approach, including technological and social dimensions, and involved engineers, social scientists, urban planners, industry representatives, etc. The project thus evolved from a scientific assessment of the car industry in France into a platform for comprehensive reflection on the future of mobility in France. As this example shows, TA is not only a tool for producing knowledge, but also provides a unique space for dialogue. According to Michel Antoine: «We need a place where we can bring together actors and where we can elaborate a common perspective on a policy. TA structures are the ideal tool to do it.»

This view of the mission of TA is in line with current discussions on the concept of Responsible Research and Innovation (RRI) within the European Union and member states. René von Schomberg, who has significantly contributed to the definition and dissemination of RRI, commented: «Policies need to shift their focus from risk governance towards innovation governance.» He observed that, in modern societies, technology is privatized in its production and democratized in its use.

He also noted that innovation is widely viewed as inherently good because it allows economic growth and prosperity. In this regard, the role of the state is to drive innovation while, at the same time, mitigating the possible risks by establishing safeguards to ensure product safety and guality. However, according to von Schomberg, this role is challenged by modern innovations such as nanotechnology, where a comprehensive risk assessment is barely possible, given the resources that would be required to assess thousands of nanoparticles. Moreover, risk assessment also involves ethical norms, which may vary from country to country. It is thus important to think about new modes of governance, and RRI may provide a new way of dealing with risks and uncertainties. In fact, the emerging concept of RRI suggests that the state's responsibility should include the establishment of instruments for stakeholders to discuss and define at a verv early stage what they want to achieve with a given technology, and how it should be designed so as to avoid adverse impacts. This is a radical change in the way states are considering research and innovation policies, and TA could certainly contribute to this shift by developing and implementing tools for sustained dialogue between research, industry and stakeholders - as occurred, for example, in the French project on sustainable mobility.

> «We need an open and transparent approach to decision-making in order to improve the quality of decisions reached, to stimulate public debate and to build general awareness on topics that are essential for our future.»

Ruperta Lichtenecker, member of the Austrian Parliament

3. Linking TA with parliaments

Across Europe. TA has various organizational models, lying more or less close to national parliaments. France has perhaps the most inclusive TA model, with parliamentarians actually conducting TA, while Denmark or the Netherlands have a totally different organizational model, with the TA unit being independent in terms of content and funding. It may be easier for a TA unit to be attached to a parliament, i.e. working on issues defined by MPs or a dedicated commission; however, this way of operating may not fit the political culture or system, e.g. in countries such as the Netherlands, Switzerland or Denmark. There is no indication that operating inside or outside a parliament is the better way of conducting TA, and many models coexist in Europe, with their strengths and weaknesses. TA units thus need to develop different modes of interaction with parliamentarians, according to the institutional setting and the political culture of the country concerned.

3.1 Difficulties of integrating TA into policy-making

Despite the added value of TA as a tool providing policy-makers with comprehensive and independent information, several policy-makers noted that this approach may compete with other forces involved in decision-making processes and politics. Firstly, the political arena comprises many stakeholders with different experiences. concerns and views about specific issues and how to deal with them. The inputs provided by TA - though evidence-based - may be drowned out by political bargaining processes and the interplay of various interests, values and strategies. Likewise, policy-makers may select information that supports their opinions and positions, rather than using the results of TA to evaluate the options available.

Secondly, the long-term perspective of TA is often at odds with the short-term priorities of political cycles. This difficulty is related to what António Fernando Correia de Campos calls «What we need is slow democracy. Spaces to take the time to think further, to think for tomorrow. It is a challenge for our political system based on representative democracy.»

Sébastien Brunet, Head of the Walloon Institute for Evaluation, Prospective and Statistics

the «anticipative intelligence of technology assessment»: TA has to cope with a degree of uncertainty about the future, which is somewhat difficult to integrate into policy-making, especially in parliaments. Finally, expectations may be too high - i.e. policy-makers may expect TA to offer specific policy options for immediate consideration, whereas TA is mainly concerned with informing, raising awareness and sensitizing policy-makers and is thus a lengthy process. The long-term perspective of TA is nevertheless an essential feature, which should be maintained, as it is one of the very few instruments fostering long-term political thinking. In the view of Michel Antoine: «There is a need to reconcile short-term and long-term policies. TA is a very interesting tool to do that.»

