Parliamentary Technology Assessment in Europe

An overview of 17 institutions and how they work

EPTA

European Parliamentary Technology Assessment

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PARLIAMENTARY TECHNOLOGY ASSESSMENT IN EUROPE

PREFACE

Technology is at the heart of our societies. It shapes and defines the way we live. On the one hand, new and innovative technologies have a tremendous positive impact to improve our welfare, security and productivity. On the other hand, they create severe problems such as pollution and environmental degradation, health hazards or risks of catastrophic events.

It is therefore not surprising that science and technology play a crucial role in many political debates and decisions today. Which energy technologies need to be developed – and how can emerging technologies be supported to transform our energy systems in a sustainable way? Do we want to invest in geo-engineering technologies to stabilise the earth's climate? Will technological advances in medicine be a driver for rising costs or an opportunity for personalised health care and cost savings for the welfare systems? How can we seize the societal and economic opportunities of innovative information and communication technologies and at the same time address the risks of critical infrastructure failure and keep privacy issues at bay? How do ethical considerations and international humanitarian law relate to the procurement of unmanned aircraft armed for combat?

Dating back to the 1970s, Parliamentarians in many countries started to feel the need for balanced, comprehensive and independent information on science and technology issues in order to be able to respond to questions like these in an appropriate way. This was the starting point for the establishment of a number of Parliamentary Technology Assessment (PTA) units throughout Europe, with the overarching idea to strengthen the role of parliaments in the political arena.

Parliamentary TA has been institutionalised in many different ways: ranging from permanent parliamentary committees for TA, separate TA units as part of the parliamentary administration to independent institutions with a mandate to serve as a permanent consulting institution for Parliament.

Until now, we have lacked a comprehensive overview of how exactly these different institutions are set up and how they work. This publication is intended to fill this gap. All chapters originate from the different institutions themselves, after an initiative and coordinated by the Office of Technology Assessment at the German Bundestag (TAB), which held the EPTA presidency in 2011.

ABOUT EPTA

The European Parliamentary Technology Assessment network (EPTA) is currently composed of 14 full members and 4 associate members. The members of EPTA are European organisations that carry out TA studies on behalf of parliaments. EPTA aims to advance the establishment of technology assessment as an integral part of policy consulting in parliamentary decision-making processes in Europe, and to strengthen the links between TA units in Europe.

The EPTA network was formally established in 1990 under the patronage of the President of the European Parliament, Mr Enrique Baron Crespo. The network has a light structure, guided by the EPTA Council and by meetings of the Directors of the EPTA partner organisations.

The EPTA Council is the steering committee of the EPTA network, and consists of members of Parliament or representatives of the advisory boards of the respective EPTA organisation. The council decides on organisational matters such as co-operation within the network and the status of members and associates.

The presidency of EPTA moves each year. The tasks of the EPTA member organisation holding the presidency are to coordinate the EPTA network activities and to host the annual EPTA Conference, Council Meeting and Directors' meeting.

EPTA MEMBER ORGANISATIONS (2012)

- Scientific and Technological Options Assessment (STOA), European Parliament
- Teknologirådet – Danish Board of Technology (DBT)
- Tulevaisuusvaliokunta – Committee for the Future, Finnish Parliament
- Instituut Samenleving en Technologie (IST) – Institute Society and Technology, Flemish Parliament
- Office Parlementaire d'Evaluation des Choix Scientifiques et Technologiques (OPECST) – Parliamentary Office for Evaluation of Scientific and Technological Options, French Parliament
- Büro für Technikfolgen-Abschätzung beim Deutschen Bundestag (TAB) – Office of Technology Assessment at the German Bundestag
- Committee of Research and Technology Assessment (GPCTA), Greek Parliament
- Comitato per la Valutazione delle Scelte Scientifiche e Tecnologiche (VAST) – Committee for Science and Technology Assessment, Italian Parliament
- Rathenau Instituut – Rathenau Institute, Netherlands
- Teknologirådet – Norwegian Board of Technology (NBT)
- Zentrum für Technologiefolgen-Abschätzung – Centre for Technology Assessment at the Swiss Science and Technology Council (TA-SWISS)
- Parliamentary Office of Science and Technology (POST), United Kingdom
- Consell Assessor del Parlament sobre Ciència i Tecnologia (CAPCIT) – The Advisory Board of the Parliament of Catalonia for Science and Technology
- Utskottsavdelningen – The Parliamentary evaluation and research unit, Swedish Parliament

ASSOCIATE MEMBERS

- Parliamentary Assembly of the Council of Europe (PACE), Strasbourg
- Institut für Technikfolgenabschätzung (ITA) – Institute of Technology Assessment, Austria
- Belgian Federal Science Policy Office (belspo – formerly Belgian Federal Office for Scientific, Technological and Cultural Affairs [OSTC]), Belgium
- Biuro Analiz Sejmowych (BAS) – The Bureau of Research, Polish Parliament
- U.S. Government Accountability Office (GAO), United States of America

CONTENT

CATALONIA – THE ADVISORY BOARD OF THE PARLIAMENT OF CATALONIA FOR SCIENCE AND TECHNOLOGY

The Advisory Board of the Parliament of Catalonia for Science and Technology (CAPCIT by its abbreviation in Catalan) was set up in 2008 by the Parliament of Catalonia. CAPCIT provides a forum in order to present the members of the Parliament of Catalonia with the technology assessment (TA) tasks conducted by several Catalan scientific and technical institutions. CAPCIT aims to coordinate all information and counseling required by the Parliament of Catalonia in terms of science and technology.

The Parliament of Catalonia has placed major emphasis on scientific and technical issues and it has cooperated with several science and technology dissemination and research institutions. Even so, CAPCIT is the first scientific and technical advisory body to be set up directly by the Parliament of Catalonia. The Parliament of Catalonia is the only parliament in Spain to have a scientific and technical advisory body. Accordingly, there is no analogous technology assessment (TA) body attached to the Spanish Parliament or indeed to any of the other autonomous regional parliaments.

INSTITUTIONALISATION

CAPCIT is a body attached to the Parliament of Catalonia; nonetheless, it bears a nature, structure and undertakes duties that make it stand out from the other bodies of the Parliament of Catalonia. CAPCIT is a mixed body, composed of a total of 18 members as follows:

- 9 are members of the Parliament of Catalonia: 6 Members of Parliament (MPs) are appointed, one for each of the six parliamentary groups represented in the Parliament of Catalonia; 2 MPs are members of the Board of the Parliament of Catalonia, as well as the president of the Parliament, who also holds the presidency of CAPCIT.
- 9 are representatives from the main scientific and technical institutions of Catalonia: the Institute for Catalan Studies (IEC) with 3 representatives; the Catalan Foundation for Research and Innovation (FCRI, 2 representatives); the Catalan Council for Scientific Communication (C4, 1 representative), and finally, the Catalan Public University Association (ACUP, 3 representatives).

The IEC is the scientific academy of Catalonia and also the academy for the Catalan language. The FCRI is an institution whose goal is to support and promote research and innovation. C4 is devoted to scientific dissemination. And ACUP's main purpose is to be the principal voice of the universities of Catalonia.

ORGANISATION

The staff working for CAPCIT is limited. The preparation of meetings as well as other administrative tasks and services are carried out by officials from the Parliament of Catalonia. In particular, the secretary of CAPCIT is one of the lawyers for Parliament. On the other hand, once a decision is made within CAPCIT for one of the scientific and technical institutions to be charged with drafting a report, said institution will draw on its own staff and resources.

FINDING TOPICS

CAPCIT is the body charged with discussing and making decisions on its working plan and the issues about which it is necessary to prepare technology assessment (TA) reports. Therefore, not only politicians decide what issues must be worked on and what issues need to be addressed in a report, the members of the scientific and technical institutions are also involved from the outset on choosing the issues and giving advice on the suitability of devoting time and resources to specific topics. Furthermore, the following bodies may request CAPCIT to work on a particular topic: the Board of the Parliament of Catalonia and its committees.

Once CAPCIT decides that it is necessary to address a particular topic or the issue has been put forward to the body by the Board of the Parliament of Catalonia or any of the parliamentary committees, a decision needs to be made as to who shall be responsible for drawing up the report. The various alternatives are as follows:

- One of the scientific and technical institutions represented in CAPCIT should prepare the report.
- Preparation of the report should be commissioned to a different scientific and technical institution and proceedings will be initiated to appoint said institution.

WORK PROCEDURES

The Parliament of Catalonia has developed an awareness of the fact that in the age we live in, parliaments are not familiar with what is the most suitable way to provide support to scientific and technical innovations, and oftentimes they do not realise all the implications posed by the current scientific and technical revolution.

In this sense, CAPCIT has the following goals:

- Contributing to the improvement of the scientific and technical knowledge of the Parliament and disseminating it among Catalan society.
- Channelling participation from the main scientific and technical institutions when it comes to shaping the will of the Parliament in these spheres.
- Cooperating with institutions, bodies, professional associations, universities and other organisations and institutes that operate in the fields of science and technology as well as coordinating with them.

- Promoting shared responsibility with regard to public science and technology policies.

The principle for all actions undertaken by CAPCIT is founded on fostering diversity in opinion and scientific and technical alternatives in order to ensure the consultancy provided is neutral, objective and independent.

TOPICS

Generally speaking, the material working fields of CAPCIT are as follows:

- Science, in the broadest sense
- Technology, the Internet and communications
- Bioethics and health
- Environment and energy
- Dissemination and education in the above spheres

Since its inception, CAPCIT has worked on the following areas:

Genetically modified organisms (GMOs or transgenic)

A popular legislative initiative was presented in the Parliament of Catalonia which sought to ban genetically modified crops. CAPCIT decided to call for three reports on the topic from various scientific institutions represented on CAPCIT prior to discussing the issue in the plenary session of the Parliament of Catalonia.

Human papillomaviruses

Proposals had been submitted in the Parliament of Catalonia to restrict vaccinations for this virus and more information was sought on the issue before making a decision.

Nanotechnology

In this case the aim was to turn to good account the work being conducted by the Catalan Foundation for Research and Innovation and said foundation was asked to present its work to CAPCIT.

TARGET GROUPS

CAPCIT is a specialist body of the Parliament of Catalonia, though its work does not merely affect the 9 MPs who are among its members. The counseling given on scientific and technical issues and the gathering of information concerns all the bodies of the Parliament of Catalonia and their members. Accordingly, CAPCIT distributes the reports prepared by the various scientific and technical institutions among all parliamentary groups who are then required to forward them to the MPs. Likewise, depending on the topic, CAPCIT will send its reports directly to the respective competent parliamentary committees. In a case such as the one relating to the reports on genetic engineering, it was deemed pertinent to forward the reports

to the association promoting the popular legislative initiative which collected signatures to call for genetically modified crops to be banned.

COMMUNICATION AND PUBLICATIONS

As mentioned, its reports are not published; rather, they are distributed, unless the scientific and technical institution that prepared them undertakes the task of publishing them. Along these lines, the Catalan Foundation for Research and Innovation published its report on nanotechnology which can be viewed at the following link:
www.fcri.es/descarregues/2009_8_7_informe_nanotech_cata la.pdf

STATUS QUO AND THE WAY AHEAD

One of the main challenges facing CAPCIT is to firmly establish itself as a body of the Parliament par excellence. The regularity of the institution's meetings and the number of issues it deals with will depend primarily on the interest shown by the bodies and the members of the Parliament. Therefore it is a constant challenge for CAPCIT to maintain a high level of familiarity among MPs and to increase their interest in CAPCIT's work. This is especially important in the period after an election, because new MPs have to be familiarized with CAPCIT and its work. Another of the challenges facing CAPCIT is to set out a clearer definition of the role to be played by Catalan scientific and technical institutions in its meetings and in the preparation of the reports they draw up. One of the perceived strengths is for the various institutions to provide their opinion on the topics to be addressed; even so, when it comes to choosing the working issues it should not be overlooked that the decision-making must be conducted from a political standpoint to a certain degree.

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DENMARK – THE DANISH BOARD OF TECHNOLOGY FOUNDATION

The full name of the Danish Board of Technology (DBT) is the Danish Board of Technology Foundation – Fonden Teknologirådet. DBT aims to further the technology debate, assess technological impacts and options and advise the Danish Parliament, the Government and other political decision-makers in matters pertaining to technology.

ORGANISATION

The Danish Board of Technology is a non-profit, common good, corporative foundation, established in the course of the abolishment of the former Danish Board of Technology by June 20, 2012.

A corporate foundation is in Denmark a foundation, which bases its income on commercial activities and uses the revenue for common good purposes. Before the establishment of the foundation the Danish Board of Technology was a public, independent institution established by the Danish Parliament (the Folketing) under the Board of Technology Act No. 375 of 14 June 1995. The first Board of Technology was set up as a time-limited statutory body in 1986 and replaced by the Board (Teknologirådet) on 31 July 1995. The abolishment of the DBT in 2012 triggered a company take-over into the foundation on June 20, 2012.

The DBT was brought into being with three functions in mind. First, it was expected to disseminate knowledge about technology, its possibilities and its effects on people, on society and on the environment in order to support the level of knowledge and the debate in society. Second, it should support the work of Parliament by bringing forth visions, assessments and inspiration for political action. And third, there was an expectation that the Board should build its work on the experiences with action research made in the social sciences during the end of the 1970's and the beginning of the 1980's. So, DBT was born with expectations of serving Parliament, the public discourse and the actors involved in technology policy-making.

The DBT Foundation will build on this historical background and is expected to supply it with two new components.

- Other political decision-makers than the Danish Parliament are presumed to receive more focus from the DBT in the future because of the wide-spread influence on technology decisions in modern societies.
- The DBT Foundation expects to make use of its TA methodologies in areas, where the technology component of the problem is less dominating.

As a consequence of this development, the DBT Foundation makes use of the term Policy-oriented TA as a core function of its work. Parliamentary TA is an important part of this wider concept of TA.

The relation to the Danish Parliament is being processed at the time of writing. However, the Danish Parliament's Committee for Science, Innovation and Higher Education is expected to

point out two members of the Board of Representatives of the DBT Foundation. It is expected as well that an evaluation will take place in 2013, which will make a basis for clarifying the longer term relation between the Parliament and the DBT.

The DBT comprises a Board of Governors, a Board of Representatives, a Director and a Secretariat.

- The Board of Governors consists of seven members, including a chairman. The Board of representatives appoints two members. The employees appoint one member among their midst, and one member who cannot be an employee. The former Board appoints two members, plus one member after consultation of EPTA or a comparable relevant international organisation. It is being clarified at the time of writing if the Parliament is going to appoint one member.
- The rules for setting up the Board of Representatives are being laid out at the time of writing.
- The Director is employed by the Board of Governors. She/he takes part in and can speak at the meetings of the Board of Governors, but cannot vote.
- The Secretariat carries out the projects of the DBT and consists of 9 project managers (scientific staff), 2 project secretaries, 4 administrative staffers and 6–10 project employed assistants – mostly students.

FINANCES

As a corporate foundation, DBT carries out activities financed by third party funds. These have until 2012 mainly come from municipalities, regions, governmental agencies, the EU Commission and the European Parliament, but it is expected that the range of financial partners will expand into charity foundations, financing consortiums of societal actors and the Danish Parliament. The yearly turnover is expected to be around 9 million DKK (1,2 million Euro in 2012.

FINDING TOPICS

The search for topics will be made in close cooperation with the Board of Representatives and a wider network of interested parties. »Thematic meetings« will be made, in which important projects are identified, cooperation is established, and a financial background is being sought for.

The DBT foundation will initiate projects on demand from external actors, and may establish companies, which can focus on certain topical/business areas. It is crucial for the DBT Foundation that such external funding can be established without compromising the independency of the DBT, which will be managed by firstly, a set of clear rules for keeping projects at »arms' length« from those who pay, and second, to keep certain business areas separate in their own companies if needed.

APPROACHES/WORK PROCEDURES

DBT conducts technology assessments with a view to generating debate and clarification among the target groups – these being politicians, industry, NGOs, experts, citizens, etc. – depending on the issue at stake. This also includes groups in society which do not necessarily already see the need of debating technology.

To assess the functionality of actual technologies is not the task of DBT. Instead the focus must be on opportunities for and impacts on people, the environment and social conditions. The objective is to clarify dilemmas and conflicts. This does not always mean that technology assessments have to conclude in recommendations for a solution; technology assessments may provide knowledge, identify joint views, conflicts and options as a step towards finding a solution.

DBT draws on the best available expertise – in the widest sense – and often across professions and sectors. Expertise may be found among the traditional academia, but it may also be found among stakeholders, users, consumers, and lay people. This wide concept of expertise ensures that many types of knowledge and different values and interests are represented in the assessments.

METHODS

DBT considers it an essential task to contribute to the development of methods for assessing technology, especially in connection with methods involving the citizens, users and employees – those affected by the technology in question. DBT applies different methods for assessing technology:

- Experts may conduct analyses which offer an overview of the issues. If experts are requested to make assessments, DBT normally makes certain to consult several experts with different approaches, possibly by establishing an interdisciplinary working group.
- Citizens may formulate objectives, visions, requirements and needs. This can be facilitated by having participants criticize existing conditions and formulate visions and actions which could help solving problems. Or, a panel of citizens might question a panel of experts at a conference and prepare a final document presenting requirements and formulating objectives for the applications of a technology. Scenario workshops and consensus conferences are examples of such methods.
- Technology assessment may also present information to the participants to give them an opportunity to debate an issue, thereby providing them with a background for making their own assessments. Thus, education of the general public could be considered a method of promoting the population's own opportunities for assessing technology.

PROJECTS 2011

The 2011 work plan of DBT includes the following issues on which projects are initiated:

- Energy producing buildings
- Citizens' engagement in energy supply and consumption
- Harmful chemicals
- Denmark as a pioneering country – responsible innovation
- Long range waste management strategy – from waste to resource
- Privacy protection in the »Internet of things«

Besides, DBT is working on externally financed projects, for example:

- PACITA – EU project aiming at capacity building on TA in Europe. DBT is coordinating the project
- DESSI – development of a decision support system on security investments. EU project, DBT as coordinator.
- 5 simultaneous Citizen Summits on the future health care system, arranged together with the 5 regions in Denmark.
- A Citizen Summit on the Danish biodiversity action plan, arranged with the Ministry of Environment
- Involvement of employees in welfare technology innovation – made for the Danish Welfare Fund.
- BaltCICA – involvement of stakeholders and citizens in strategizing on increased water levels. EU project, involving the countries around the Baltic Sea.