It is sometimes difficult for TA units to gain the attention of parliaments, or they may underestimate the need to keep policy-makers informed about their activities. Jens Henrik Thulesen Dahl, a member of the Danish Parliament, commented: «It is important that people working in the area of TA keep the politicians informed and make clear to them how to use the TA work.» This statement reflected his experience as a new member of Parliament when the grant for the Danish Board of Technology (DBT) was discontinued under a savings plan to finance the research budget. MPs did not realize that they were about to close an important institution, as many of them knew «We need a sustained conversation between scientists, members of parliaments and policy-makers. Technology assessment is a process, not a technocratic quick fix for a problem.»

Wiebe Bijker, Professor of Technology & Society at the University of Maastricht

little about the DBT or its activities. They only became aware of the kind of services provided by DBT when they received reactions from within Denmark and all over the world opposing their decision. Parliament is now discussing new modes of cooperation with the DBT – which has in the meantime been transformed into a nonprofit private foundation. In the US, the OTA suffered a similar fate in 1995: it was the victim of a budgetary dispute and was closed down because the Congress didn't really appreciate its significance.

3.2 The Austrian case: establishing links between TA and Parliament

Recent developments in Austria are very instructive – and good news – for those interested in strengthening parliamentary TA. The Institute of Technology Assessment (ITA) was established within the Austrian Academy of Sciences in 1994, without any formal links to Parliament. This was an initiative of the scientific community to address the impacts of new technologies on society. Recent years have seen some positive developments, as noted by Ruperta Lichtenecker, Chairwoman of the parliamentary Committee for Research, Innovation and Technology. The Austrian Parliament has discussed the significance of TA on several occasions, and ITA experts have been regularly invited by the Committee to speak on technology issues. A regular communication

channel has also been established between the ITA and Parliament. Moreover, the ITA regularly distributes policy briefs («ITA Dossiers») on issues of interest to Parliament. Within a few years, ITA has succeeded in being recognized as a scientific actor able to contribute to broad, open and transparent political discussions.

In 2013, all parties agreed to intensify parliamentary TA activities and to strengthen cooperation between Parliament and the ITA. As a result, the Austrian Parliament is now discussing how to organize such cooperation and considering funding options. The general idea is to propose cooperation based on the needs of policy-makers, which could mean political parties or committees commissioning the ITA to work on specific topics.



4. Prospects for TA in new countries

One of the aims of the PACITA project is to explore and discuss the barriers and opportunities for establishing TA as a means of providing policy advice in countries where it is so far lacking (in an institutionalized form). Consequently, one PACITA work package was dedicated to exploring the prospects and challenges for the introduction of TA in the Czech Republic, Bulgaria, Hungary, Ireland, Lithuania, Portugal and Wallonia. The exploratory work package was designed and organized in such a way as to initiate reflection, networking and possibly planning with regard to national TA infrastructures in the countries studied. It involved interviews with relevant actors in each country. as well as national workshops for policy-makers, stakeholders, representatives of science, public administration, media and civil society.

4.1 Latent needs for TA

The interviews and national workshops organized in the so-called non-TA countries provided an opportunity for decision-makers and other stakeholders to express their need for knowledge-based and transparent decision-making on science and

The Paris Declaration: parliamentarians call for European TA

Parliamentarians and TA Directors regularly meet and share their experiences at the annual conference of the EPTA network. In 2008, when the EPTA meeting was held in Paris, parliamentarians signed a common declaration laying the foundations for the PACITA project. The Paris Declaration underlined the importance of TA for parliaments in directing and assessing public policies in the fields of science and technology. It called for coordination between national parliaments and the European Parliament so as to exchange expertise, strengthen TA across Europe and promote exchanges between MPs on science and technology issues. The European Union was urged to establish a framework for such activities, and the PACITA project was subsequently launched.

technology. In new (eastern) EU member states and in Ireland, interviewees and workshop participants became aware of what TA could offer, and the PACITA project revealed latent needs for TA products. As noted by Leonhard Hennen, who led this activity within the PACITA consortium, «In these countries, policy-makers felt that decisionmaking on science and technology-related issues could be improved, but didn't have a clear picture on how to do it until they got to know about the concept of technology assessment.» In countries or regions where the concept of TA has been discussed in academia and in the political arena for some years (Portugal, Wallonia), the PACITA project successfully supported the efforts of national actors to establish TA infrastructures.

4.2 History matters

The interviews and workshops conducted in the various countries showed, however, that the specific national context has to be considered when discussing the introduction or deployment of new TA activities. Existing TA models cannot simply be exported to non-TA countries: each country has to develop its own TA model, which will be more or less inspired by existing TA models. New EU member states, for instance, have to deal with specific political and economic issues arising from their recent history: their R&D systems are being built up or restructured, innovation is seen as a major factor for economic growth and there is little public debate on science and technology. According to Alena Gajduskova, First Vice-President of the Senate of the Czech Parliament, «there is a lack of political responsibility with respect to technology, as science and innovation have been left to the market since the post-totalitarian transition.»

This point clearly emerged from the interviews and national workshops conducted in the non-TA countries within the PACITA project. The comparative discussion of the country studies clearly revealed that the context for the establishment of TA in these countries differs significantly from the historical situation in the 1970s and 1980s, when first calls for technology assessment were made in western and northern Europe. Whereas in the 1970s and 1980s, science and technology were subject to vigorous public debates, with significant parts of the general public demanding to be involved in decision-making, public awareness of science and technology-related issues is limited in the countries in guestion. In addition, in contrast to the 1970s and 1980s, there is no expressed demand for unbiased policy advice in the field of science and technology to legitimize decisions taken amid vigorous public discourse and often conflicting interests. Furthermore, the countries studied are busy building up or reforming existing R&D structures with an urgent need to keep up with the pace of globalization, whereas 30 years ago TA was established in countries with strong R&D infrastructures underpinning well-developed economies and public welfare. Thus, whereas the focus 30 years ago was on environmental and health risks and sociopolitically sound governance of science and technology, today's priorities are «economy first», i.e. promoting science and technology dynamics and innovation for economic development in a climate of global competition and financial crisis.

4.3 Tailor-made TA

These specific conditions have to be taken into consideration when searching for ways to establish TA structures in new countries. For these countries, the advisory role of TA may take other forms, tailored to the needs and expectations of decision-makers. The PACITA project revealed that in Ireland, Portugal and Wallonia, there is an explicit interest in setting up TA activities for parliamentarians. In Lithuania and Bulgaria, the establishment of a national TA network coordinated by NGOs is currently being explored, while in Hungary and the Czech Republic the inclination is to build on existing policy advice activities traditio-

TA outside Europe

In the US, TA is a kind of phoenix: since the closure of the OTA in 1995, several initiatives have been launched to continue its activities. One of its successors is the US Government Accountability Office (GAO) – an independent agency providing Congress with «timely information that is objective, fact-based, nonpartisan, nonideological, fair, and balanced» (cf. www.gao.gov). According to David Cope, «the way it is organized could be an inspiration for TA activities in Europe.» Being a small unit, GAO hires civil servants from government departments for specific projects.

Discussions now taking place in Japan may also yield interesting insights for Europe. There, though the institutional or organizational form of TA is not being addressed, the demographic and energyrelated challenges currently faced by Japanese society may bring stimulating insights for the future of TA. In David Cope's view, «there will be some enormous messages for Europe coming from Japan related to demographic changes and urban structures.»



nally undertaken by the Science Academies.

According to the comparative analysis, the national initiatives taken in the countries studied involve new visions for the institutionalization of TA in addition to the – traditional, but still relevant – provision of support for parliaments. In countries where the R&D system is being restructured, TA could contribute to the planning of R&D structures and evaluate R&D capacities. In countries driven by the idea of «economy first», TA could serve as a pathfinder for socially robust innovation strategies by making structures more transparent and bringing actors together for discussion. It could also stimulate public debate, raising public awareness of science and innovation issues.

There is clearly a need to further explore the practical consequences of national and regional specificities for the establishment of TA in new countries. More importantly, TA needs to be tried out with pilot activities and projects, so as to test its contribution to science and technology-related issues of national relevance.