TARGET GROUPS

The target groups are defined for each topic as part of the methodological choice. Methods and communication means are chosen to involve those actors who can make change. This often involves Parliament as target group together with other important actors.

- The *expert communities* may be target groups when the topic involves new orientation of research and innovation, or if research ethics (responsible research and innovation) may be of importance. There may be a need for bridge-building between academic communities, or it may be good to introduce self-reflexion among scientists on the societal impact of their research. Often this may be facilitated by involving the experts directly in the assessments, thereby making the assessments and effectively communicating them at the same time.
- *Stakeholders* may be very important actors if change is going to be induced. It may be that different stakeholders are blocking each other, thereby inhibiting the necessary change. Or, stakeholders may act on very different kinds of knowledge from which they define their opposing positions. Mediation and knowledge sharing therefore may be components in the involvement of stakeholders. Stakeholders are strong communicators to policy-makers if they back up the assessments and often they may even be able to induce change directly through their strong networks.

- *Citizens* can be important target groups for technology assessment, but cannot be reached directly because of the limited resources available. Therefore, citizens mainly can be reached through the media, which makes the press an important primary target group.
- *Political decision-makers* are most often a primary target group because of the importance of legislation in many technology fields, and because of the agenda-setting function of Parliament. In a broader sense, political decision-makers (region, municipalities) are important for administrative policy-making on environment, health, education, infrastructure etc. Accordingly, DBT considers all levels of political decision-making when selecting target groups.

DBT separates between »need-to-know« and »nice-to-know« target groups. The strategy for needs-to-know is to establish direct collaboration (involvement) with the target groups around the assessment, since that ensures the optimal communication situation. Nice-to-know target groups are mostly reached through workshops, conferencing, publications, newsletters and the press.

COMMUNICATION AND PUBLICATIONS

DBT communicates and co-operates directly with the relevant parliamentary committees who seek advice on examining a specific subject. This advice can consist of answering specific questions from members of parliament, making information meetings for committees, arranging hearings for parliamentary committees, or providing an issue of the briefing note »From the Board to the Parliament«.

DBT issues a range of publications with a view to stimulating debate on technology among them reports, books, newsletters, booklets and pamphlets. The e-magazine TeknologiDebat contains news stories, background information, articles and debates, all primarily related to the projects of DBT.

The website www.tekno.dk is a very important communication tool for DBT. It has around 1 million visits a year and some publications are downloaded at figures exceeding 250.000. The website delivers all publications of DBT, pages on all projects, podcasts from conferences, hearings, workshops etc., and a web-version of the eMagazine TeknologiDebat.

STATUS QUO AND THE WAY AHEAD

The work of the DBT is generally highly appreciated by Danish Members of Parliament (MPs) and increasingly by politicians in the regions and municipalities. However, Denmark has, through the last 10 years, been characterized by a strong divide between left/right in politics – often referred to as »block politics«. This has decreased the level of dialogue and common actions across the parliamentary room, and accordingly decreased the call for independent assessments. This tendency has been very clear with regards to a remarkable decrease in the call for parliamentary hearings during the last 5 years.

The change of the DBT into a corporate foundation needs to be seen in the light of this contemporary political situation. It will therefore be very important for the parliamentary TA function of the DBT Foundation that a closer relation between the single committees and the DBT is developed during 2013–2014.

Internationalisation of nearly all aspects of technology development and regulation is a tendency that has been accelerating very strongly through the last decade. DBT sees it as a main challenge to find ways for TA to keep up with this trend and be able to assess technology at all relevant policy levels. Some actions taken by DBT, such as the World Wide Views on Global Warming, the lately finished WWViews on Biodiversity, and the coordination of PACITA, indicates the beginning of a future, in which the Board will see internationalisation as a main challenge and a main field of activity. Increasing synergy between TA units across Europe and across the world is seen as a must for the future.

The new media reality is a challenge that needs to be confronted. Information sources become diffuse, journalism becomes more popular and less deep, the written media loses terrain, etc. TA needs to find its way in this new media world. TA is important, focuses on determining issues for society, has stories to tell and conclusions to discuss – so, the content is there to be communicated. The challenge is to redirect the communication efforts into new and more effective modes in the new media picture. It is a matter of strategy and of resources as well.

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EUROPEAN PARLIAMENT – SCIENCE AND TECHNOLOGY OPTIONS ASSESSMENT

Many of the issues coming before the European Parliament (EP) nowadays have a scientific or technological dimension to them. Technological and scientific advances lie at the heart of economic growth, and it is necessary to understand the impact of these technologies and how to best support scientific and technological innovation.

In this context, there is a growing need for legislators and policy-makers at national and European level to rely on independent, impartial and accessible information about developments in science and technology (S&T), the opportunities they offer, but also the risks they entail and their ethical implications.

STOA' S MISSION AND WORKING METHOD

The launch of STOA (Science and Technology Options Assessment), in 1987, was the European Parliament's response to this need.

The main components of the STOA's mission are (STOA Rules[1], Article 1):

- providing Parliament's committees and other parliamentary bodies concerned with independent, high-quality and scientifically impartial studies and information for the assessment of the impact of introducing or promoting new technologies and identifying, from the technological point of view, the options for the best courses of action to take;
- organising forums in which politicians and representatives of scientific communities or organisations and of society as a whole discuss and compare scientific and technological developments of political relevance to civil society;
- supporting and coordinating initiatives to strengthen parliamentary technology assessment activities in the Member States of the European Union, including creating or enhancing parliamentary technology assessment capacities in European countries, especially new Member States.

These components are fulfilled with generally recognized success through:

- Projects ranging over several S&T areas and executed by eminent scientific institutions, which have provided the MEPs and the parliamentary committees with insights into medium to long-term, complex interdisciplinary issues related to the impact of S&T developments on society.
- Several projects, in the fields of Information and Communication Technologies (ICT), sustainable energy sources and future energy scenarios, alternative transport technologies and the future of European transport, converging technologies and human enhancement,

1 www.europarl.europa.eu/stoa/webdav/site/cms/shared/1_about/rules/200911/rules04may2009_modified_11nov2009_en.pdf

nanotechnology, life sciences for human well-being and intellectual property rights were concluded and the respective studies were published since 2006.

- Conferences, seminars and workshops organised by STOA, alone or in collaboration with external organisations, fostering a closer interaction between policy-makers, scientists and society in its multi-faceted components.
- Among these, the Annual Lecture, the pinnacle STOA annual event, which in 2009 hosted Sir Tim Berners-Lee, the inventor of the World Wide Web, in 2010 featured distinguished speakers on Electromobility (Shai Agassi, Founder and CEO of »Better Place«), Atmospheric Chemistry and Climate Change (Paul Crutzen, Nobel Prize in Chemistry 1995) and the Methanol Economy (George Oláh, Nobel Prize in Chemistry 1994), and in 2011 featured, among others, J.A. Allan, Stockholm Water Prize 2008, P.A. Wilderer, Stockholm Water Prize 2003 and M. Wackernagel, Founder and Executive Director of Global Footprint Network, who addressed the topic »Sustainable management of natural resources«. The 11th Annual Lecture (27 November 2012) will feature eminent scientists speaking about recent developments in Elementary Particle Physics at CERN, especially at the Large Hadron Collider.
- The participation of STOA, beyond the premises of the EP, in key events at the European and global level, such as the EuroScience Open Forum (ESOF 2008 in Barcelona, 2010 in Turin and 2012 in Dublin), the Science and Technology in Society (STS) forum in Kyoto, BioVision – the World Life Sciences Forum in Lyon, and the Internet Governance Forum (IGF).
- The active role STOA has continued to play within the European Parliamentary Technology Assessment (EPTA) network, contributing to the consolidation and development of Parliamentary Technology Assessment (PTA), as part of a democratic governance culture.

BRIEF STOA HISTORY

In October 1985, the EP adopted a report »on the establishment of a European Parliament Office for Scientific and Technological Option Assessment«, which stressed »the particular needs of the standing committees and political groups in technical and political decision-making, which can be met only by an autonomous technology assessment office« and proposed »that a European Parliament office for scientific and technological option assessment should be set up ... to coordinate assessment work and award external contracts in support of its work«.

Following a decision by the EP Bureau in June 1986, STOA was officially launched in March 1987 as an 18-month pilot project, at the end of which, in September 1988, the EP Bureau authorised STOA to continue its work on a permanent basis, on condition that it make its services available to all standing parliamentary committees. As such, STOA celebrated its 20 years of existence in 2007 with a major exhibition (»The STOA Experience«) during the EP plenary session in Strasbourg in June of that year.

STOA's activities were initially governed by a series of Bureau Decisions, which were assembled in the Consolidated Internal Rules of Procedure of STOA and approved by the EP Bureau on 25 October 1999. On 13 January 2003, the EP Bureau adopted STOA Rules defining

the nature of STOA, describing STOA bodies and setting the framework conditions for STOA projects. These rules were in force until the end of the 1999–2004 legislative period.

In 2009, the STOA Rules were further modified, based on proposals submitted by the EP Vice-Presidents responsible for STOA. The main purpose of these modifications was to add a European dimension to STOA's mission and include an additional criterion for selecting STOA projects in alignment with the priorities defined by the STOA Panel, as well as to stipulate a second Vice-Chairman and simplify certain procedures.

GOVERNANCE, ORGANISATION AND RESPONSIBILITIES

THE STOA PANEL

The STOA Panel, which is an integral part of Parliament's structure, is politically responsible for STOA's work. It comprises 15 members with the right to vote:

- the Vice-President of Parliament with responsibility for STOA;
- 4 members appointed by the Committee on Industry, Research and Energy;
- 2 members appointed by the Committee on Employment and Social Affairs;
- 2 members appointed by the Committee on the Environment, Public Health and Food Safety;
- 2 members appointed by the Committee on the Internal Market and Consumer Protection;
- 2 members appointed by the Committee on Transport and Tourism;
- 2 members appointed by the Committee on Agriculture.

The members of the STOA Panel are appointed for a renewable two-and-a-half-year period. The Panel is reconstituted in the beginning and in the middle of each parliamentary term, following the appointment of its members by the six committees.

STOA BUREAU

The STOA Bureau runs the activities of STOA and prepares the Panel meetings. The STOA Panel in turn elects three members of the Bureau, the Chairman and two Vice-Chairmen. The Vice-President of the European Parliament responsible for STOA is *ex officio* also a member of the STOA Bureau.

STOA UNIT

STOA's operational responsibilities are with the STOA Secretariat, a unit within Directorate G (Impact Assessment and European Added Value) of the EP's Directorate-General for Internal Policies of the Union (DG IPOL).

IDENTIFYING TOPICS AND CONDUCTING ASSESSMENT AND ANALYSES

Applications to execute technology assessment projects or to organise workshops of a clearly scientific and/or technological character are submitted by the various parliamentary committees and by individual Members of the European Parliament and are discussed by the STOA Panel, in view of their possible adoption as STOA projects. The proposals are approved by the STOA Panel on the basis of the following criteria:

- the relevance of the subject to Parliament's work;
- the scientific and technological interest of the proposal;
- the strategic importance of the proposal and its alignment with priorities defined by the STOA Panel; and
- the availability of scientific evidence covering the same subject.

STOA remains sovereign in the final choice of subjects and the elaboration of the project specifications. In doing this, the Panel may accept, modify, merge or reject proposals submitted by committees or Members. The STOA Secretariat executes the decisions of the Panel with the assistance of external contractors who are selected based on the expertise needed by STOA and the financial regulation of EU institutions.

STOA's external contractors can be research institutes, universities, laboratories, consultancies or individual researchers contracted to help prepare specific projects. STOA signed in 2009 multi-annual framework contracts with expert consortia covering the delivery of technological and scientific expertise in a broad range of areas.

Once the projects are completed, but also when important interim results are obtained or when current events render some subjects politically interesting, STOA approaches the relevant committees and organises presentations by its experts. Similar presentations are also organised in the context of the STOA Panel meetings.

RECENT STOA PROJECTS AND WORKSHOPS

Projects were were recently completed on the following subjects:

- Nanosafety
- Technology options for urban transport
- e-Democracy
- Technology across borders
- Knowledge transfer from Public Research Organisations
- Bio-engineering in the 21st century: Making perfect life

In May 2010, the STOA Panel voted on a series of research priorities, reflected in large-scale projects currently being carried out on:

- Eco-efficient transport
- Sustainable management of natural resources
- Security of e-Government systems

New projects, largely along the lines of the above priorities, were launched in 2012 on:

- Potential and impacts of cloud computing services and social network websites
- Science Metrics: Measuring scientific performance for improved policy-making
- Technology options for feeding 10 billion people
- Methanol: A future transport fuel based on hydrogen and carbon dioxide?

Apart from workshops organised in the context of STOA projects, STOA has recently organised workshops on such subjects as the following:

- Education – a lifelong challenge for the brain (15 March 2011)
- CO_2: a future chemical fuel (22 March 2011)
- Ethical Issues of Emerging ICT Applications (31 March 2011)
- The importance of Astronomy (24 May 2011)
- A roadmap for ageing research (18 October 2011)
- Chemistry for a better life (9 November 2011)
- The Science of Innovation (28 February 2012)
- Human Enhancement – The Ethical Issues (26 April 2012)
- Synthetic Biology: New potentials for the European bio-economy (6 June 2012)
- Emerging and re-emerging infectious diseases (19 June 2012)
- Materials for the 2020 challenges (10 July 2012)
- Research symposium on digestive and liver diseases (18 September 2012)
- Improving research management for better research outcomes (10 October 2012)

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FINLAND –
THE COMMITTEE FOR THE FUTURE

INSTITUTIONALISATION

The Committee for the Future was established in 1993 from the very beginning as a committee in the Finnish Parliament. The creation at almost the same time of the Finland Futures Research Centre in Turku University and the Committee for the Future had the same motivation: to develop a national foresight system against the background of the recession that was afflicting Finland in the early 1990s. In the intervening period, thinking in relation to the future has become broadly and deeply rooted in Finnish society. The Finnish foresight system is of a versatility that is rare anywhere in the world.

Giving a standing committee within the Finnish parliamentary system a new, future-oriented role of this kind was not at all easy, for many reasons. What has been remarkable in light of this is that the initiative came from the legislators themselves.

Science, technology and creation of new concepts and ideas as well as revitalisation of institutions has been important, but so is the ability to recognise what will be permanent in the future and what ought to be.

ORGANISATION AND RESPONSIBILITIES

In 2000 Parliament decided to make the Committee a permanent Committee with the same high status as the other standing permanent committees.

The committee has meetings twice a week. 17 members of Parliament from all political parties sit around the same table in the committee room and their only task is think, discuss and decide on new things – on Futures as researchers of Future Studies would say. In the Finnish parliamentary system committee meetings are closed, so MPs are more free to discuss and look for common or different opinions. Anyway they share different kinds of problems and options of Futures in spite of being representatives from right to left and all between.

Its current tasks are (1) to prepare material to be submitted to the Finnish Parliament, such as government reports on the future, (2) to make submissions on future-related long-term issues to other standing committees, (3) to debate issues relating to future development factors and development models, (4) to undertake analyses pertaining to future-related research and IT methodology, and (5) to function as a parliamentary body for assessing technological development and its consequences for society.

All members of the Committee are MPs, and like most of the other standing committees it has 17 members. So, it neither concentrates on preparing legislation nor reviewing the government's annual budget proposal, but in other respects it resembles the other committees. What makes it different is the nature of its functions and its new fields of tasks. Its mission is to conduct an active and initiative-generating dialogue with the government on

major future problems and the means of solving them. Since the problems of the future and above all its opportunities, cannot be studied through traditional parliamentary procedures and work methods alone, the committee has been given the specific task of following and using the results of research. Indeed, the committee can be said to be making policy on the future, because its goal is not research but rather policy.

Because the Committee itself decides its modest annual research, printing and translation budget, research projects must be chosen, manned, timed and directed well. The Committee has an annual budget for the research projects and a permanent scientific expert who coordinates projects. All administrative costs are covered by Parliament's general budget.

FINDING TOPICS

Committee for the Future has the power set its own agenda. All topics are »own« except the so called »Future report« of the Government which is submitted from the Prime Minister's Office to the Parliament once during every 4 years election period. The powers of the Committee are adequate and very permissive. It would not be advisable to lose the character of a parliamentary think tank, which is both of a high standard and even unique in the world, by routinely accepting legal matters as the subjects of statements.

WORK PROCEDURES AND METHODS

It is important that the tasks with which the Committee has been entrusted have from the very beginning included methods of futures research. This will continue to be the foundation of high-quality futures work. In particular, at the beginning of each parliamentary term the new Committee must be given training to familiarize it with good work methods.

Deliberation of so-called own matters in a plenary session, as a topical debate on the basis of reports, is problematic, but so far the only way. A right to draft a report concerning own matters, along the lines of the model that applies to the Audit Committee, would strengthen deliberation as a normal plenary session matter. Another method that has been proposed is one in which the Committee would present joint long-term parliamentary initiatives, but this would blur the significance of both the Committee and the initiative institution.

The Prime Minister as the corresponding minister is the most appropriate choice. In accordance with the idea on which the Committee is founded, the broad scope of its tasks and a high level of Government-Parliament dialogue, the cabinet member with foremost responsibility must ultimately be the Prime Minister. Moreover the Prime Minister also chairs the Research and Innovation Council which facilitates again a broad dialogue.

Once during its term of office, the Government issues a report on long-term future prospects and the Government's targets. In accordance with the political system, it is the Prime Minister who chooses the theme. In order to promote regional debate, regional Future Forums are organised jointly by the Prime Minister's Office and Parliament on the subject matters of the report.