4.4 PACITA and the establishment of TA: the cases of Portugal and Wallonia

In some countries, the establishment of parliamentary TA has been discussed for many years, and PACITA offered an opportunity to support national efforts towards knowledge-based policymaking. This is true, for instance, of Portugal and the Wallonia region, both represented in the PACITA consortium.

In Wallonia, the process of establishing a TA unit started in 2008, when Parliament adopted a resolution calling for knowledge-based policy advice in the form of TA activities. This first step towards TA was the result of close interactions between academics at the University of Liège and members of Parliament. As the University of Liège is part of the PACITA consortium, these interactions continued over the years: fruitful discussions were held between academics, other PACITA partners, ministries and members of Parliament about the mission, institutional form and organization of the future TA unit in Wallonia. According to Sébastien Brunet, Head of the Walloon Institute for Evaluation, Forecasting and Statistics (IWEPS), «The next step will be to create a large network of scientists able to give advice to policy-makers on a variety of science and technology issues.»

Portugal is another country where TA has been discussed for some years, but no TA unit has been established to date, mainly due to financial constraints. The PACITA project helped to keep alive the discussion of TA within the Portuguese Parliament, as MPs were involved in several workshops and discussions (including the Parliamentary Debate). According to Rui Pedro Duarte, a member of the Portuguese Parliament, «There is a broad consensus among Portuguese policymakers about the need to get independent, knowledge-based policy advice and the value of technology assessment.» However, due to the country's financial situation, the creation of a TA unit is not yet on the agenda. Policy-makers are promoting national and international networking with academics and existing TA institutes abroad.

> «We have to change the manner of thinking in many societies and make people aware of the role of technology in social life; we need to educate the scientists, the engineers, the lawyers and many others to prepare the ground for TA in Europe.»

Jan Kaźmierczak, member of the Polish Parliament and of the Parliamentary Assembly of the Council of Europe

5. Strengthening TA in Europe – a roadmap

Strengthening TA in Europe is a long process, which has to take into consideration the political, economic, cultural and scientific specificities of individual countries, whether or not they already have a TA unit. There is a need to develop innovative and effective country-specific ideas and solutions. This process should be based on a roadmap, so that all the actors involved share a common vision of the mission and role of TA and can coordinate their efforts.

5.1 Include the parliamentarians ...

The TA units created in the 1980s and 1990s were demanded by parliamentarians, and current efforts to create such units in Wallonia and Portugal are being undertaken by politicians. Similarly, the existence of PACITA is attributable to the clear and determined support of the policy-makers who signed the Paris Declaration (see Box p. 14).

Strengthening TA thus requires a permanent strategy for communication with policy-makers, taking into account their basic needs and working conditions, which may vary from country to country. Policy-makers have to understand what TA can bring to the political process, but also to them personally in their daily work and responsibilities. TA has to be explained to

«If TA is what it claims to be, it is at a time of financial constraints that you need TA more than ever. Because TA provides pointers towards how to move out of the period of financial constraints. Actually, it is just the time – more than in a period of economic largesse – for adopting TA.»

David Cope, Foundation Fellow, Clare Hall, University of Cambridge, and former Director of POST policy-makers, not because they do not really want it, but because it is not formally part of the decision-making process. According to Ulla Burchardt, who has chaired the German Parliament's Committee on Education, Research and Technology Assessment and now teaches at the Technical University of Dortmund, «TA is something apart, for which members of parliaments do not receive any recognition for the next election.»

But including parliamentarians in TA involves more than explaining to them what TA is and can offer them. They also need to be included in the various TA activities, so that the topics addressed by TA or TA-like units make sense to them. At the Lisbon Parliamentary TA Debate, participants therefore called for the creation of spaces for dialogue and exchange between policy-makers, so that they can develop common views about TA and take ownership of the concept.

5. 2 ... but think beyond parliaments

Current technological trends involve the capacity to radically modify our societies, with the digitalization of our bodies and our lives and the blurring of the boundaries between humans and machines – what Rinie van Est, a coordinator at the Rathenau Institute, describes as «intimate technology». These trends have huge implications and need to be democratically debated both by parliaments and within society. TA offers a unique perspective and a series of tools for analysing developments and engaging in a conversation with policy-makers, scientists and society. In democratic societies, TA should involve more than producing reports for parliamentarians.