It would now appear to be the time for broad handling that covers a wide spectrum of sectors, for horizontal processing rather than special themes the Committee should once in a parliamentary term conduct a general exploration of the state of Finland and the related scenarios and/or futures map.

The Committee's intention during this parliamentary term is to create a pool of professor-level experts both from the Finland Futures Research Centre (which is an auxiliary unit of the Turku University) and other universities too. This university network is destined to provide assistance in conducting studies, and also to strengthen ties to the world of science

An increasing number of Regional Meetings have been arranged both with the Committee on its own and together with the corresponding ministry, i.e. the Prime Minister's Office. It participated successfully for four weeks in an open popular discourse on an education theme on the Internet. Systematic hearings to elicit the views of citizens would be important, but require a lot of resources. The Committee will support and participate if the Parliament makes a policy decision to hear the views of citizens on, for example, important major legislative projects. Modern media is used as much as possible. This development is intended to be continued. It will be possible to arrange new kinds of citizen involvement.

The Committee for the Future is not one of the most desired committees after a general election, but it has proved itself to be a good vantage point from which to follow changes in the world. A considerable proportion of ministers have been members of the Committee. In the period 2003–2007 the Committee's chair, Representative Katainen, was elected as the leader of the biggest opposition party, the National Coalition, and became Minister of Finance after the election. The Committee's report »A Caring, Encouraging and Creative Finland«, which appraised the information society, was incorporated, almost complete with name, into the Programme for Government. After the spring 2011 general election, Mr Katainen took the prime ministership. There are many other ex-Future-MPs in the new Government, even two other party leaders: Minister of Finance and chair of Social Democratic Party, Mrs Urpilainen, being one of the most important ones and Minister of Interior, chair of Christian Party, Mrs Päivi Räsänen.

TOPICS

In autumn 2011 the Committee for the Future held a number of hearings with tens of experts representing various sub-sectors of society. Based on these hearings, the Committee chose, at this stage, four areas of study for itself during the parliamentary term 2011–2014:

- sustainable growth
- an inspired society
- acquiring new knowledge, and
- can the welfare society endure?

The themes are chosen from the Committee's interests, but also to create a readiness to respond to the Government's report on the future (The Finnish sustainable development growth model in a changing world).

In addition, the Committee has been making preparations to revamp its work methods, i.e. has looked closely at how projects are implemented and how the effectiveness of activities is ensured. This theme was addressed from several different perspectives in autumn 2011: from the perspectives of direct democracy, social media and crowdsourcing, with a view to strengthening the formulation of the Parliament's futures-oriented policies as well as also from the perspective of rationalising the Committee's own work.

These objectives are being promoted by means of three themes that cut across several dimensions:

- Black Swans (with an open writing competition intended to elicit suggestions about surprises that will significantly change the future)
- Crowdsourcing (the Committee for the Future will increase its visibility in social media and develop participatory forms of action)
- Radical technologies (what will be the next technology waves?)

TARGET GROUPS

The Committee for the Future deliberates parliamentary documents referred to it and, when requested to do so, makes submissions to other committees on futures-related matters, which are included in their spheres of responsibility and have a bearing on development factors and development models of the future. The Committee conducts research associated with futures studies, including their methodology. The Committee also functions as a parliamentary body that conducts assessments of technological development and the effects on society of technology.

By this way The Committee is then bridging the Government, the Parliament and Finnish Civil Society. The Committee should once in a parliamentary term conduct a general exploration of the state of Finland and the related scenarios and/or futures map. Efforts are made to create joint steering groups with other committees and arrange joint evaluation seminars and also to devise streamlined methods for producing statements and comments. In accordance with the idea on which the Committee is founded, the broad scope of its tasks and a high level of Government-Parliament dialogue, the cabinet member with foremost responsibility is the Prime Minister, who also chairs the Research and Innovation Council.

Regional meetings alone and together with the corresponding ministry, i.e. the Prime Minister's Office, have been increased. During the current parliamentary term, especially the cooperation with the business world, municipal committees for the future as well as youth councils that have been stepped up will be continued. This theme (Open Committee) was addressed from several different perspectives in autumn 2011: from the perspectives of direct democracy, social media and crowdsourcing, with a view to strengthening the formulation of the Parliament's futures-oriented policies as well as also from the perspective of rationalising the Committee's own work.

COMMUNICATION AND PUBLICATIONS

See before. All reports are published in Internet and most of them also as books, especially those which are handled in the plenary session. Social media will be used in a totally new way during this period.

IMPACT

The most important impact is »having and using visionary power«. The committee for the Future is in the corn of political power. From the beginning the need for long-term examination of the future also at the core of democracy, i.e. in the parliamentary institution, has been recognised in the Finnish Parliament as being so important that there was a willingness to create a totally new institution specifically within the national legislature. Precisely for this reason, the Parliament has received a lot of international plaudits for its own innovation.

When it has worked well, the Committee's operational model has been almost an ideal way of creatively and critically combining scientific and technological information with a search for innovative new political solutions. The Committee has enjoyed fairly good success, because sufficiently different politicians with broad minds and an interest in the new have sought membership of it. What is very important is that the Committee contains, on the one hand, very experienced, inquisitive and bold politicians and, on the other, also ambitious »rising stars« with a thirst for knowledge. It is likewise important that they represent the Finns in all their diversity of education, from farmer to professor.

The second foundation stone for lasting success that can be pointed to is that the aim in the Committee's reports is to be thorough and scientifically critical rather than trying to please the public or voters with showily produced and light pamphlet-style publications. Lighter versions of reports have been needed for information purposes, but the serious and thorough way that science deals with phenomena has not been overlooked.

THE WAY AHEAD

The Committee for the Future is a think tank inside the Parliament.

As is the case everywhere in democracies, the division of labour within the political system means that the Government is a proactive political actor. What this means is that, taking the demands of the future into consideration, it makes proposals to the parliament, which in turn has the task of approving laws and the budget. The Government governs. The parliament can be active and a source of initiatives specifically in long-term futures policy and for this it needs an empowered and capable body that concentrates, with the aid of the methods of futures research, on these often difficult and complex matters.

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FLANDERS – INSTITUTE SOCIETY AND TECHNOLOGY

As a parliamentary technology assessment organisation, the Instituut Samenleving en Technologie (IST) supports the decision-making process of the Flemish representatives, with regard to science and technology policy. IST supplies knowledge about the underlying scientific foundations and it studies the social acceptance of new technologies. It makes recommendations on what *can* be done, rather than on what *should* be done. The Institute also communicates to a wider forum of stakeholders and citizens.

INSTITUTIONALISATION

The IST was founded by decree by the Flemish Parliament on 17 July 2000, as an independent, autonomously functioning organisation for technology assessment. At that time it was called viWTA (Flemish Institute for Science and Technology Assessment). After an evaluation in 2008, it has been renamed Institute Society and Technology.

As an autonomous institution associated with the Flemish Parliament, the Institute has its own executive board, which consists of 16 members. Eight of them are members of the Flemish Parliament, belonging to the various parties in the parliament. One of them will be appointed to the Presidency of the board. The other half is composed of experts from the Flemish scientific, technological, environmental and socio-economic communities.

The daily responsibility of the Institute is being held by the scientific secretariat. Besides a director and an administrative secretariat, the staff is composed of a small but thoroughgoing group of 4 up to 6 researchers and a communication manager.

FINDING TOPICS

The IST gears its activities to the needs of the Flemish Parliament and follows thematically the current scientific and technological trends, which are relevant for Flanders.

The Institute carries out regularly »trend watches«, to make an inventory of the current trends in the development of science and technology. Especially themes with a clear societal impact on Flemish areas of responsibility are taken into consideration. The trend watch inventory is subsequently fine-tuned in consultation with the other European TA institutions (the EPTA network), with the Flemish scientific and technological players, and with the responsible commissions within the Flemish Parliament. On this basis, the Institute defines its yearly working programme. Since its foundation, the Institute has dealt with quite a variety of issues, from »biotechnology«, through »mobility and use of energy« to »cyber bullying« and »nanotechnology«. Accordingly a broad range of methods and approaches is used. For certain issues, only a short, explorative analysis is adequate and sufficient. Others require in-depth research, including extensive participation of stakeholders and public.

WORK PROCEDURES/CONDUCT OF ASSESSMENTS AND OTHERS

IST has conducted research in a broad area of topics and issues related to a variety of technologies, from biotechnologies, through mobility technologies, energy technologies, information and communication technologies as well as nanotechnologies, and fertility technologies. The institute has applied a broad range of analytical and participatory methods and approaches: explorative survey studies, parliamentary hearings, theatre plays, essays, interviews with experts and stakeholders, retrospective trend analyses, consensus conferences, public forums, citizen conventions, technology festivals, didactical packages for scholars, among others.

TARGET GROUPS

The main target group of the IST is first and foremost the members of the Flemish Parliament. The Institute is aware of the fact that a TA project can only lead to the desired impact, if the political network and the general public are well informed and if the policy options are perfectly clear. Communication is paramount to achieve that goal, provided that

…it is tailored to the target group;

Scientific reports are relevant for scientists and for the knowledge building within the Institute. Nevertheless, to address specific target groups, including policymakers, specially adapted and attractive means of communication should be put into action.

…it joins reality;

It is key to communicate at the appropriate moment. As far as the content is concerned, communication should keep in touch with reality.

…it considers the media as partners;

Properly communicating with the media is crucial, not only with specialist journals or with the so-called quality newspapers, but also with the popular papers, magazines, radio, television, and on the internet. The media constitute a very important factor in raising public and political opinion.

…it is supported by the organisation as a whole;

The dissemination of the results of a TA research should not be limited to the director and the communication manager. It is the responsibility of every TA researcher to propagate the results of his or her project.

…it is a continuous effort.

The actual work only begins when a study comes to an end and the results are being published. TA will only have an impact if its results are continuously communicated and commented, in a way that appeals to people and makes it belong to various contexts. In other words, TA communication also takes place outside the offices and the meeting rooms.

COMMUNICATION AND PUBLICATIONS

Over the years, the IST has developed various communication products, including an electronic newsletter (e-zine), custom made publications (reports, dossiers, recommendations and facts in a nutshell), and the web site www.samenlevingentechnologie.be

THE WAY AHEAD

On October 24 2011, the Bureau of the Flemish parliament decided to cease the activities of IST by December 31 2012. The decision on the demise of IST was prepared by a political working group, which had been installed in November 2010 by the Bureau of the Flemish parliament in order to have a political evaluation of 3 out of 4 »paraparliamentary« institutes (the Flemish Peace Institute, the Children's Rights Commissariat and IST). In other words, this working group discussed on what could be the future of these institutes within the context of parliament. Representatives from all democratic political parties present in the Flemish parliament took part in this working group. In May 2011, the representative from the green party (Groen) decided to leave the discussions after a conflict on the objectives of this working group. The representative argued that the working group had too many prejudices and jumped too fast to closure conclusions for the different organisations.

In brief, the decision differentiates between TA advice function and TA research function of IST:

- Its TA advice function could be delegated to a committee that consists of parliamentarians and scientists. Reference is made here to the current Catalan PTA model, where the president of the parliament is also chairman of this committee.
- Its TA research function will disappear. The Flemish parliament does not see itself as having to play a direct role in financing research at universities or other research organisations. It based its decision on the premise that parliament cannot finance research: what can be done better elsewhere should be done there.

Parliament's decision leaves an opportunity for the Flemish government to take up the TA research and/or TA functions of IST.

Parliament's decision in October 2011 to close IST at the end of 2012 emphasized a period of significant uncertainty concerning the future of policy oriented technology assessment in Flanders and threatened to create an institutional vacuum for decision-supporting and participatory TA in Flanders. In the months following this decision, two organisations were identified by IST, the Flemish Parliament and the Flemish government which could potentially integrate the TA research function:

- the Flemish Council for Science and Innovation (VRWI)
- the Flemish Institute for Technological Research (VITO)

VRWI is the independent Flemish strategic advisory council that can act proactively or on request of the government and parliament for the policy areas science and innovation. VITO is an independent and customer-oriented research organisation that provides innovative

technological solutions and scientifically based advice. Hence, while the first is much more policy oriented with links to government and parliament, the latter is much more research oriented with links to academia, industry and government.

Several choices had to be made by the key players, i.e. the Flemish parliament and the Flemish government:

- Concerning the TA advice function:
  The Flemish parliament had to decide if and how it wanted to incorporate the TA advice function in its own activities. In the months following October 2011 it became soon clear that the initial suggestion to implement the introduction of the Catalan parliamentary TA model into the Flemish parliament was abandoned.
- Concerning the TA research function:
  The Flemish parliament's decision of October 2011 was clear: the parliament wished no longer to take up any role in TA research activities and asked the Flemish government whether it is interested in taking over TA activities of IST.

In July 2012, the Flemish government then took the decision to relocate the TA research activities to the Flemish Institute for Technological Research (VITO). This involves the transfer of a significant part of IST's budget from parliament to the government and the opportunity for the current TA practitioners at IST to start working at VITO.

For sure, parliament's decision to close IST has highlighted the need to reflect on the de- and re-institutionalisation process of policy oriented TA activities in Flanders. For months it was unsure whether such kind of activities would disappear or re-emerge in a different institutional context. The government's decision to integrate TA activities of IST in VITO offers a unique opportunity to tackle limitations of the (parliamentary) TA model that has been used in Flanders of the past 10 years. It is to be expected that new ways of linking and embedding TA expertise with other innovation stakeholders and discourses will be developed over the coming months and years. Expertise that has been built up by IST is useful in this matter but will also to be matched with the ever evolving science and innovation landscape. This includes:

- finding an effective balance between TA activities stimulating public discourses and supporting existing and new policy initiatives on science and technology issues,
- positioning TA in the Flemish innovation landscape as a visible knowledge actor that is a contact point for politicians, interested citizens and science, technology & innovation promoters,
- linking TA with other science and innovation discourses that are used in national and transnational policy areas, academia and industry, and
- constructing organised reflection on short-term, salient and immediately political/societal relevant issues and long-term, slow and »under the radar« collective interest goals.

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FRANCE –
OFFICE PARLEMENTAIRE D' EVALUATION DES CHOIX SCIENTIFIQUES ET TECHNOLOGIQUES

INSTITUTIONALISATION

Whereas science was long considered as a vehicle of knowledge, and not as the principle of an action, modern times have witnessed the development of sciences and technologies enabling mankind to act upon nature. However, in doing so, fresh problems and new concerns have arisen. From this observation was born the idea of technology assessment which appeared essential to scientific and political bodies. Mechanisms had to be put in place in order to control technical progress while, at the same time, anticipating its consequences.

In the early 1980's, during a number of debates such as the orientations concerning nuclear, spatial or cable programmes, the French Parliament came to the conclusion that it was unable to assess Government decisions on the major directions of scientific and technological policy. It therefore decided to establish its own structure of assessment: the Parliamentary Office for Scientific and Technological Assessment (Office Parlementaire d'Evaluation des Choix Scientifiques et Technologiques, OPECST).

The OPECST, which was set up by Law n° 83-609 of July 8, 1983, following a unanimous vote of Parliament, aims, within the terms of the Law, »to inform Parliament of the consequences of the choice of scientific and technological options, in particular, so as to enable it to make enlightened decisions«. To do this, it »collects information, launches study programmes and carries out assessments«.

ORGANISATION AND RESPONSIBILITIES

The OPECST is an unusual structure within Parliament: its members, who are appointed so as to ensure proportional representation of the political groups, belong both to the National Assembly and to the Senate. It is composed of eighteen MPs and eighteen Senators; each member may be appointed as a »rapporteur«. A rapporteur is an MP or a Senator in charge of writing a report on a given subject.

The OPECST is chaired alternately for a period of three years, by a member of either assembly. Internal rules stipulate that the First Vice-President shall belong to the other Assembly.

The OPECST acts as an intermediary between the political world and the world of research. It must listen to researchers and requests authorized opinions. In order to carry out its task, the OPECST is assisted by a *Scientific Council* reflecting the diversity of scientific and technological disciplines in its very composition, as it is made up of twenty-four leading figures selected on account of their expertise.

FINDING TOPICS

Matters may be referred to the OPECST by the *Bureau* of either Assembly (upon its own initiative, upon the initiative of the chairman of a political group, or upon the initiative of 60 MPs or forty Senators), or by a committee.

Until now, the topics dealt with have belonged to four main areas: energy, environment, new technologies and life sciences.

Some matters referred to the OPECST have been reexamined for several years, such as problems connected with the safety and security of nuclear installations. Others have required the updating of one of the OPECST's previous reports (development of the semiconductor sector, television with digital high-definition, high-activity nuclear waste, etc.). The renewal of referrals on such matters has enabled the OPECST to ensure a real follow-up of certain subjects.

WORK PROCEDURES AND METHODS

THE APPOINTMENT OF A RAPPORTEUR

Any matter referred to the OPECST leads to the appointment of one or more rapporteurs, exclusively selected amongst the members of the OPECST. Several study programmes have brought together an MP and a Senator.

THE FEASABILITY STUDY

Once appointed, the rapporteur first makes a feasibility study. This study aims at providing a snapshot of knowledge on the topic, determining possible research avenues, appreciating the possibilities of obtaining relevant results in the required time period and, last, determining the necessary means to start a study programme. The rapporteur then submits the conclusions of his feasibility study together with methodological remarks to the members of the OPECST. At that stage, he suggests either that the study should be closed, (this happens very rarely), or he proposes to modify the extent of the study (a study first dealing with biofuels was thus extended to prospects for development of non food agricultural products), or, much more frequently a study programme is set up that leads to the drawing-up of a report.

THE DRAFTING OF A REPORT

The rapporteur then goes ahead with hearings enabling him to gather, without exclusion, all opinions from concerned persons and organisations. He may also travel in France or abroad in order to inspect installations and firms connected with his work. Throughout his study, the rapporteur is assisted by a parliamentary civil servant and, if need be, by a study group made up of specialists from outside Parliament. He may also hire French or foreign free-lance experts and consultants for further investigation into specific items. He may likewise gather the opinions of trade unions, professional bodies, and organisations for the protection of the environment or consumer defence. However, the OPECST reports are not restricted to setting out the experts' points of view. Their conclusions are the work of Parliamentarians and may go

beyond merely informing, by including suggestions and recommendations. If the rapporteur deems it necessary, public hearings, open to the press, are organised to gather and confront the opinions of leading figures and organisations wishing to express themselves on the subject in discussion. The minutes of these hearings may then be annexed to the report.

THE RAPPORTEURS' POWERS

The OPECST rapporteur have identical powers to financial rapporteurs: they may therefore carry out direct investigations on any State Agency and have access to any available document, with the exception of those dealing with military matters or State security. In addition, in the event of difficulties encountered in exercising their mission, the OPECST rapporteurs may request to be given the prerogatives granted to parliamentary committees of inquiry.

THE PUBLICATION OF REPORTS

At the end of their work, the rapporteurs submit their draft report and their conclusions to the members of the OPECST. These conclusions are presented in such a way that they may be used directly for legislative work or budgetary discussion. Members of the OPECST must decide whether they publish these reports and all or part of the minutes of the hearings and the contributions by the experts. In this respect, the OPECST's decisions are mostly unanimous and the consensus of its decisions is one of the OPECST's main features.

The documents from the OPECST, which make up a special collection within all the parliamentary reports, are on sale at the »Boutique de l'Assemblée Nationale«, at the »Espace Librairie du Sénat« and at the Journal officiel, and are available on each Assembly website. Since its creation, the OPECST has published more than 90 reports.

TOPICS

RECENT REPORTS

- Nuclear safety, the scope of the nuclear safety, present and future outlook of the nuclear industry, by Messrs Christian Bataille, deputy and Bruno Sido, senator (13th legislature, December 2011).
- Innovation put to the test of fears and risks, by Messrs Claude Birraux and Jean-Yves Le Déaut, deputies (13th legislature, January 2012).
- The impact and challenges of the new diagnosis and therapeutic technologies for the brain, by Messrs Alain Claeys and Jean-Sébastien Vialatte, deputies (13th legislature, February 2012).
- The stakes of synthetic biology, by Mrs Geneviève Fioraso, deputy (13th legislature, February 2012).
- Technological breakthroughs in medical science, by Mr Claude Birraux, deputy, National Assembly report 3723 (13th legislature)
- The stakes of strategic metals: the case of rare earths elements, by Messrs Claude Birraux and Christian Kert, deputies. National Assembly report 3716 (13th legislature)

- Endocrine disruptors: a time for caution, by Mr Gilbert Barbier, senator. National Assembly report 3662 (13th legislature), Senate 765 (2010–2011).
- Nuclear safety: Intermediate report of the special joint parliamentary committee on nuclear safety, present and future outlook of the nuclear industry, by Messrs Christian Bataille and Claude Birraux, deputies, and Bruno Sido, senator. National Assembly report 3614 (13th legislature), Senate 701 (2010–2011).
- The pollution in the mediterranean sea: current situation and perspectives for 2030, by Mr Roland Courteau, senator. National Assembly report 3589 (13th legislature), Senate 652 (2010–2011).
- Assessment of the three-year national plan on radioactive waste management, by Messrs Christian Bataille and Claude Birraux, deputies. National Assembly report 3108 (13th legislature), Senate 248 (2010–2011).
- Mathematics in France and in modern sciences, by Mr Claude Birraux, deputy. National Assembly report 3085 (13th legislature), Senate 222 (2010–2011).
- State of research on the prevention and treatment of obesity, by Mrs Brigitte Bout, senator. National Assembly report 3020 (13th legislature), Senate 158 (2010–2011).
- Assessment of the application of Article 26 of the Bioethics Act, by Messrs Alain Claeys and Jean-Sébastien Vialatte, deputies. National Assembly report 2718 (13th legislature), Senate 652 (2009–2010).
- Mutation of viruses and the management of pandemics: the example of the A(H1N1) virus (final report), by Mr Jean-Pierre Door, deputy, and Mrs Christine Blandin, senator. National Assembly report 2654 (13th legislature), Senate 581 (2009–2010).
- Management of pandemics: HINI, what hindsight? (report of the public hearing of 14 June 2010), by Mr Jean-Pierre Door, deputy, and Mrs Christine Blandin, senator. National Assembly report 2717 (13th legislature), Senate 651 (2009–2010).
- Effects on health and the environment of the electromagnetic fields produced by high and very high voltage lines, by Mr Daniel Raoul, senator. National Assembly report 2588 (13th legislature), Senate 506 (2009–2010).
- Pesticides and health, by Mr Claude Gatignol, deputy, and Mr Jean-Claude Etienne, senator. National Assembly report 2463 (13th legislature), Senate 421 (2009–2010).
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- Faced with A(H1N1) influenza and the mutation of viruses, what can researchers and the public authorities do? (Report of the public hearing of 1 December 2009), by Mr Jean-Pierre Door, deputy, and Mrs Christine Blandin, senator. National Assembly report 2226 (13th legislature), Senate 204 (2009–2010).
- Assessment of the principles applying in France to animal experimentation and alternative methods to it, by Messrs Michel Lejeune and Jean-Louis Touraine, deputies. National Assembly report 2145 (13th legislature), Senate 155 (2009–2010).

PUBLIC HEARINGS

- An assessment of French presence in sub Antarctic islands, by Messrs Claude Birraux, deputy, and Bruno Sido, senator.

- Monogenic diseases: the current situation, by Messrs Claude Birraux and Jean-Louis Touraine, deputies.
- The stakes of strategic metals: the case of rare earths elements, by Messrs Claude Birraux and Christian Kert, deputies.
- Technological breakthroughs in medicine, by Mr Claude Birraux, deputy. National Assembly report 3723 (13th legislature)
- The Alliances: a new dynamic for research, by Mr Claude Birraux, deputy, National Assembly report 3375 (13th legislature), Senate 453 (2010–2011).
- The inputs of sciences and technologies to the evolution of financial markets, by Mr Claude Birraux, deputy, National Assembly report 2987 (13th legislature), Senate 140 (2010–2011).
- Lessons to be learnt from the eruption of the volcano Eyjafjöll, by Mr Christian Kert, deputy. National Assembly report 2851 (13th legislature), Senate 28 (2010–2011).
- Is France ready for an earthquake? by Messrs Jean-Claude Étienne and Roland Courteau, senators. National Assembly report 2721 (13th legislature), Senate 653 (2009–2010).

TARGET GROUPS

First, Members of parliament. But also research institutions, academies of science, universities and civil society.

COMMUNICATION AND PUBLICATIONS

OPECST reports are published. A summary of 4 pages is usually also available. All its publications and the videos of its public hearings are posted on the National Assembly web site, section OPECST.

IMPACT

The Office has progressively become an acknowledged instrument of parliamentary action. Several laws make provision either for it to be informed of, or to participate in the appointment of representatives of Parliament to various bodies, or for its representation, by its President or one of its members, on the board of directors of various organisations. It has also become a special interlocutor for the scientific community as a whole and maintains close links with it. The events bringing together the OPECST and high level scientific organisations, Académies, CEA, Cité des Sciences et de l'Industrie, CNRS, etc.- are the true illustration of this.

Every year, several conferences and seminars are organised by the OPECST, either in relation to one of its reports or on a scientific or technological subject. Finally, the OPECST also contributes to the development of international parliamentary relations and takes part in various congresses and events, in particular at a European level. Thus, over the last few years, we have seen the setting-up of an information and exchange network, the European Parliamentary Technology Assessment (EPTA), bringing together the European organisations

responsible for conducting scientific and technological assessments for national Parliaments and the European Parliament.

In the near future, the OPECST would like to continue to strengthen its various missions and, in particular, to play a role in furthering the exchange between the political and scientific worlds.

THE WAY AHEAD

1. Study in progress

Outlook of the civil aviation for 2040.

2. Towards a new group of MPs members of OPECST, after the future parliamentary elections in June 2012. A new programme of studies will be then launched, probably in September–October 2012.

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GERMANY – OFFICE OF TECHNOLOGY ASSESSMENT AT THE GERMAN BUNDESTAG

The Office of Technology Assessment at the German Bundestag (TAB) has been advising Parliament on important questions of technological and social change since 1990. The primary aim is to supply Parliament with information providing a scientific basis for its debates and decision making.

Technology assessment (TA), as TAB sees it, has the following tasks:

- to analyse the potentials of new scientific and technological developments and explore the associated opportunities,
- to examine the framework conditions for implementing scientific and technological developments,
- to analyse their potential impacts in a comprehensive forecast, pinpoint the opportunities offered by using a technology and indicate the possibilities for avoiding or reducing its risks.

All this is the basis for developing alternative options for the policy-making process.

INSTITUTIONALISATION

As in other industrialized countries, public debates on technology assessment (TA) started in Germany in 1972–1973, prompted by the creation of the Office of Technology Assessment (OTA) of the U.S. Congress and the prior intensive debate on TA and its institutionalisation. This debate only bore fruit in 1989 with a parliamentary resolution to create the »Büro für Technikfolgen-Abschätzung beim Deutschen Bundestag«. The organisational model adopted has two key features.

THE GOVERNING POLITICAL BODY

The Research and Technology Committee, which was given the responsibility for initiating TA investigations and controlling them politically, was renamed »Committee for Research, Technology and Technology Assessment«. The Committee's secretariat was expanded in line with these new responsibilities.

THE OPERATIONAL TA UNIT

Under the terms of the Bundestag resolution, an appropriate scientific institution outside Parliament must be selected through tender and commissioned to establish and operate the TA unit. The legal basis for this is a supplement to section 56 of the Bundestag's Rules of Procedure. The TA unit to be established will work exclusively for the Bundestag. It has to ensure parliament-specific presentation and communication of the results of its work.

On 29 August 1990, after a tendering procedure and at the proposal of the then Committee on Research and Technology, a contract was signed with the Karlsruhe Nuclear Research Centre

for a three-year pilot phase and the Office of Technology Assessment at the German Bundestag (TAB) was founded. Since then, it has been operated by the Institute for Technology Assessment and Systems Analysis (ITAS) Centre (before 1995 it was named AFAS, Department for Applied Systems Analysis) of the Karlsruhe Institute of Technology (KIT), a merger of the Karlsruhe Research Centre and the University of Karlsruhe.

After the conclusion of the pilot phase, the German Bundestag decided on 4 March 1993 to establish a permanent advisory institution »Technology Assessment at the German Bundestag«, as a result of the positive findings of the responsible Committee for Research, Technology and Technology Assessment. Since that time, the TA unit is run on the basis of a series of contracts with a duration of five years each. The last major change was in 2002 the decision that ITAS would cooperate in specific areas with the Fraunhofer Institute for Systems and Innovation Research, Karlsruhe. The current contract runs till September 2013.

ORGANISATION AND RESPONSIBILITIES

TAB is operated by the Karlsruhe Institute of Technology (KIT) under a contract with the German Bundestag. TAB is an independent scientific unit of the Institute for Technology Assessment and System Analysis (ITAS). TAB and ITAS cooperate in conducting research as well as in developing concepts and methods of technology assessment.

The Director of TAB is appointed by KIT in consultation with the responsible Committee on Education, Research and Technology Assessment. Professor Armin Grunwald, who also heads the Institute for Technology Assessment and Systems Analysis (ITAS) at the Karlsruhe Institute of Technology, is responsible for the scientific results of TAB's work and represents them vis à vis the German Bundestag.

The director of TAB and his or her staff are, in matters of content, not bound by instructions of the KIT with respect to any tasks assigned to them by the Bundestag, and that the director of TAB has responsibility for the scientific accuracy of the results produced by TAB and also has sole responsibility for selection TAB staff. TAB is located in Berlin. Currently, eight scientists from various disciplines are employed there.

As TAB's governing body, the Committee on Education, Research and Technology Assessment is chiefly responsible for deciding on the work programme, approving final reports, and communicating with the Members of Parliament and its committees. It has a standing »TA rapporteur group«, with one member from each parliamentary political party. This group prepares all the decisions on TAB to be taken by the Committee, from the decision to carry out a TA project through to approval of the final report. The Committee secretariat assists the rapporteurs in their work.

FINDING TOPICS

Proposals for TA-studies can come from one or many of the parliamentary groups in the Committee for Education, Research and Technology Assessment as well as any of the other

committees in the German Bundestag. Under the guidance of the committee chairwoman, the TA-rapporteurs along with the director of TAB discuss the political and factual relevance of requested topics. TAB submits a statement for every proposal on its scientific workability as well as considerations of the objectives, substance, and methods. Topics are then selected and unanimously presented to the committee for debate and decision. A proposal is accepted when a third of the committee members do not oppose it.

WORK PROCEDURES AND METHODS

After decision by the Committee, TAB is responsible for scientific and organisational implementation of the TA studies. The project team begins with intensive research and consultations with experts on relevant research issues and findings. These also help in exploring opposing scientific opinions and controversial positions by various interest groups. For central issues defined for a study, TAB makes recommendations to the Committee on expertise to be commissioned from external experts or scientific institutions. Cooperation with such external experts and their reports is a central element of project work.

Over the entire term of the project, the team monitors and analyses the ongoing scientific debates and related public and political discussions. Particularly when interim findings are at hand, workshops and expert meetings are organised to bring together scientific experts and Members of Parliament. Representatives of societal groups are frequently included. This also aims to promote communication between science, society and German Bundestag and the transfer of knowledge and opinions, even before completion of a project. The results of all activities are summarised by TAB, and the project is concluded with a final report.

TA PROJECTS AND MONITORING ACTIVITIES

TA projects and monitoring activities are central working areas for TAB. These areas have proved ideal, particularly as a means of channelling the numerous requests for topics received from the expert committees and parliamentary political parties into analytical processes suitable for the purposes of German Bundestag.

- TA projects deal with complex issues of science and technology. Such projects apply a comprehensive, interdisciplinary approach and a long-term perspective (e.g. nanotechnology, synthetic biology, and modern power grids).
- Monitoring activities consider selected aspects of developments in science, technology and society (e.g. regulation, innovation, experience made in other countries). Their thematic focus makes them particularly suitable for current issues. They are also helpful in identifying and determining the exact content of future and more comprehensive assessments. Finally, they contribute to strengthening the core competences of TAB in important areas (e.g. themes such as sustainable energy supply, acceptance of new technologies, eLearning, genetic diagnostics and gene therapy).

FUTURE REPORTS, POLICY BENCHMARKING AND INNOVATION REPORTS

These analytical approaches – for which the cooperation partner Fraunhofer-Institute for Systems and Innovation Research (ISI) holds lead responsibility – are used to open up specific additional prospects:

- Future reports are intended to identify technological fields with relatively medium and long-term relevance which are expected to require parliamentary action. Among other things, this enhances the Committee's opportunities to put issues on the political agenda at an early stage.
- Policy benchmarking uses international comparative studies of policy approaches in other countries and political options for action being debated there, to contribute to the Committee's ability to assess solutions in various countries and areas of technology.
- Innovation reports are intended to review current innovations in areas characterised by particularly rapid development, a high degree of sensitivity and a low level of empirical information.

TOPICS

The topics on which TAB conducts assessments comprise a broad range of actual scientific and technological issues with high relevance for politics. One focal point lies on the field of environment and health, examples are reports on »Medicines for Africa«, and »Geoengineering«. Another focus is on the dynamic and controversial issue of bio- and gene technology. To this, TAB submitted reports such as »Gene Doping«, »Transgenic Seeds in Developing Countries«. Examples for projects in the field of resources and energy are »Renewable Energy Sources to Secure the Base Load in Electricity Supply«, »Energy Storage Technologies«, »Carbon Dioxide Capture and Storage«.

Under the umbrella of technology, society and innovation, TAB studies are focused on identifying potential areas of innovation as well as the strengths and weaknesses of Germany's innovation system. Furthermore, another focus of these studies are the challenges of research, education, and innovation policies.

SELECTED RECENT AND ONGOING PROJECTS

- Application potential of remote sensing for developing countries
- Organic farming and biomass production
- Electric mobility concepts and their significance for economy, society, environment
- Electronic petitioning and modernisation of petitioning systems in Europe
- Future of the automobile industry
- Geoengineering
- Medicines for Africa
- Modern power grids as a key element in a sustainable supply of energy
- Organic farming and biomass production
- Postal services and modern information and communication technologies

- Regulations for access to the information society
- Renewable energy sources to secure the base load in electricity supply
- Supply of raw materials for high-tech German industries
- Sustainability and Parliaments: Survey and Perspectives RIO +20
- Synthetic Biology
- Technological advances in healthcare: A Source of rising costs or an opportunity for cost savings?
- The future of the automotive industry
- Valorisation of Biodiversity
- White Biotechnology -- present status and future perspectives

TARGET GROUPS

In accordance with its mandate, the work of TAB is focused on the German Bundestag. An important role in parliamentary proceedings is played by the committees to which TAB reports are routinely forwarded for deliberation. These committees are crucial actors in using and disseminating the findings of TAB. Over time, the range of committees initiating TA studies (and discussing TAB reports) has grown considerably.

Besides this primary audience, all other Members of Parliament, parliamentary committees, staff of the parliamentary political parties and of Members of Parliament as well as the Scientific Service of German Bundestag comprise the audience for and potential users of the results of TA processes. In addition there are study commissions, to which there are often close informal contacts. The Federal and State ministries also follow the work of TAB with close interest. Finally, companies, government agencies, research institutions and educational institutions and – not least – interested members of the public also call upon TAB findings.

Parliamentary TA is also designed as a forum for public discussion. Intensive communication of project results, e.g. by presentations at public sessions of the Committee, workshops with experts and representatives of societal organisations (interest groups, NGOs), and press conferences and discussions enhance the visibility of parliamentary TA. In this way it becomes clear to a broad public that German Bundestag is also looking beyond daily business, to take a scientifically well-based approach to long-term prospects in technological and social development.