Most existing TA institutes currently think and go beyond parliaments and understand their

role at the interface between parliament, government, science and technology, and society. This is the main result of an analysis of TA practices in Europe, carried out as part of the PACITA project.⁴

The analysis revealed a rich and diverse TA landscape, where TA organizations are shaped not only by their institutional relationship with parliament, but also by their connections with other social spheres – in particular, with government institutions, the science and technology communities, and society at large. Accordingly, TA acts as a knowledge mediator between parliament, government, science and technology, and society. Actors from each of the abovementioned spheres are potential clients of TA units.

Based on these findings, Rinie van Est calls for TA «to open up, to find ways to think about the social meaning of technology in a broad and inclusive way». This is a challenging and ambitious goal, for which concrete actions have yet to be devised.

5. 3 TA for Europe and for nation states

For TA to be relevant for policy-makers and to obtain long-term support, it is important to distinguish between the global and the local. The political relevance of many technologyrelated questions lies at the European level. For instance, the management of possible risks of nanotechnologies or the issue of climate change is governed by policies defined in Brussels. For such global issues, policy advice delivered by TA may thus be more suitable for policy-making at the European level than within member «We need to bridge the scientific and political cultures. This is a continuous learning process, for the TA specialists and for the policymakers.»

Ulla Burchardt, former chair of the German Parliament's Committee on Education, Research and Technology Assessment

states. According to Francisco Veloso, Dean and Professor at the Católica-Lisbon School of Business and Economics, «For the future, global questions such as climate change and nanotechnology are going to migrate towards more European-centred institutions such as STOA, or others that could be created.»

However, there are still many technological issues relevant for individual countries or regions, and policy advice on these issues is also required in national parliaments. For instance, countries with a seaboard will need to address coastal planning, while industrial countries will have to establish the conditions for their manufacturers to remain competitive in the global market. TA thus also needs to address national parliaments, which entails the creation of TA units in individual countries or regions.

5. 4 Institutional innovation

The political and economic context has changed since the 1980s, when TA was established in Europe. The PACITA project highlighted the shift in technology debates from risk management to RRI. Moreover, most countries are facing economic difficulties and budget cuts. This means that TA has to innovate. Each country has to find a reasonable balance between the need for independent policy advice and what «The role of TA is to act as a cultural mediator and translator between science, policy and civil society.» Rinie van Est, Rathenau Institute

a TA unit and other existing institutions could contribute to the policy-making process.

For instance, countries which are currently considering the establishment of a TA unit, but face budgetary constraints, could consider creating a very small unit based in Parliament, supported by universities, science academies, research agencies or science foundations. These would



pay for fellowships, with postdocs working on technology issues of interest for the national political decision-making process. This approach is adopted, for instance, by POST in the UK, with research fellows making up a significant proportion of its staff.

Another option would be the approach adopted by the Knowledge Economy Forum (KEF) in Lithuania, which is seeking to promote the concept of TA among policy-makers. As many of the technological issues that may be of interest to policy-makers are similar to those discussed in other countries where TA has already been established (e.g. Germany), KEF mainly tries to «import» relevant findings made by other TA units, so as to start a national debate on the topic in question. With this model, the work of a TA unit would mainly involve translating and adapting external findings to the national context and fostering debate.

³ Ganzevles, J. & R. van Est (eds.), 2012, TA Practices in Europe. Deliverable 2.2 of the PACITA (Parliaments and Civil Society in Technology Assessment) project, commissioned by the European Commission: PACITA Consortium (available for download from the PACITA website: <u>www.pacitaproject.eu</u>).

6. Towards a European TA network

The path towards the enlargement and strengthening of TA across Europe has still to be defined; country-specific contexts need to be considered, as well as the coexistence of global and local dimensions of science and technology policy-making. For the policy-makers attending the Second Parliamentary TA Debate in Lisbon, these efforts should benefit from the support and cross-fertilization of a European TA network. Such a network – which could be a result of, or follow-up to, the PACITA project - should comprise a large number of partners, from existing parliamentary TA institutes represented in the European Parliamentary Technology Assessment (EPTA) network, to scientific organizations or NGOs interested in promoting TA.