COMMUNICATION AND PUBLICATIONS

The results of the TA projects and other TAB work are documented and made available as TAB working reports and background and discussion papers. Selected reports are issued as printed papers of German Bundestag (Bundestagsdrucksache). Since 1996, selected final reports on TA projects have appeared in the series »Studies by the Office of Technology Assessment at German Bundestag«, published by edition sigma, Berlin.

TAB and its current information are also accessible on the Internet (www.tab-beim-bundestag.de) and on the German Bundestag intranet. The TAB letter appears twice a year, and contains primarily information on the TAB working programme and reports on the findings of TAB projects and monitoring activities.

IMPACT

It is far from easy to assess the direct impact that TA and related forms of scientific policy advice have on decision making. On the one hand the general rule applies, that proposed pieces of legislation never quote the sources of information by which they may be inspired. On the other hand, TA is only one of a multitude of voices that influence the decision making process. Because of the lack of direct evidence one has to rely on more indirect means to assess utilization and usefulness of TA »products« to the »customer«, the Parliamentarians.

The first and maybe the most important criterion is the satisfaction of the Members of Parliament, which may be expressed openly in parliamentary debates or in more informal ways including face to face conversations. In fact TAB has fared quite well in this respect and there are numerous examples of MP's highlighting their praise of TAB's work.

A second one is the frequency of the occasions where Parliament in plenary debates and in Committee meetings deals with TAB-reports. The number of Committees that put TAB-reports on their agenda has indeed increased constantly in recent years. To a somewhat lesser extent the same holds true also for plenary debates, which documents the continuous practice of Parliament to consult technology assessment in complex scientific and technological issues.

Another indicator of how well received TAB's advice is, is the demand for new TAB-studies, which continuously exceeds the capacity by a wide margin. For example, during a recent procedure of finding new topics, Parliament came up with close to 70 suggestions for new topics of which only 12 could be taken up because of capacity limitations.

And last but not least also the resonance in the media and the general public as well as the demand for electronic and printed versions of TAB products is an indication that TAB's work is very well known and well received by many societal groups, may it be trade associations, NGOs, scientific and educational institutions, federal and regional ministries or others.

All in all, the interest in TAB's activities both by expert audiences and the general public has stabilised on a high level. Even though TAB does not engage in intensive press and public relation activities, the resonance in the press and electronic media is very favourable and the TAB-staff is frequently asked for interviews or statements.

THE WAY AHEAD

In view of the highest accolade that Parliamentarians voice with respect to their satisfaction with TAB's work, there is no need for radical changes but rather a continuous evolutionary adaptation to ever changing circumstances and framework conditions.

One important issue in this context is the notion to devise parliamentary TA gradually more as a forum for public deliberation and discussion. An intensified public-oriented communication of the results of parliamentary TA and the design and testing of alternative formats for presentation could be means to improve the active role of Parliament in the handling of cross-sectional and future related topics of high societal relevancy.

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GREECE –
GREEK PERMANENT COMMITTEE OF RESEARCH AND TECHNOLOGY ASSESSMENT

The Greek Permanent Committee of Research and Technology Assessment (GPCTA) is a parliamentary committee provided by the Standing Orders of the Hellenic Parliament. Its scope is to study national affairs or issues of general interest that emerge from technology development.

INSTITUTIONALISATION

GPCTA is instituted at the onset of every legislative period upon the Parliament's decision following a proposal of the government or the presidents of the parliamentary groups. With the decision on the composition of the committee, the Parliament determines the topic that the committee will deal with and the deadline by which it will submit its findings. The special committees are composed by the one tenth (1/10) and up to the one fifth (1/5) of the total number of Members of Parliament (article 42). Currently it consists of 25 Members of Parliament representing all the parliamentary groups in the House.

Its task covers any matter within the sphere of research and technology development in order to give advice on relevant strategic issues. It is also entitled with the encouragement of international cooperation on technology assessment. Article 43 A of the Standing Orders of the Hellenic parliament provides also that the committee for the accomplishment of its task may cooperate with similar institutions functioning within the parliaments of other countries, encourage the international cooperation and research on TA matters and proceed to the exchange of information between the respective parliamentary institutions on TA.

The scientific support of its work is undertaken by the Directorate of Studies of the Hellenic Parliament. Several scientists and research fellows participate in the discussion meetings of the committee in order to present their points of view on TA matters.

ORGANISATION AND RESPONSIBILITIES (MISSION)

The committee, through its work, tries to leverage the promotion of research, technology and development in the country. The committee will support every significant effort in research and technology development. An important mission is to inform the citizens on developments in science and new technologies that take place both in Greece and the »global village« through the committee's reports.

The main goals are:

- Highlight the importance of investment in research and technology
- Encourage the business community to invest in Research, Technology and Development.

- Assist the Ministry of Education to promote the work of the General Secretariat for Research and Technology (GSRT)
- Monitor the developments in scientific research and evaluate the benefit for society
- Contribute to decision making and strategies in Research, Technology and Development

FINDING TOPICS

Areas, to which the Committee devotes special attention and derive topics from, are:

- Environment: Innovative technological applications in the areas of protection and energy saving
- Transportation: Presentation of new and alternative technology applications in reducing fuel consumption
- Information and Communication Technologies: View of best practices in education and entrepreneurship
- Health: Promoting internationally recognized medical research and technological applications in the areas of diagnosis, treatment, medicines and pharmaceutical industries.

In these areas seeks to:

- Show good practices of cooperation of laboratory and applied research
- Encourage innovative practices in the production process
- Support winning international cooperation in research and technological development
- Promotion of good practice in support of the private sector in the work of research institutions

WORK PROCEDURES AND METHODS

The Committee, after the topics are decided, organises meetings once or twice every month where the MPs are informed by invited experts on various themes.

The committee cooperates with:

- the Ministry of Education and the General Secretariat
- the Educational Institutions and Research Centres
- Entrepreneurs who invest in research and technology

Also:

- Visits to research centres and educational institutions in Greece and abroad are organised.
- The cooperation with similar committees of parliaments of other countries, EU and other international agencies, organisations, institutes and research centres is encouraged.
- Cooperation with other committees of the Hellenic Parliament and particularly the Environment Committee with which they have joint meetings when common issues occur.

TOPICS

A selection of topics in which the Committee was engaged recently:

- Genetically modified food
- Perspectives for the Hellenic satellite HELLAS – SAT
- Briefing on the activities of the National Centre for Marine Research
- Regulatory Authority on Energy
- Internet Addiction of children and teenagers
- Clinical Tests of Medicine
- Renewable Energy Sources
- National Programme on anti-seismic backing of existing buildings
- Digital Course of the nation through the Information Society
- Greek medical research and technology
- Research and technology in food production and the Greek agricultural production
- Greece's participation in the European Programme for Infrastructure (HiPER)
- Participation in developing a national strategy for research and technology

TARGET GROUPS

The main target group where the Committee communicates its findings is the Hellenic Parliament.

All special standing committees after the study of a topic, submits a report to the Speaker.

Each committee at the end of every parliamentary year also submits a report to the Plenary, which is recorded in the minutes and on which a debate follows, without a vote at a special meeting at the beginning of the next year.

COMMUNICATION AND PUBLICATIONS

Every report and its outcomes together with the relevant supporting documents are kept in the archives of the committee and deposited at the end of each parliamentary year in the Archives of the Parliament. Those documents are available to the public through the website of the Hellenic Parliament (only in Greek).

IMPACT

The special standing committees or subcommittees may decide or suggest an opinion when this is decided by the Conference of Presidents according to the Constitution the Parliament's Standing Orders and the law or regulation of the relevant jurisdiction.

Any special Standing Committee may, during the preparation or proposal of a law and before the second reading of the articles, to give an opinion on a matter of great importance of that proposal, which falls within its competence.

THE WAY AHEAD

The committee has mainly an advisory role but recently it was decided to examine more closely the Greek research and development system. The committee follows, as much as possible, the research and technology development in our country. It tries to demonstrate the role of science, technology and innovation and how these can change the development model of the country on a path of sustainable growth and competitive economy. It highlights the characteristics and the capabilities of the Greek research system, which in turn will support the design of appropriate policies.

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THE NETHERLANDS – RATHENAU INSTITUUT

The Rathenau Instituut is an independent organisation for technology assessment and science policy. By ministerial decree it fosters public debate and policymaking on science and technology. The Institute studies the societal impact of science and new technologies and the organisation and development of science and innovation. It publishes reports and policy briefs and initiates debates on issues and dilemmas relating to science and technology.

Apart from fostering the political and societal debate and supporting policy making, the Rathenau Instituut helps build and intensify mutual trust between society, authorities, science and technology and substantiate democratic processes. Upon request it takes on a mediating role in case of conflicts and controversies between parties in society, science and public administration. Its activities help strengthen national science and innovation policy.

INSTITUTIONALISATION

In 1986, the Rathenau Instituut was founded by the Dutch Ministry of Education, Culture and Science. The institute is governed by the Royal Netherlands Academy of Arts and Sciences (KNAW). The ministerial decree establishing it guarantees the Institute's autonomy, including its financial autonomy.

The Rathenau Instituut has a Board whose members are appointed by the Minister, at the nomination of the sitting members of the Board, and in consultation with the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Scientific Council for Government Policy (WRR).

The Institute's staff consists of a Chairman and Board, a Programme Council and a multidisciplinary team of scientific researchers and communication experts. In this team, physicists, biologists, statisticians, computer scientists and technical engineers cooperate with social and political scientists, philosophers and economists. Their common objective is to develop a clear picture of the political and societal debate and to feed and stimulate it as much as possible.

The institute employs approximately 50 people and has an annual budget of around 5 million EUR.

ORGANISATION AND RESPONSIBILITIES

The Rathenau Instituut has two key tasks:

- To contribute to the societal debate and political opinion forming on issues related to – or resulting from – scientific and technological developments. This includes ethical, social, cultural and legal aspects. The Institute contributes in particular to the formation of

political opinions in both Houses of Parliament, the European Parliament and parties involved in the scientific world.

- To increase the insight into how the science system works, by collecting, integrating and analysing data and making them accessible for policy and scientifically grounded policymaking. The science policy studies are directed at Government, Parliament and science organisations.

FINDING TOPICS

Scientific, societal and political developments and trends steer the Rathenau Instituut's activities. This is why the biannual Work Programme is designed with a brief outline of the very developments that will primarily determine the institute's work over coming years.

For this outline, there is regular consultation with the Institute's Programme Council, an advisory board whose members come from academia, business, politics and journalism. The Rathenau Instituut's Board then selects the work themes, by taking the following three criteria into consideration:

- The themes involve new technological and/or scientific developments. This can involve the development of new fields of science and technology or new trends within the whole science system.
- The themes are or will be politically, socially or administratively relevant; for instance because many citizens are directly or indirectly involved in the consequences of a certain technology or because a scientific development may change the way in which social issues are dealt with.
- The themes are or will be the topic of discussion or opinion forming. In other words: they are not yet socially, administratively or politically »ready« for introduction to society at large.

In the Work Programme we leave space to tackle current political and societal events, or topics from previous Work Programmes as they often become current again. Sometimes, political and social developments require accelerated or tailor-made investigations.

In drafting the final Work Programme, the opinion of the House of Representatives is sought. The Work Programme is reviewed by the Minister of Education and Science, who renders an opinion on it and then forwards it to both Houses of Parliament.

WORK PROCEDURES AND METHODS

POLITICAL OPINION FORMING

The Rathenau Instituut assists in the process of political opinion forming through direct contact with both Houses of the Dutch parliament and the European Parliament. Its staff is called as expert witnesses at formal hearings and organise or take part in round table discussions and expert meetings. The Rathenau Instituut also strives to ensure that all reports and other products are relevant and accessible to decision-makers at all levels.

SUPPORTING POLICY MAKING AND PUBLIC DEBATE

Researchers of the Rathenau Instituut often meet with policymakers to bring findings to their attention and to make sure that the developments are given a place on the political agenda. The Institute also promotes general discussion of the research topics, making an active contribution to the public debate. Rathenau Instituut experts are regular contributors to the national media and the Institute takes every opportunity to publicize its work at festivals, conferences and debates. The Rathenau Instituut publishes a newsletter and makes full use of digital technology, including social media, in engaging NGOs, stakeholder groups and the general public.

METHODOLOGY

Good methodology is essential to the quality of the work delivered by the Rathenau Instituut. All its activities are based on highly diverse analytical and communicative methods, such as focus groups, citizen panels, statistics, database analysis, questionnaires, interviews, visualisations, debates and presentations. For each project the methods that lend themselves best to realising objectives are carefully considered. If required, new methods are developed which are hopefully suitable for several projects.

To bring science dynamics and international comparisons into focus, the Rathenau Instituut has developed expertise in the domain of scientometrics. It works on social network analysis methods to map science and technology networks, and conducts agent-based modelling pilots whose purpose is to stimulate complicated policy problems, making use of methods and techniques also used for »horizon scanning« and »foresight« among other things. In addition, it reflects on information visualisation, for instance in graphics, diagrams, networks and photos.

TOPICS

The Work Programme 2013–2014 (www.rathenau.nl) describes the Rathenau Instituut's themes and subthemes. The main themes are elaborated upon in projects. Examples are:

THE RESILIENCE OF KNOWLEGDE INFRASTRUCTURE

- The future of the academic system
- Non-academic public research institutes
- Exploration of practice-oriented research
- Scientific careers
- Financing research

SOCIETAL PERMIT OF SCIENCE AND TECHNOLOGY

- Attitudes regarding science
- Valorisation
- Democratization of knowledge
- Science communication

INNOVATION 2020

How are we to control our position of competing economies?

- The future of innovation in The Netherlands: globalisation and key technologies
- Science as a partner for growth
- Innovation and regulation
- Cocreation of knowledge and innovation

HUNGER FOR RAW MATERIALS IN BROADER PERSPECTIVE

- In search of societal support
- Recycling opportunities
- Climate engineering
- Consumer behaviour
- Long-term food security

SHIFTING HEALTHCARE

- Patients know better
- Measurable humanity
- Medical research

BIG DATA, LARGE CONSEQUENCES

- Algorithm: smart, foolish or dumb / smarter than an average bear?
- The electronic lifestyle coach
- Digitalisation of our brain
- Digitalisation of risks and disasters

TARGET GROUPS

The target groups of the Rathenau Instituut consist of both Houses of Parliament, government, policymakers and other national public institutions and decision-makers, science and technology organisations, the European Parliament.

For strengthening the public debate, the Rathenau Instituut focuses on reaching the national media and through them the wider general public, and on reaching and involving issue-related stakeholders, such as citizens, NGOs, businesses and other interested parties.

COMMUNICATION AND PUBLICATIONS

The Rathenau Instituut publishes scientific reports, background studies and Research Briefs to provide politicians and policymakers with reliable, relevant and up to date information. For a quick overview, we gather experts' visions around a topical theme in collections of essays. In our twopage Research Briefs, we provide tailor-made analyses and policy recommendations.

The institute uses a wide range of interactive communications tools to disseminate its findings, such as expert meetings, public debates, talk shows, events and forum discussions to promote interaction with citizens, policymakers, politicians and other parties. The aim here is the exchange of thoughts or to initiation of a debate to get the images, visions and standpoints of participants out into the open.

Often, the media are crucial in getting themes onto the agenda. Visibility in the media and a good relationship with the press are of a high priority. Opinion pieces by Rathenau Instituut researchers regularly appear in national newspapers. Researchers are also frequently interviewed or asked by journalists to respond to current developments.

Apart from working with the press, the Institute's own media is used to communicate: a well-visited website and weblogs, a monthly digital newsletter and social media such as *Twitter* and *Facebook*. *Flux* magazine, with accessibly written news and background information on science, technology and society, is published twice a year.

Other creative representational forms and communication tools to involve the public, press and politicians are also used experimentally. Examples include: a television documentary, a theatre play, an interactive exhibition or installation, interactive books, web games and even a »serious« game for the iPhone.

IMPACT

The Rathenau Instituut's studies and policy briefs often set the agenda for politicians, policymakers and the media, or give a particular twist to debates that seem mired in traditional black and white points of view.

Most of its projects are quoted in parliamentary documents, in the national media and on stakeholder websites. Our experts regularly appear in national newspapers, news sites and on TV. They are frequently asked to appear in – or help organise – debates, parliamentary committees and hearings or expert meetings.

There is a loyal and continually growing following for newsletters and social media projects, and the website pulls in ten thousand visitors a month. A recent survey showed that the readers of *Flux* Magazine highly appreciate the quality, depth and design of the magazine.

Several projects have led to obvious political and societal impact. Recent examples include the projects *Emerging Markets of Body Materials* and *Effects of Research Priorities.*

Emerging Markets of Body Materials was covered by the national media and became a recurring item in popular late night talk shows. It started a debate both on the opinion pages of national newspapers and in scientific magazines. Due to its impact, a Parliamentary Roundtable Committee was organised. The documentary »Baby for Sale« – a subtheme to the project – led to the formation of an official Cabinet Standpoint. Government bodies are currently working on the legislative issues pointed out in the study and the Rathenau Instituut's researchers are providing assistance as experts.

Effects of Research Priorities (or Focus and Mass in Dutch policy lingo) studied the effects of investments in priority research fields such as nanotechnology, genomics, water, and high tech systems. The conclusion was that investments had not improved the international position of the Netherlands in these fields, nor had there been growth in these fields nationally. It led to a strong political debate within the research community.

STATUS QUO AND THE WAY AHEAD

In the coming years, the Rathenau Instituut aims to become the national authority on objective and reliable information on scientific and technological trends that have an impact on society.

The Rathenau Instituut strives to become a trusted knowledge partner on innovation and industrial Research & Development issues, and it continues to extend its role as an independent partner to parliament and policymakers in providing evidence based strategies for the strengthening of our national science and innovation policy. It will develop a bi-annual agenda for Risk and Incident Assessments for policy departments, and a Research Agenda for Science, Innovation and Technology policies.

As science and technology policymaking gets a stronger European and international dimension with cross border aspects that have an impact on national policies , the Rathenau Instituut will both scrutinize these aspects, and will strengthen its international network of associate and parallel organisations.

It will continue to contribute to political opinion forming and societal debate, and extend Its mediating role in conflicts and controversies between parties in society, science and public administration. The institute will also focus on empowering new audiences, such as young and low skilled people; people that feel the impact of science and technology in their everyday lives, but have had little opportunities to voice their opinions about it.

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NORWAY – THE NORWEGIAN BOARD OF TECHNOLOGY

The Teknologiraadet is a public, independent body for technology assessment. The Norwegian Board of Technology (NBT) advices both Parliament and Government, and raises public debate on topics concerning technology, society and politics.

The Board was established by the Norwegian Government in 1999, after an initiative from the Parliament (Stortinget). The Parliament wanted a body for technology assessment, modeled after the Danish Board of Technology – an independent body with the Parliament as its primary addressee. This also means that parliamentarians cannot be board members – following the principle that one should not give advice to oneself.

INSTITUTIONALISATION

The Government appoints the 15 members of the board for 4-year terms. The members come from academia and business and encompass broad insights in different areas of technology and innovation as well as ethics and societal issues. The Board initiates new projects, which in turn are executed by its own secretariat. Chair of the Board is currently Mrs Siri Hatlen (appointed for the 2012–2016 period). The secretariat employs nine people, including one senior executive officer, six project managers and one information manager. The secretariat is led by the Director, Tore Tennøe.

The NBT is funded by the Government, but to ensure independence, The Norwegian Research Council acts as the supervising authority.

The Board's main tasks are:

- To identify and analyse major technological challenges and contribute to a humane and sustainable technological development.
- To follow current international trends, developments and activities within TA and technological foresight.
- To actively stimulate public debate on technology related issues.
- To explore the potential benefits and consequences of specific technologies for both individual citizens and the society at large.
- To communicate the results of its work to the Parliament, governmental authorities and the wider society.

ORGANISATION AND RESPONSIBILITIES

The NBT produces policy briefs and reports to the Parliament, publishes reports, organises seminars for the standing committees and takes part in open hearings at the Parliament. Oral and written information to the different representatives and party groups are provided on

request. All projects rely on the involvement of external expert groups that are led by the NBT secretariat. Workshops open hearings, and research analyses are also used to collect information and views.

All work is organised around projects. The Board decides independently which projects are adapted, and Board members are represented in all expert groups. In the end phase, the projects are presented to the relevant parliamentary standing committee, often in combination with an open meeting at the Parliament.

An important part of NBT's terms of reference, is to further the public debate on technology and society and to involve lay people in the discussion. Hence, the NBT also functions as an intermediary between research, politics and the public, and facilitates participatory processes as well as scenario workshops.

The Norwegian Board of Technology has a budget of approximately 1,1 million EUR per year.

FINDING TOPICS

Every second year, the Norwegian Board of Technology decides on a core portfolio of projects for the next period. By making a biannual work programme it is possible to cover different technologies and policy areas (such as Climate change and low carbon technologies; eHealth and welfare; Internet policy and privacy; Emerging technologies), as well as different methods.

Using the concept of a »core portfolio« means that it is entirely possible for the Board to decide to move fast and decide on new projects at any meeting. The work plan always includes some spare capacity to be able to do spin-off projects, to follow up when the standing committees give clear feedback or they need input, or to respond to technological developments that were not foreseen.

In the search for new projects, the Board invites research institutes, business and industry, private persons, public administration and politicians to brainstorm, in order to obtain proposals for topics and projects for the Board's agenda. This ensures that the Boards agenda stays transparent and open, and gives thematic inputs from many different areas of society. In 2010 we also arranged ten »idea lunches«, where the board members invited 3–4 people of their choice to engage in conversation about the future with our project managers.

In addition, the secretariat will develop an analysis of societal developments, technology trends and provide an overview of what is going on in international TA. It will also come up with project ideas.

After the idea gathering, the secretariat makes a list with short descriptions of 50–100 project ideas. The Board then selects approximately 20 projects for a closer scrutiny. All ideas are then evaluated by the secretariat, using criteria such as societal importance, technological component, political interest and added societal value. In this phase, the Board also consults MPs and policy makers to get relevant information and feedback, but not on a formalized level.

The Board decides on the project portfolio at a workshop for the Board near the end of the year. This gives room for longer discussions than at ordinary Board meetings.

WORK PROCEDURES AND METHODS

The Norwegian Board of Technology employs a range of different methods in our projects, where these five are considered primary methods: expert groups, consensus conferences, scenario workshops, focus groups and open hearings. These methods are flexible and can be adapted for each individual project.

EXPERT GROUPS

The NBT expert groups are always broadly constituted. The participants originate from different institutions and areas of learning, and usually vary in their professional association with the given topic. An expert group is used to illuminate a current topic, give advice or provide policy options. The participants are chosen based on their academic expertise or practical experience in the chosen field.

An expert group will usually meet 6–8 times during a project, with 4–12 months typically elapsing between the first and last meetings. A project manager from the NBT will lead the process and do most of the writing and organising. The Board members will be briefed on the work, but the making of conclusions and recommendation in a specific project is normally delegated to the expert group.

CONSENSUS CONFERENCES AND CITIZEN PANELS

A consensus conference is an exercise in practical democracy, and involves those who seldom have a forum where they can be heard. The participants take part by virtue of being socially aware citizens. They should not be experts on the topic under discussion, nor should they have prominent positions in organised interest groups that are affected by the given topic.

Citizens can contribute knowledge and perspectives that experts normally do not bring to the table. We are all non-experts in most areas of life, but we also have experiences and values that we can use to assess new information.

The NBT has also used and contributed to the development of other participatory methods such as different citizen panels and citizen summits.

SCENARIO WORKSHOP

Discussion and the exchange of experiences are the core elements of a scenario workshop. The discussions circle around a set of scenarios that are portraits of alternative futures in a given topic. The scenarios may be presented as a movie, lecture, document or some other form. The purpose of the scenarios is to make the participants conscious of future choices involving technology, and encourage them to make critical assessments. Developing new visions and proposals for action may also be a part of the process.

FOCUS GROUPS

A focus group is a type of structured group interview. The goal is that conversations conducted in a group of 7 to 10 individuals will bring to light more information than by interviewing participants individually. The participants in a focus group have special knowledge about or experience with a given topic.

The focus group's topic is limited in scope and determined by the interviewer. It is nonetheless important that the discussions are open enough for the participants to exchange experiences and comment upon each other's viewpoints. Herein lays a part of this method's strength: the conversations and interaction within the group can bring to light more information than by interviewing the group members one by one.

OPEN HEARING

During a hearing, individuals or institutions can give input to a work in progress. Hearings may either transpire in public with prepared papers dealing with key questions or recommendations, or in round-table hearings with plenary discussions. The participants are usually either experts in their respective fields, decisions-makers or representatives of affected interest groups who we believe have special knowledge about the topic.

Prior to a hearing, the Board of Technology has usually done some preparatory work on the topic. As a rule, an expert group has elaborated a set of key questions or preliminary recommendations, which the participants at the hearing should comment upon.

TOPICS

Our projects cover a broad range of topics, but currently the focus is on openness and security, innovation in the welfare state and sustainable technology. We are also partners in international, EU-funded projects that cover the same topics.

Selected recent projects are:

- Security and openness after July 22nd
- Is a fund for green technology a good idea?
- Smarter tools – better schools
- Patient 2.0 – the Internet patient
- Climate summit in the classroom
- Blue revolution and the future of salmon farming
- Synthetic biology
- You Decide – A privacy campaign for primary schools
- The future of ageing

TARGET GROUPS

The Board's main target for communicating its work is the Parliament. Here, all the different political parties are represented, and there is also a broad field of topics represented in the standing committees. The Government is also an important addressee, and is often approached after the initial presentation of conclusions and recommendations to the Parliament.

Another important target group is the public. The terms of reference state that the Board should actively stimulate public debate on technology related issues and raise public awareness concerning the impacts and options of technology. The press plays an important role in reaching the public and raising new items on the societal agenda.

COMMUNICATION AND PUBLICATIONS

The Board focuses strongly on disseminating its projects and results. Most projects are concluded with a proposal to the Parliament. The NBT's 4-page publication summarizes the project and gives clear recommendations on the subject. We also meet with the relevant standing committee and present the project and its results.

The Board publishes reports on most projects. All publications are free and available for download on our webpage. We communicate broadly in several channels. In addition to reports and other printed material we actively use internet as a communication channel. Information on all projects is presented on our website, and we use different social media such as Facebook, Twitter, Vimeo and Slideshare. We have also made several exhibitions. The latest, »The Future of Ageing«, has travel around Norway since 2009.

As partner in the project »Kunnskap kryssar grenser« (»Knowledge across borders«), all our open meetings and seminars are broadcast online. This ensures both lower emissions (people don't have to travel to Oslo to participate) and that people all over the country (and the world) can see the presentations of our projects.

IMPACT

There is ample evidence that reports of the NBT are used in policy, e.g. in issues related to eHealth and telecare, nanotechnology, and privacy. Several of our projects have set the agenda for politicians and media. Most of our projects make it to national newspapers, news sites, and TV.

One example is our project on eHealth, which in spring 2011 was the main story of the front page of Norway's biggest newspaper Aftenposten, with several follow-ups in the days after the launch. The Board's Director also kicked off a debate for politicians and stakeholders on national television.

Our project »You decide!« (teaching material on privacy and use of Internet), has been used by almost 1 million pupils all over the world. It started in Norway in 2007, and has since then been adapted to 16 countries.

STATUS QUO AND THE WAY AHEAD

After the terrorist attacks in Norway July 2011, the Prime Minister has made calls for increased safety measures that do not infringe freedom and democracy. The Board has therefore established a project on security and openness that aims at providing Parliament and the Government input for tackling this challenge.

The Board will also continue its focus on welfare and care technologies, which are also included in the EU-project PACITA. In an ageing society, welfare gains will to a large extent rely on a wise and smart development of technology. Other planned projects include the future of power supply, medical self-testing and advanced manufacturing.

We aim to develop further our participatory methods, and are currently exploring the possibilities of doing participatory methods online and with social media tools.

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SWEDEN – THE PARLIAMENTARY EVALUATION AND RESEARCH UNIT

In 2006, the Riksdag – the Swedish Parliament – adopted new guidelines concerning the work of the committees on research and future issues. The guidelines imply, among other things, that technology assessments will be included more often in committee reports.

TAs are performed with the aim of providing the committees with an evaluation of the consequences of research findings and the introduction of new technology concerning both opportunities and risks. The overall goal is to provide the Parliament with high-quality background material which can be used in debates, committee reports and for evidence-based decisions.

INSTITUTIONALISATION

From 2007, the committees have been able to submit proposals and requests to the Parliamentary Evaluation and Research Unit (PER), which can assist in conducting technology assessments (TAs) within different areas. The unit, situated at the Committee services division, works on behalf of the committees of the Riksdag. Sweden has thus adopted the »Parliamentary unit model« which means that the parliament has its own office for TA studies.

ORGANISATION AND RESPONSIBILITIES

Technology assessments often concern more than one committee. The Riksdag's work with issues relating to the future therefore, wherever possible, is carried out at a cross-committee level. The committees are to cooperate in initiating joint technology assessments. The committees' proposals and requests are submitted to the PER, which can assist in conducting the analyses. This will promote a coordinated management of issues relating to the future. The committees are encouraged to cooperate actively and to inform each other and spread examples of best practices, for example, at chairmen's conferences and meetings of committee secretaries.

The PER works on the behalf of the committees and has thus not the mandate to initiate large projects of its own. Within the framework of a proposal the unit can, however, propose focal points and methods. Two full-time scientists are employed at the unit and external experts can be hired for scientific support and for writing background material. The unit also has one person who is mainly responsible for organising workshops, seminars etc. In addition, two temporary staff members, one via a fellowship-scheme and the other via an internship, work at the unit.

In most cases, an all-party steering group is assigned to provide guidelines for a TA assignment and to ensure that they are carried out in accordance with the Committee's terms of

reference. A contact person from the Committee secretariat is assigned to assist at the meetings with the reference group. A group of experts is also assigned to scrutinise the content of the reports.

FINDING TOPICS

Committees submit their proposals to the PER and as a first step, other committees, relevant to the subject, can be contacted in order to verify their interest in cooperating in the project. A first draft with suggestions of focal points and methods is written, often after discussion with experts in the field. The draft is presented at a committee meeting and the decision to commission the study is taken. Following this, a parliamentary reference group with Members of Parliament from all parties (in most cases) is formalised. If several committees participate, the reference group will be composed of MPs representing the committees involved. At a first meeting with the reference group, the focal points and methods are discussed and decided upon.

WORK PROCEDURES AND METHODS

Generally, the TA projects start at the beginning of the year and the report is finalised and released at the end of the year in connection with the budget debate. A seminar is often held initially with different experts in order to involve MPs and to present the state of the art in the field. The presentations and discussions are summarised and communicated to the MPs via the intranet of the Parliament.

External experts are, whenever necessary, engaged to write background material. An expert group is also formed with the task of scrutinising the report with regard to its content and to ensure the balance of different aspects. The expert group will also help to formulate the conclusions of the study.

The parliamentary reference group discusses the final report and the concluding remarks. In most cases, a public hearing is held at the Riksdag when the report has been printed in order to both discuss the content of the report and to supplement the content with other aspects. The seminar is webcast and broadcast on television. These seminars are also open to the public.

Most of the TA projects, so far, have been expert-based but trials with public involvement have been carried out. Social media have also been used in order to involve the public.

Some of the assignments from the committees have been inventory studies in different scientific areas and these can be used in order to:

- Present the state of the art in a specific field
- List active researchers and research environments – this can be useful for the committees in forthcoming seminars and hearings
- Serve as inspiration for future TAs

TOPICS

The topics have covered different subjects since 2007, many of which have a bearing on the environment and sustainable development. Recent assignments have focused mainly on health issues.

- Sustainable cities – focusing on transport, housing and green areas
- Young people's visions of an urban future: In order to highlight the views of young citizens on urban futures, participatory scenario planning and visioning seminars were conducted with three high schools.
- Antibiotic resistance
- Future Day 2012: MPs have the opportunity to discuss different future issues and their implications for society with a number of leading researchers and experts invited. Three interdisciplinary seminars will be organised in which panels consisting of MPs from three to four committees prepare questions for the speakers
- Nanotechnology and health
- eHealth

TARGET GROUPS

The committees are the main target group for the PER. Reports and seminars are planned in collaboration with committee groups in order to formulate the assignments in accordance with the needs of the committees. Some committees have been very active since 2007 and over time a broader range of committees have in one way or the other been involved in TA activities. As described above, TA projects can be performed at a cross-committee level. Involving more than one committee has two main advantages: the results of the assignment are spread to a wider group of MPs and the involvement of a cross-committee reference group implies that the subject is treated in a wider context.

Even if committees are the main target group, reports are disseminated to a wider audience such as the government, authorities, universities, and NGOs etc. Seminars are also broadcast on television. Trials using social media have been carried out in order to invite the public to discuss specific issues within an ongoing project.

COMMUNICATION AND PUBLICATIONS

The reports are published in the Riksdag Report Series and can be downloaded from the website (www.riksdagen.se). Short versions with conclusions of the larger reports are compiled in Swedish and English. A website has been published on the Riksdag intranet summarising the work on research and future issues. The website will also shortly be available on the official Riksdag website www.riksdagen.se.

IMPACT

TA – reports are often cited in committee reports and in chamber debates but can also be used in other forums such as the government, local authorities etc. Most of the committee seminars are webcast and broadcast on television.

THE WAY AHEAD

The work with technology assessments is still relatively new at the Swedish Parliament. The general trend is that a broader range of committees are showing interest in TA activities. Recent developments are the trials with public involvement, social media and the publication of short policy briefs. Policy briefs have recently been published on nanotechnology and health and antibiotic resistance.

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SWITZERLAND – CENTRE FOR TECHNOLOGY ASSESSMENT

The Centre for Technology Assessment is called TA-SWISS in its short form. It fulfils its assignment to carry out technology assessment in doing studies and participative projects since 1999, according to the Swiss federal law, but its history has started in 1992 already.

INSTITUTIONALISATION

Switzerland is known for its direct democracy. Citizens can participate in decision making with regard to their individual and their communal life. However, those who have felt the need for an institution carrying out technology assessment (TA) have formed a different opinion: »In our developed democracy it is possible to vote on milk prices but ... not on the great challenges ... as for instance the adoption (or the renunciation) of new technologies«, explains René Longet, a former National assembly member. It was Longet who demanded an institutionalised technology assessment in order to encourage public debate on science and society, technology and democracy.

In 1991, the Swiss Science and Technology Council (SSTC) was granted a mandate to originate a technology assessment programme for the years 1992 to 1995. The SSTC was assigned to the Federal Department of Home Affairs (Eidgenössisches Departement des Innern, EDI). After a successful test phase, the mandate was extended and became statutory as part of the Swiss federal law on scientific research (Schweizerisches Bundesgesetz über die Forschung). Thereby, technology assessment was definitely accepted into the scope statement of the SSTC. Another amendment followed in 2007. The issue of the administrative affiliation of TA-SWISS was taken up again. As in a few other European countries, technology assessment was entrusted to the academies of sciences, in this case to the Swiss Academies of Art and Sciences (Akademien der Wissenschaften Schweiz). Since January 1, 2008, TA-SWISS has become a centre of excellence of and an organisation unit of its own within the Swiss Academies of Arts and Sciences.

ORGANISATION AND RESPONSIBILITIES

TA-SWISS looks back onto an eventful history – and has been able to celebrate its 20th anniversary on October 29, 2012. During these 20 years, it has always been of utmost importance for TA to be performed independently of political and economic interests. This is still the highest premise today. State funding allows for the basic financing of TA-SWISS. Additionally, there is third-party funding by independent organisations. In this way, the infrastructure and the personnel of the TA-SWISS office comprising five fulltime jobs is financed. Additionally, project-specific mandates that are assigned to external interdisciplinary research groups and the organisation and execution of participative projects are remunerated by these means.