Such a network could play several roles in enlarging and strengthening TA. Firstly, it could act as a think tank, promoting innovative thinking about the aims, methods and institutional settings of TA in a globalized and interconnected world. As was mentioned several times during the Parliamentary TA Debate, the situation that prevailed when most TA units were created has changed in many respects: public controversies have subsided, R&D systems are being restructured and innovation is considered as the key to economic growth. TA needs to take these developments into consideration if it wishes to make a meaningful contribution to policy-making on scientific and technological innovation and, more generally, to the democratic debate in the current technological age. Innovative thinking should also characterize TA methods: there is a need to consider how, for example, participatory methods can contribute to democratic practices in different political systems, or how to take advantage of the increasing possibilities for interaction offered by new communication technologies and current trends such as crowd-sourcing and crowd participation.

Secondly, a TA network could offer unique opportunities for sharing TA results. Within PACITA, first steps have already been taken in this direction with the setting-up of a website (the TA Portal, see http://technologyassessment.info), which functions as a central information and training hub for TA activities in Europe. Some TA institutes also integrate knowledge sharing into their strategies, translating policy briefs or reports into English, so that their results can be exported and adapted in other countries. This may be an effective way of enabling organizations seeking to initiate TA activities in their own country to provide independent and comprehensive knowledge to policy-makers and other stakeholders.

Another task for a European TA network would be to build capacity, i.e. training people to conduct TA and to undertake TA projects. For more than a decade, the EPTA network has organized «practitioners meetings», where TA project managers meet and share their experience. Similar meetings have been held as part of the PACITA project, bringing together practitioners from existing TA units and project managers involved in the development of TA activities in their countries. This setting has proved highly effective, as both existing TA units and newcomers need to build capacity within their organizations. It would certainly be an asset for the TA community if such meetings could continue.

Capacity building should also include the testing of TA methods and projects. Initiated by the EPTA network, these activities have been further developed within PACITA in the form of three cross-European projects (the Future Panel on Public Health Genomics, the Ageing Society scenario workshops and the Sustainable Consumption citizen consultations). These projects provided a unique opportunity for new countries to learn how to apply the TA approach and gain practical experience of providing independent and comprehensive policy advice. They also proved to be a very effective way of building synergies across borders and taking advantage of the various partners' knowledge and experience.

For such a network to fulfil its role, however, various conditions need to be met. Firstly, financing is important. The EPTA network, for instance, does not have a specific budget: each partner pays for the activities it is involved in - meetings, seminars or projects. This model has its limits, especially with regard to work on common projects, as some partners may be able to expend more resources than others and dissymmetries may arise. PACITA, however, benefited from European Commission funding, which enabled all partners to be fully involved in the various activities. Even though the European TA network should be more modest in its ambitions, European Union or Horizon2020 funding - in addition to membership fees would substantially contribute to its success.

Another condition concerns the weight attached to national activities by TA or TA-like organizations within the network. As the members of the TA network would be, for the most part, nationally anchored and funded, it is important that their main focus of interest should remain national. Even though they address global issues, these would have to be linked with national and local debates. The story of the Danish Board of Technology shows how important it is to remain anchored in the national context. This should be achieved by retaining a substantial proportion of national activities, and/or adapting and translating the results of cross-European projects to the national context.



Appendix I: Program of the 2nd Parliamentary TA Debate

2nd Parliamentary TA Debate

Strengthening Technology Assessment for Policy-Making 7-8 April 2014, Lisbon, Portugal

April 7th – Opening of the conference and working dinner Palácio Conde D´Óbidos, Sala do Conselho Supremo (Jardim 9 de Abril, Lisboa)

40.00		
18:30	weicoming	aperitit

19:00 Working dinner

The PACITA project: strengthening knowledge-based and socially robust policy-making Lars Klüver, PACITA coordinator and Director of the Danish Board of Technology, Denmark

30 years of Technology Assessment for Parliaments – and still valid today René Longet, former member of the Swiss Parliament and expert in sustainable development, Switzerland

A next wave of TA? Barriers and opportunities for expanding the European TA landscape Leonhard Hennen, Institut für Technikfolgenabschätzung und Systemanalyse (ITAS), Germany