TA-SWISS acts jointly with renowned national or international research institutes or specialized departments. The assignment of a project to a research group works as follows: The specific TA aspects are clearly stated in the call for tender regarding the specific project; correspondingly, the received offers are evaluated according to these criteria. The TA-SWISS executive committee (TA-SWISS-Leitungsausschuss, LA), composed of roughly 15 members with totally different professional competences and institutional backgrounds, decides whether a project will be carried out as well as which offer to accept in the case of a study. A project manager of the TA-SWISS office then initializes the project and supervises the commissioned institution throughout the whole duration of the project. The final focus of each project always emerges through the cooperative work of and the intensive debate with all participants. Not only the research group entrusted with the project, but also the TA-SWISS office and the monitoring group provide important inputs. The latter, consisting of 10 to 20 persons with appropriate professional competences, is formed specifically for each project. It reviews the concept, the intermediate as well as the final results and thus ensures quality and a well-balanced presentation of the subject.

FINDING TOPICS

New topics are initialized by the TA-SWISS office on the base of a constant monitoring of new scientific and technological developments. Suggestions from external experts or from members of the TA-SWISS executive committee are also integrated in this systematic survey. In this way, subject areas are identified and within these the project managers develop concrete proposals for projects. The TA-SWISS executive committee then decides which new studies are taken up.

TA-SWISS deliberately chooses projects that deal with particularly controversial technologies and assesses their benefits and disadvantages comprehensively. The Centre's independence ensures the credibility necessary for this purpose.

TA-SWISS mainly analyses developments in the fields of biotechnology, medicine, nanotechnology and communication and information technologies. However, the effects of social or cultural complexities are less studied and for this reason they have been identified as a new challenge.

WORK PROCEDURES AND METHODS

Why technology assessment? This question was discussed even before the establishment of TA-SWISS. An instance that poses questions on new technologies in an impartial way is vital, and the following criteria are still valid today: how do new technologies develop, what has to be taken into account, how do they change everyday life in society and how might future scenarios look like? Additionally, the public debate needs to be encouraged today, too.

Politicians and citizens have to be supported in their decision making process by comprehensible illustrations and documentations of facts and circumstances. The results of TA-SWISS studies provide the required basics, information and recommendations on selected

specialist fields. By contrast, the participative proceedings show how citizens rate specific future oriented technologies and topics. It reveals the advantages and disadvantages they ascribe to a certain technological development and it documents the needs of the population, e.g. the need for more transparent information or better protection. The discussions show where citizens see a need for action. In these projects, citizens are the experts representing the population at large. Studies as well as participative methods are employed by TA-SWISS in order to give a comprehensive survey of the chances and risks of new technologies and to favour a knowledge-based technology debate.

As the term »studies« anticipates: Studies are often very extensive and complex. Therefore, TA-SWISS prepares abridged versions of its technology assessment studies. The easily understandable abbreviated versions are essential in communicating the results to politicians and to an interested population. For the participative projects information brochures are first compiled. These brochures brief the citizens involved in a well-balanced way in order to familiarize them with the technological topic that is to be discussed in the citizen debate. A synthesis report will then be issued on the actual discussions. It will not only contain the results, but also the different chains of reasoning showing what was supported and what was criticized by the citizens and why. All these products are important for the realization of the formulated objectives: to support the public debate and to help politicians and citizens in making knowledge-based decisions.

Extensive public relation efforts are vital to reach these target groups. TA-SWISS organises media conferences or publishes articles to draw attention to its projects. Policy makers as well as the interested public receive printed and electronic newsletters and are invited to public presentations, workshops and debates on a regular basis. Politicians are confronted with the projects in personal dialogues and in discussions, and political groups, administrative authorities and expert groups are addressed by presentations and provided with written information material.

TOPICS

In the past few years TA-SWISS has focused on the following subjects:

Biotechnology and medicine:

- Human enhancement
- Anti-ageing medicine

Mobility, energy, climate:

- World Wide Views on Global Warming
- publifocus Road Pricing
- Biomass fuel – second generation

Information society:

- Localisation technologies
- Cloud Computing

- Internet of the future
- publifocus eHealth

Nanotechnologies:

- Nanofood
- publifocus Nanotechnology

Social and cultural TA:

Indicators – emergence and use in politics

As of 2012 TA-SWISS is treating or initializing the following topics:

- Localization Technologies
- Nanotechnology and the environment
- Robots in the social sector
- Electromobility
- Personal genomics
- Deep geothermal energy

TA-SWISS is also actively involved in international projects such as »Parliaments an civil society in technology assessment« (PACITA) and »surveillance, privacy and security« (SurPRISE), a large scale participatory assessment of criteria and factors determining acceptability and acceptance of security technologies in Europe.

TARGET GROUPS

The recommendations resulting from TA projects are intended to be used by parliament and the Federal council as an aid for decision making – especially when controversial technology topics are being discussed. In addition, the project results are communicated to interested politicians, to experts in the fields of science and administration, as well as to the media and interested citizens.

COMMUNICATION AND PUBLICATIONS

All results are communicated to the parliament, the media and the general public by means of a newsletter, of conferences, public talks, articles or exhibits. In depth information on projects and publications is also available on the internet (www.ta-swiss.ch). Studies and publications, especially the abbreviated versions, are obtainable at no charge at info@ta-swiss.ch.

The studies on biofuel of the second generation, on nanotechnology in the field of foods, on anti-aging, the emancipation of the computer and geolocalization are available at your local book store. You can also order them at www.vdf.ethz.ch or download them as an e-book.

IMPACT AND THE WAY AHEAD

Political decision-makers rely on assessments which show the consequences and social impact of technologies. The work of TA-SWISS is widely recognized for its quality and the impartiality of its assessments. It is vital for TA-SWISS to continually strive for these qualities in order to maintain support from all political parties.

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UNITED KINGDOM – THE PARLIAMENTARY OFFICE OF SCIENCE AND TECHNOLOGY

Debate on the need to establish a science and technology assessment function at the UK Parliament began in the early 1980s but it was only later that decade, after a parliamentary delegation visited the Congressional Office of Technology Assessment in the USA, that this became intense. Spurred on by the creation of offices in the Netherlands and France – and at the European Parliament – the decision was taken to set up POST in 1989.

INSTITUTIONALISATION

For its first three years, POST operated outside of Parliament as a charitable foundation, funded by UK learned societies and scientific foundations.

The intention was always for POST to be an internal parliamentary office and in 1992 both Houses of the UK Parliament decided to take over its funding and to create a pioneering bicameral office. In 2000, both Houses took the decision to make POST a permanent institution at Parliament, after an examination by the House of Commons Information Committee and a debate in the Commons chamber.

ORGANISATION AND RESPONSIBILITIES

All POST's activities are determined by its Parliamentary Board, composed of 10 members of the House of Commons, four from the House of Lords and, highly unusually, 4 non-parliamentary members – leading scientists and engineers with skills in particular areas of science and technology.

POST has a permanent staff of six scientific and technical specialists, a Director and two PA's. These are complemented by the POST fellows (see below) of whom there are usually 5–6 present at any time. It is difficult to give an authoritative figure for the total annual budget of POST as many services such as accommodation, IT, training, etc. are provided centrally by the UK Parliament. However, annual direct operational costs are about 500,000 GBP.

FINDING TOPICS

POST's work programme is mapped out by its Board at quarterly meetings. Proposals come to the Board from several sources. Most are developed by the staff, who are engaged in a continual process of discussion with parliamentarians, committee staff and the wider scientific and technological community in academia, enterprise and NGOs. Individual parliamentarians are also encouraged to make suggestions – and an important source is also the parliamentary committees in the two Houses. Finally, POST has received proposals from external

organisations and even individual members of the public, often conveyed via a Board member or other individual parliamentarian.

WORK PROCEDURES AND METHODS

All POST research is conducted in-house by either its permanent staff or by one of its doctoral/post-doctoral fellows. These fellowships are a distinctive feature of POST. They are funded by many UK charitable scientific foundations, by learned societies, by most of the UK's Research Councils and by individual universities. Through them, fellows spend usually three months at POST, working on one of its well-known »POSTnotes« or assisting a parliamentary committee. Well over 100 such fellows have now been at POST.

POST's work lies heavily in the area of »expert analysis« conducted by the staff and fellows but augmented by an intense dialogue with outside individuals and organisations with a relevance to the subject area.

POST has, however, pioneered various methods of public engagement in the UK. It co-sponsored the first and second UK national »consensus conferences« – on genetically modified foods and radioactive waste management. A particular development was POST's first-time use of online consultations at the UK Parliament, developed in partnership with committees during the course of an inquiry. POST has also organised public consultation meetings held in the constituency of a Commons Board member.

In 2007, the House of Commons Public Administration Committee recommended that POST should spearhead at the UK Parliament a greater focus on longer term issues. In many ways such a focus has always permeated POST's work, but, in responding to the committee's welcome recommendation, POST has put additional effort into this area, often in collaboration with the UK government's Foresight and Horizon Scanning units.

TOPICS

POST groups its work activities into six main clusters, listed below with example projects. Many of the subjects of POST's attention fall into more than one of these categories.

BIOLOGICAL SCIENCES AND HEALTH

- HIV – Developments in Prevention and Treatment
- Review of Stem Cell Research

ENVIRONMENT AND ENERGY

- UK Drought Resilience
- Bioenergy

PHYSICAL SCIENCES, ENGINEERING AND IT

- ICT for Disabled People
- Open Source and Open Standards

SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

- Water Adaptation in Africa
- Deforestation

Also falling within this cluster is a special major project that POST has been running since 2007 concerned with science and technology capacity building in African parliaments, especially the parliament of Uganda. Much of this work has been in collaboration with the UK's Royal Society. Further details are on POST's web site. The Commonwealth Scholarship Commission has also provided fellowships to enable African parliamentary staff to spend three months with POST and the Houses of Parliament.

SCIENCE POLICY

- STEM (Science, Technology, engineering and Mathematics) Education for 14–19 Year Olds
- Science in the New Parliament – a special briefing produced for all parliamentarians after the May 2010 General Election in the UK.

TARGET GROUPS

The primary target for POST's activities is individual members of either of the two Houses of the UK Parliament. Parliamentary committees of either House (sometimes, joint committees) are another important target. POST also engages extensively with government departments and the wider scientific and technological communities within the UK and overseas, while strictly maintaining its parliamentary independence. Part of its role is to demonstrate to these interests that the UK Parliament possesses the analytical capacity that is POST.

All POST publications are also made available to the public at large and are used extensively in higher and further education curricula.

COMMUNICATION AND PUBLICATIONS

Most of POST's publications take the form of one of its well-known four-page »POSTnotes«. After considerable experimentation, this format was chosen largely because busy parliamentarians do not have the time to read lengthier documents. A great deal of effort is put into compressing information into this limit, and in meeting the challenge of making a publication at the same time accessible to non-specialists but commanding the approval of experts in the field. Several other parliamentary TA units have adopted a similar style of summary as part of their publication programme – and POSTnotes have even been translated by them for circulation in their own countries.

POST also produces longer reports. The most recently published was on »Living with Environmental Limits«, while an ongoing longer report is a »Decadal Review of Stem Cell Research«, examining developments in the area over the past ten years, as recommended by a special House of Lords committee that reviewed regulatory legislation. Even with these long

reports, one or more »POSTnote« style summaries is produced to make the key findings accessible to those who cannot examine the main report.

All POST publications are subjected to extensive external peer review by government departmental, academic, enterprise and NGO specialists before release. This is a key feature of POST's publication process.

Either at the start of a study, during its course, or after publication, POST frequently organises parliamentary seminars to discuss its studies. These are complemented by other conferences and workshops. Recent examples include sessions on the Future of Food and Farming and on the Implications of the Fukushima Dai-ichi Incident. Both filled some of the largest meeting rooms in the UK Parliament to capacity.

POST also collaborates with external organisations to hold interactive exhibitions and presentations at the UK Parliament. Notable recent events have covered the future of energy research; robotics futures and polar research.

POST was a founding member of EPTA and has always enthusiastically participated in its activities. POST has been honoured to be approached by countries such as Chile, Japan, Norway and Sweden that were considering creating a parliamentary TA function. POST has also worked closely with the Science Policy Division of UNESCO in its work programme on Science, Technology and Parliaments.

IMPACT

Impact is difficult to assess due to the logistical and administrative obstacles encountered when attempting to survey or interview Parliamentarians, together with the fact that POST is one of many organisations delivering commentary on scientific issues. Nevertheless, some POST qualitative and quantitative data on POST's impact is available and indicates that POST is a valued organisation. POST is currently developing more systematic ways of gathering and analyzing such data.

Around 220 MPs, 170 Peers, 10 MEPs, 44 MP researchers and 160 other parliamentary staff have »opted in« to receive copies of all POSTnotes. Those who are not on this mailing list still routinely pick up POSTnotes from the parliamentary libraries. Anecdotal reports indicate that Members are often seen holding and using POSTnotes in the debating chamber.

POSTnotes are particularly valued for their impartiality. In a survey conducted in 2009 one MP commented »There is so much depending on scientific judgements and scientific information and often it appears in the media as a particular slant, the key thing is that POST is independent and I have to say that I read their publications and I think they are excellent, just the right length and they are impartial and they are clear and I think it is excellent to have that«. The same survey indicated that over 80 % of parliamentarians (out of a sample of 50) had used POSTnotes more than once in the past year.

In many cases POSTnotes are used to inform the work of Parliamentary Select Committees – for example POSTnote 368 on Rare Earth Metals was used to inform an inquiry into Critical Mineral Resources by the House of Commons Science and Technology Select Committee.

POSTnotes are also often incorporated into »debate packs« which are information packs provided to Members prior to a debate.

POSTnotes are known to have considerable impact outside Parliament. This is indicated by download statistics, which show that POSTnotes usually account for around a third of all downloads from the Parliamentary website. Each month at least one POSTnote features among the top 5 most downloaded documents. POST also over 1,200 followers on twitter, a number which is rapidly growing, although only a small proportion of these are Members of Parliament. It also has a newsletter which has over 3,500 subscribers.

THE WAY AHEAD

POST is unlikely to see any expansion in its permanent staff numbers in the near future but its intake of parliamentary fellows has been increasing as new sponsors come forward with collaboration suggestions.

POST is currently putting considerable emphasis on targeting its output to the interests of specific groups of Members of Parliament by using geographical information on the characteristics of their constituencies. Members of the House of Lords do not have constituencies but POST is using other means to identify where they have geographical interests. A good example is the recent POST publication on Anaerobic Digestion. A database is available giving the location of the 60+ digestion facilities open or planned in the UK. By matching these to Members' constituencies, POST has been able particularly to target the publication to their interests.

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AUSTRIA – THE INSTITUTE OF TECHNOLOGY ASSESSMENT

As in many other countries in Europe, the discussion about the social consequences of new technologies – and hence also about TA – began in Austria around the middle of the 1980's. It was in 1984 that TA was first perceived, at least conceptually, by Austrian technology policies and that the question of the establishment of an »OTA for Austria« was first raised.

INSTITUTIONALISATION

Finally, in 1985, a small working party was founded at the Institute for Socio-Economic Development Research at the Austrian Academy of Sciences (ÖAW) around Ernst Braun, formerly the head of the Technology Policy Unit (University of Aston), giving rise on 1.1.1988 to the Technology Assessment Unit (FTB), which later, on 1.1.1994, became the Institute of Technology Assessment (Institut für Technikfolgen-Abschätzung, ITA). Ernst Braun left Austria as director in 1991, and was succeeded first by Gunther Tichy and then, in 2006, by Michael Nentwich. The ITA is an associate member of EPTA and a founder member of the NTA (network of the German speaking TA community).

ORGANISATION AND RESPONSIBILITIES

The ITA is a research unit of the ÖAW, which for its part is one of the largest non-university research institutions in Austria with a particular focus on basic research. In accordance with the interdisciplinary approach of TA, the ITA was set up as an institute of the »Academy as a whole«, not related to one of its two multidisciplinary chapters. The ITA is advised and supported by an international scientific advisory board (SAB) and is evaluated externally at six yearly intervals. Currently, the ITA has around 20 employees. Its work is financed by the Ministry of Science through the ÖAW and, accounting for roughly one third of the budget, by third-party funds (e.g. the Research Fund, various Austrian ministries, the EU etc.). The overall budget runs to around 1.5 million EUR.

FINDING TOPICS

As a scientific research institute, the ITA is relatively free in setting its focal points and determining its topics. The framework is formed by the medium-term research programme, which is updated on an annual basis by means of an internal meeting in which the future topics are presented by the individual researchers and discussed in the group. The decision-making meeting is preceded by a monitoring process which, while being immanent in daily work at the ITA, is intensified during the period preceding the updating of the research programme. The programme determined in this way is submitted to the SAB, which can propose adjustments.

WORK PROCEDURES AND METHODS

As a scientific TA institute, the ITA is largely committed to classical TA, with its emphasis on expert orientations. Typical methods therefore include interviews with experts, and literature and document searches. The increasing integration of value-laden issues into TA projects is also leading to the increased use of participatory methods in TA. The ITA has taken note of and theoretically analysed this development, and since 2007 has also been using participatory elements and methods in its projects, ranging from focus groups and scenario workshops to citizen conferences.

TOPICS

The current medium-term research programme 2012–2014 defines three major research areas, namely the information society, governance of technology controversies, and technology and sustainability. Besides its thematic research areas, ITA focuses on cross-cutting issues, e.g. monitoring and horizon scanning activities as well as critical reflection on and further development of TA methods.

In the »Information society« area, ITA addresses three topics. E-governance deals with the potential of ICT in the field of the state and its effects. The analyses initially concentrated on the launch of electronic administration (e-government) and currently focus on the potential and obstacles of online political participation, which can be ascribed to the overall concept of »electronic democracy«. In the topic »Privacy« the network of relationships between technologies, fundamental rights and social/political consequences is analysed as a basis for deriving options for action. The analysis takes the effects of new and future ICT on the private sphere as its starting point and core. In a broader perspective, however, the ITA also addresses other fields of technology and other basic rights affected. In the third subtopic, »Networked environments«, the ITA deals in particular with the social consequences of pervasive computing and ambient intelligence and with the effect of the use of new media on geographical and social structures and modes of work in science, most recently specifically in connection with Web 2.0 (cyber science).