April 8th – Debating Technology Assessment

Portuguese Parliament, Salão Nobre

9:00	Introduction Debating Technology Assessment, a short introduction Wiebe Bijker, Professor of Technology & Society at the University of Maastricht, the Netherlands
9:15	Doing politics and shaping policies with Technology Assessment
	Paths towards a responsible introduction of Public health genomics Maria de Belém Roseira, Assembly of Republic, Parliamentary Committee of Foreign Affairs and Portuguese Communities, Portugal
	Societal and political issues in personalized healthcare Felix Gutzwiller, Swiss Parliament, Committee for Science, Education and Culture of the Council of States, Switzerland
	STOA at the service of the European Parliament António Fernando Correia de Campos, European Parliament, Chairman of the Science and Technology Options Assessment (STOA) Panel, Brussels
	New mobilities and ecological vehicles Michel Antoine, Deputy Director of the Parliamentary Office for Evaluation of Scientific and Technological Options (OPECST), France

10:15 Discussion

Policy-makers share their expectations and experiences with respect to Technology Assessment

11:00	Break
11:30	Keynote Open and responsible innovation for address René von Schomberg, DG Research and Innov personal capacity), Brussels
12:00	 Prospects for parliamentary TA in new count Panel discussion and dialogue with: Sébastien Brunet, Head of the Walloon In (IWEPS), Belgium Rui Pedro Duarte, Assembly of Republic, Or Portugal Alena Gajduskova, Parliament of the Czeck Republic Leonhard Hennen, Institut für Technikfolg David Cope, Foundation fellow, Clare Hall, Parliamentary Office of Science and Technik Moderation: Wiebe Bijker
13:00	Lunch
14:00	 (Re)establishing links between Parliament a TA in Austria and Denmark: reconsidering the Jens Henrik Thulesen Dahl, Danish Parlian Committee, Denmark Ruperta Lichtenecker, Austrian Parliamen Innovation and Technology, Austria
14:20	 Strengthening Technology Assessment in Eur Panel discussion and dialogue with: Ulla Burchardt, Former member of he Ger Universität Dortmund, Germany Jan Kaźmierczak, Parliamentary Assembly Republic of Poland Rinie van Est, Rathenau Institute, the Net Francisco Veloso, Professor at Católica Lis the Portuguese Council for Entrepreneurs Michel Antoine, Deputy Director of the Pa Technological Options (OPECST), France Moderation: Lars Klüver
15:20	Closing remarks Sergio Bellucci, Director of the Swiss Centre
15:30	End of the conference



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Committee on Education, Science and Culture,

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genabschätzung und Systemanalyse (ITAS), Germany I, University of Cambridge and former Director of the nology, United Kingdom

and Technology Assessment

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nt, Chairwoman of the Committee for Research,

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erman Parliament, Lecturer at the Technische

y of the Council of Europe, Sejm (Parliament) of the

therlands

sbon School of Business and Economics, member of ship and Innovation, Portugal

arliamentary Office for Evaluation of Scientific and

for Technology Assessment TA-SWISS, Switzerland

Appendix II: List of participants

- Adomenas, Mantas Member of the Lithuanian Parliament (Lithuania)
- Almeida, Mara Technology Institute of Biology and Chemistry (ITQB) (Portugal)
- Antoine, Michel Deputy Director of OPECST (France)
- Barland, Marianne Norwegian Board of Technology (Norway)
- Bellucci, Sergio Director of TA-SWISS (Switzerland)
- **Bijker, Wiebe** Professor at Maastricht University (Netherlands)
- Botines, Mireia Canals Member of the Parliament of Catalonia (Spain)
- Brandão Moniz, António Nova University of Lisbon (FCT-UNL)/GrEAT (Portugal)
- Brunet, Sébastien Walloon Institute for Evaluation, Prospective and Statistics (Belgium)
- **Burchardt, Ulla** Technical University of Dortmund (Germany)
- Bütschi, Danielle TA-SWISS (Switzerland)
- **Caraça, João** Director of Calouste Gulbenkian Foundation-Delegation in France (Portugal)
- Claverol, Enric CEO of Catalan Foundation for Research and Innovation (FCRi) (Spain)
- **Collins, Aine** Member of the Irish Parliament (Ireland)
- **Chobanova, Yordanka** Advisor to the Bulgarian President (Bulgaria)
- **Chonkova, Blagovesta** Applied Research and Communications Fund (ARC) (Bulgaria)
- **Cope, David** Foundation Fellow, Clare Hall, University of Cambridge (United Kingdom)
- Correia de Campos, António Member of the

European Parliament, STOA Chairman (Portugal)

- Dahl, Jens Henrik Thulesen Member of the Danish Parliament (Denmark)
- **Damianova, Zoya** Applied Research and Communications Fund (ARC) (Bulgaria)
- **de Belém, Maria** Member of the Portuguese Parliament (Portugal)
- **Deimek, Gerhard** Member of the Austrian Parliament (Austria)
- **Delvenne, Pierre** SPIRAL Research Centre, University of Liège (Belgium)
- **Domínguez Garcia, Ferran** Lawyer at the Parliament of Catalonia (Spain)
- **Duarte, Rui Pedro** Member of the Portuguese Parliament (Portugal)
- Enzing, Christien Technolopolis Group (Netherlands)
- Fitzgerald, Ciara University College Cork (Ireland)
- Fodor, Katalin Hungarian Academy of Sciences (Hungary)
- Fried, Judit Mosoni –Hungarian Academy of Sciences (Hungary)
- Gadjuskova, Alena First Vice-President of the Senate, Parliament of Czech Republic (Czech Republic)
- **Gesthuizen, Sharon** Member of the Dutch Parliament (The Netherlands)
- Gonçalves, Maria Eduarda Higher Institute of Labour and Enterprise (ISCTE-IUL) (Portugal)
- **Grunwald, Armin** Director of the Office of Technology Assessment at the German Bundestag (TAB) and of the Institute for Tech-

nology Assessment and Systems Analysis (ITAS) (Germany)

- Gutzwiller, Felix Member of the Swiss Parliament (Switzerland)
- Hahn, Julia Institute for Technology Assessment and Systems Analysis (ITAS) (Germany)
- Havas, Atilla Institute of Economics, Centre for Economic and Regional Studies, Hungarian Academy of Sciences (Hungary)
- Hebáková, Lenka Technology Centre ASCR (Czech Republic)
- Heijs, Francien Counsellor/Permanent Representation of the Netherlands at the European Commission
- Hennen, Leonhard Institute for Technology Assessment and Systems Analysis (ITAS) (Germany)
- João, Odete Member of the Portuguese Parliament (Portugal)
- Kaźmierczak, Jan Member of the Polish Parliament (Poland)
- Kazecky, Stanislav Ambassador of Czech Republic in Portugal
- Klüver, Lars Director of the Danish Board of Technology Foundation (Denmark)
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- Krom, André Rathenau Institute (Netherlands)
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- Leichteris, Edgaras Knowledge Economy Forum (KEF) (Lithuania)
- Lichtenecker, Ruperta Member of the Austri-

an Parliament (Austria)

- Longet, René Sustainability Expert (Switzerland)
- Maia, Maria João Nova University of Lisbon (FCT-UNL)/GrEAT (Portugal)
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- Müri, Felix Member of the Swiss Parliament (Switzerland)
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- Seabra, Miguel President of the Foundation for Science and Technology (Portugal)
- Sonka, Jaroslav Advisor, Senate of Parliament of Czech Republic (Czech Republic)
- Staman, Jan Director of the Rathenau Institute (Netherlands)
- **Tennøe, Tore** Director of the Norwegian Board of Technology (Norway)
- **Tiihonen, Paula** Council of the Committee for the Future (Finland)
- Vähämäki, Ville Member of the Finnish Parliament (Finland)

- **van Est, Rinie** Rathenau Institute (Netherlands)
- **Veloso, Francisco** Dean of Católica Lisbon School of Business & Economics (Portugal)
- **von Schomberg, René** DG Research and Innovation, European Commission, in personal capacity (Belgium)
- Zellweger, Eric Evaluanda (Switzerland)
- **Zlatuska, Jiri** Chairman of the Committee of Science, Education, Culture, Youth and Sports, Parliament of Czech Republic (Czech Republic)