The field of »Governance of technology controversies« studies controversies about new technologies and their significance for the governance process. Technology controversies have left deep traces in modern society. Disputes concern not only specific applications (such as in agro-biotechnology) but also what and how research and development are to be pursued (for instance with respect to stem cell research). Current topics in this field are nanotechnology and synthetic and system biology.

In the field of »Technology and sustainability«, against the background of the social discussion concerning concrete problems such as climate change or resources shortages and the problems these give rise to, the ITA examines and evaluates the possible consequences of technology, and investigates the conditions under which technology can make a contribution to sustainable development. Current projects address energy technologies in particular.

TARGET GROUPS

As a political and advisory instrument, the aim of TA is not only a reflective analysis of social changes that result from technological innovations but above all the provision of information and advice to decision-makers. The possible technology-policy actors in the public sector include Parliament, the administration, federations and other public institutions, and the ITA has conducted work for all of these.

As occurred in a number of other European countries, the ITA also worked directly for Parliament in the early days of its existence. The reasons why this institutionalisation of TA at Parliament was not continued are to be found both on the level of actors and financing. Furthermore, there is also the legitimate question of whether Parliament is the »right place« for technology policy discussions and decisions within Austria's realpolitik structures. There are, however, links to Parliament at personal level, since ITA staff is regularly invited as experts to Parliamentary hearings. Since 2007, these relationships have again been cultivated more intensively. Thus in 2008, an information discussion was held in the National Council concerning the possible parliamentary institutionalisation of TA. In 2009, the ITA had the opportunity to present itself in detail to the Committee for Research, Innovation and Technology. Representatives of all parties welcomed a closer cooperation between Parliament and the ITA. Since 2011 the self-description of the Parliamentary committee of Research, Technology and Innovation includes a direct reference to TA; negotiations regarding a closer relationship between Parliament and ITA are under way.

Otherwise, in accordance with technology policy reality in Austria, the ITA focuses its main attention on those elements of the administration that are in close proximity to the political actors through the provision of advice to various federal ministries and the Council for Research and Technology. Furthermore, ITA addresses at the international level the EU, and in particular the European Commission and, most recently, the EU Parliament within the framework of the European Technology Assessment Group (ETAG).

COMMUNICATION AND PUBLICATIONS

All ITA research reports are available free of charge via the Internet. In addition, the Institute has published a quarterly newsletter for over 10 years, which is received by several hundred subscribers in Austria and abroad. With active PR work it is attained that the Institute and its topics and projects are continuously present in Austria quality media (press and radio). In addition, the ITA organises regular conferences and lecture events, and is active on the Internet. The latter includes not only the Institute's homepage with extensive information and download material but also the use of new communication forms such as microblogging (Twitter), a presence on Web 2.0 platforms (Facebook, Academia.edu) and in encyclopaedias developed by the online community (Wikipedia).

IMPACT

As an academic TA institution, the success of ITA can be measured in the number and quality of publications in academic journals and books (preferred peer-reviewed, English-speaking), of oral presentations at conferences (preferred invited keynotes at international events) and of third-party funds raised (preferred competitive grant research). These performance figures are core criteria in the annual reporting, the assessment by the Scientific Advisory Board and the regular evaluation teams. In addition, the number of popular science talks and publications as well as the media resonance is being reported.

Measuring the political impact of ITA's studies is more difficult, as many studies (e.g. EUROpTA, TAMI) showed: sometimes a direct relationship between a project or its conclusions and a political decision can be established, but usually this is not the case. Nevertheless, ITA strives for such impact and tries to follow-up on results, though not always as systematically and actively as possible (there is certainly room for improvement). An indicator for success of ITA projects has been the capability to integrate TA results into the decision-making process at an early phase of the development of national and EU research programmes (AAL-benefit, EU Environmental Technologies Action Plan, EU Security Research Programme etc.).

THE WAY AHEAD

Since it was founded more than 20 years ago the Institute has established itself as an important network node of the European TA scene. One of the daily challenges is to walk the difficult line between TA's aim to make a contribution to compatible forms of technology in the sense of providing political and social consulting on the one hand, and the institutional status within a research body that is committed to (application-open) basic research and demands scientific excellence on the other hand. Budgetary problems in the basic funding, which have led to an increased pressure for third-party funds, have so far been overcome thanks to the high level of international networking and the large demand for TA expertise within the ministries. A major chance for the future is to develop the hitherto weak relationship with the Austrian Parliament.

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COUNCIL OF EUROPE – THE PARLIAMENTARY ASSEMBLY OF THE COUNCIL OF EUROPE

INSTITUTIONALISATION

On May 5, 1949 ten Governments[2] signed in London the Statute of a new kind of European organisation, the Council of Europe, with two main statutory bodies: the Committee of Ministers (a conventional ministerial organ) and the Parliamentary Assembly, representing the political forces in the Member States.

The Parliamentary Assembly of the Council of Europe (the Assembly) is the oldest international parliamentary Assembly with a pluralistic composition of democratically elected members. It is also the most comprehensive European parliamentary forum, today with delegations from 47 national parliaments (plus 3 delegations holding observer status).

The Assembly consists of 318 elected representatives (and an equal number of substitutes) from the Member States of the Council of Europe. The number of representatives from each country varies from eighteen to two depending on its population.[3] They must be elected or appointed from among the members of their national or federal Parliament. The balance of political parties within each national delegation must ensure a fair representation of the political parties or groups in the respective parliaments.

At present, the Assembly counts five political groups: the Group of the European People's Party (EPP/CD); the Socialist Group (SOC); the European Democrat Group (EDG); the Alliance of Liberals and Democrats for Europe (ALDE); and the Group of the Unified European Left (UEL). Political groups have to commit themselves to respect the promotion of the values of the Council of Europe, notably political pluralism, human rights and the rule of law.

The President of the Assembly and the leaders of the groups form the Presidential Committee of the PACE.

The President, twenty Vice-Presidents, the Chairpersons of the political groups or their representatives as well as the Chairpersons of the general PACE Committees or their substitutes make up the Bureau of the Assembly.

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2 These were: the five members of the Brussels Treaty, i.e. Belgium, France, Luxembourg, the Netherlands and the United Kingdom, as well as the Governments of Denmark, Ireland, Italy, Norway and Sweden.

3 Parliamentary delegations with their number of representatives: Albania (4); Andorra (2); Armenia (4); Austria (6); Azerbaijan (6); Belgium (7); Bosnia and Herzegovina (5); Bulgaria (6); Croatia (5); Cyprus (3); Czech Republic (7); Denmark (5); Estonia (3); Finland (5); France (18); Georgia (5); Germany (18); Greece (7); Hungary (7); Iceland (3); Ireland (4); Italy (18); Latvia (3); Liechtenstein (2); Lithuania (4); Luxembourg (3); Malta (3); Moldova (5); Monaco (2); Montenegro (3); Netherlands (7); Norway (5); Poland (12); Portugal (7); Romania (10); Russian Federation (18); San Marino (2); Serbia (7); Slovakia (5).

The Standing Committee consists of the Bureau and the Chairpersons of national delegations. It is generally convened at least twice a year and its major task is to act on behalf of the Assembly when the latter is not in session.

The Assembly Committees are composed of representatives or substitutes of the Assembly. They are reconstituted in January of each year, and elect their chairperson and three vice-chairpersons.

At present, the Assembly has 8 committees with the following memberships:

- Political Affairs and Democracy (84 seats)
- Legal Affairs and Human Rights (84 seats)
- Social Affairs, Health and Sustainable Development (84 seats)
- Migration, Refugees and Displaced Persons (84 seats)
- Culture, Science, Education and Media (84 seats)
- Equality and Non-Discrimination (84 seats)
- Honouring of Obligations and Commitments by member states of the Council of Europe, or Monitoring Committee (84 seats)
- Rules of Procedure, Immunities and Institutional Affairs (37 seats)

ORGANISATION AND RESPONSIBILITIES

The Assembly is the driving force of the Organisation in extending European co-operation to all democratic states throughout Europe. It has been behind many of the Organisation's major initiatives such as the European Convention on Human Rights (1950) and the Convention on Human Rights and Biomedicine (Oviedo Convention, 1997). It is consulted about the international treaties drawn up at the Council of Europe.

The Assembly speaks for 800 million Europeans citizens, acting as the democratic conscience of Greater Europe:

- it promotes the development and implementation of the highest standards of democracy, human rights and the rule of law, for the benefit of the peoples of Europe;
- it is a laboratory of ideas and a forum for debates on emerging and topical European issues, and it seeks to identify trends, provide policy guidance, set benchmarks and standards and disseminate best practices;
- it exercises political oversight over the action of parliaments and governments in implementing Council of Europe standards, monitors the situation in Member States and endeavours to help them to honour their statutory obligations.

External relations of the Assembly cover not only national parliaments of member and non-member states, but also international parliamentary assemblies and international intergovernmental organisations. The Assembly has developed its contacts with the European Parliament, the Parliamentary Assembly of the OSCE, the Inter-Parliamentary Union, Benelux, the Nordic Council, PABSEC, CIS and others.

For many years the Assembly has also acted as a parliamentary forum for a certain number of intergovernmental organisations, in particular the OECD, and has developed close relations with specific organisations such as the EBRD and many of the specialised agencies of the United Nations.

WORK PROCEDURES AND METHODS

THE ASSEMBLY' S PLENARY DEBATES

The annual sessions of the Assembly are divided into four part-sessions, each lasting for about a week at the end of January, April, June and the beginning of October. The agenda for each part-session features debates on European and world events, and on key matters requiring action at European level. The Assembly's plenary debates are held in public and they are conducted according to the principles commonly observed in national parliaments.

ADOPTION OF TEXTS

The Assembly can adopt three different types of texts: recommendations, resolutions and opinions.

- *Recommendations* contain proposals addressed to the Committee of Ministers, the implementation of which is within the competence of governments.
- *Resolutions* embody decisions by the Assembly on questions, which it is empowered to put into effect or expressions of view for which it alone is responsible. Most often, they include proposals addressed to national legislatures and European or international institutions.
- The Assembly mostly expresses *opinions* on questions or texts presented by the Committee of Ministers (such as the admission of new member states to the Council of Europe, draft conventions, or the budget of the Organisation).

A two-thirds majority is required for questions such as a recommendation or an opinion to the Committee of Ministers or the adoption of urgent procedure. In respect of a resolution and any other decision, a majority of the votes cast is required.

Recommendations, resolutions and opinions are published in a provisional edition after their adoption. A final version is published after each part-session in the official languages (English and French).

COMMITTEE MEETINGS

Committees meet most frequently either in Strasbourg or Paris, possibly in Brussels when a joint meeting with a body of the European Parliament is envisaged. Committee discussions are generally held *in camera*, but the committee is free to admit anybody to its meeting whom it wishes.

Although committees deal in particular with reports, they have great freedom to discuss any matter within their competence when they agree to do so. They organise hearings, colloquies or conferences on particular subjects, the findings of which can then be used for the preparation of reports to the Assembly.

DRAFTING OF REPORTS

In general, a motion for a recommendation or resolution generates reports. This motion has to be tabled by at least twenty representatives or substitutes belonging to at least five national delegations. It is then referred to a committee for report and possibly to other committees for opinion. The main committee then appoints a rapporteur who drafts a report, into two parts:

- the operational draft resolution, recommendation or opinion and
- the explanatory memorandum.

Both parts are discussed in committee, but only the operational part is voted on. When a report has been adopted in the committee it is tabled for discussion by the Assembly either at a part-session or at a meeting of the Standing Committee.

TOPICS

The Assembly has always paid attention to science and technology and its work also covers topical and emerging issues in the field of science, scientific research, new technologies and their impact on sustainable development and society. These are dealt with by different Assembly committees.

The specific terms of reference of the Committee on Culture, Science, Education and Media[4] includes the task of maintaining working relations with the European Science Foundation and the European Parliamentary Technology Assessment Network. The committee deals with science and scientific research and the impact of scientific and technological development on society. The main focus of its work has been and remains the ethical principles and standards that should govern scientific research and the use of new technologies.

A General Rapporteur on Science and Technology Impact Assessment is appointed among the committee's members with the following main tasks: to follow activities of other Assembly committees and liaise with rapporteurs dealing with scientific and technological matters from other perspectives such as their social, economic, health and environmental impact; to follow activities and maintain working relations with national parliaments as well as with relevant international, intergovernmental, inter-parliamentary or other organisations including the EPTA Network; and to report periodically back to the committee on the information collected and the action taken.

4 This committee resulted from the merger in 2001 of the Committee on Culture and Education and the Committee on Science and Technology.

The Committee on Social Affairs, Health and Sustainable Development deals with health protection and the prevention of health risks; biomedicine, the impact on the environment/ ecosystem of sectoral policies such as transport, energy, water management, and of new technologies such as nanotechnologies or technologies based on electromagnetic waves.

Although the Assembly does not directly implement technology assessment activities, its work in the field of science and technology is founded on the precautionary principle and seeks to promote the highest ethical principles and firm standards of transparency, independence and credibility in assessment, in order to guarantee human dignity and fundamental rights.

SELECTION OF RELEVANT DOCUMENTS ADOPTED BY THE ASSEMBLY

RECOMMENDATIONS

- 1959 (2011) on Preventive health care policies in the Council of Europe member states
- 1929 (2010) on The handling of the H1N1 pandemic: more transparency needed
- 1885 (2009) on Drafting an additional protocol to the European Convention on Human Rights concerning the right to a healthy environment
- 1863 (2009) on Environment and health: better prevention of environment-related health hazards
- 1794 (2007) on The quality of medicines in Europe
- 1787 (2007) on The precautionary principle and responsible risk management
- 1512 (2001) on Protection of the human genome by the Council of Europe
- 1468 (2000) on Biotechnologies

RESOLUTIONS

- 1870(2012) on the need for independent and credible expert assessments
- 1816 (2011) on Health hazards of heavy metals and other metals
- 1815 (2011) on Potential dangers of electromagnetic fields and their effect on the environment
- 1795 (2011) on Genetically modified organisms: a solution for the future
- 1774 (2010) on Enhancing Europe's energy security through greater use of liquefied natural gas
- 1679 (2009) on Nuclear energy and sustainable development
- 1588 (2007) on Radioactive waste and protection of the environment
- 1393 (2004) on Parliaments and the knowledge society
- 1352 (2003) on Human stem cell research
- 1083 (1996) on Parliaments and the assessment of scientific and technological choices

OPINIONS

- 276 (2010) on the Draft convention of the Council of Europe on counterfeiting of medical products and similar crimes involving threats to public health
- 267 (2008) on the Draft additional protocol to the Convention on Human Rights and biomedicine concerning genetic testing for health purposes
- 252 (2004) on the Draft additional Protocol to the Convention on Human Rights and Biomedicine on Biomedical Research;

- 227 (2001)on the draft protocol to the European Convention on Human Rights and Biomedicine, concerning transplantation or organs and tissues of human origin;
- 202 (1997) on the draft additional protocol to that convention on the prohibition of cloning human beings;
- 198 (1996) on the draft convention on human rights and biomedicine;

ONGOING REPORTS

- The ethics of science (Committee on Culture, Science, Education and Media)
- Nanotechnologies (Committee on Social Affairs, Health and Sustainable Development)

TARGET GROUPS

As for all the work of the Assembly, the key target groups are:

- the parliaments and governments of member states;
- the Committee of Ministers of the Council of Europe;
- The European Union and other international organisations (e.g. WHO).

Of course, all the Assembly reports are also intended to reach European citizens, in order to raise awareness and gain their support for policy proposals and guidelines addressed to state authorities.

COMMUNICATION AND PUBLICATIONS

The Assembly's website [http://assembly.coe.int] gives regular information on the activities of parliamentarians, in Strasbourg and on the ground. It includes reports, adopted texts, records of debates and speeches. The plenary sessions are broadcast live.

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POLAND – BUREAU OF RESEARCH

BAS (in Polish: Biuro Analiz Sejmowych) supports parliamentary committees and individual deputies with information, analytical work and expert opinions on all subject matters that are debated by the Sejm (i.e. the first chamber of the Polish Parliament) in the course of legislative process.

INSTITUTIONALISATION

The Bureau was established in 1991 as a unit of the Chancellery of the Sejm – an institution responsible for all administrative and organisational aspects of the Sejm's activities.

The scope of research areas covered by BAS is wide and ranges from constitutional and legal matters, budgetary issues, EU policies and regulations, to variety of social and economic issues. BAS is not a typical TA institute (entirely devoted to TA problems): so far, information on new technologies in general and on technology assessment in particular, represent a small fraction in the scope of BAS' portfolio. However, as the significance of new technologies is more apparent and awareness of their societal and environmental consequences is growing, one can expect that also the Sejm's interest in TA will gradually increase bringing about a greater BAS involvement in TA research.

ORGANISATION AND RESPONSIBILITIES

The main BAS responsibilities include: supporting the legislative process with an expert advice, providing deputies with information and expert opinions and conducting research (in the area of law, economy and society) related to the legislative process. The most expanding area of responsibilities during the last years is the European law and policies (e.g. BAS provides analyses of EU institutions and legislation, for example the Bureau verifies whether draft legislation proposed by deputies is in compliance with EU law). In cooperation with the Sejm committees BAS also organises conferences and seminars.

Currently BAS employs a total of 70 full-time analysts. As the structure of employment reflects the duties performed by the Bureau, the main group of employees are lawyers (45 experts in various law specialities). The rest includes some 15 economists and specialists in such fields as social science, agriculture or environment. BAS also cooperates with numerous representatives of science and with external experts. If, for various reasons, a commissioned work cannot be done within the Bureau, it is then contracted to the external experts.

The Bureau is composed of 6 departments:

- Parliamentary and Constitutional Law Dept.
- Legislative Analyses Dept.
- European and International Law Dept.

- Dept. for Matters before the Constitutional Tribunal
- International Comparative Analyses Dept.
- Social and Economic Analyses Dept.

Currently it is only the Social and Economic Analyses Department that deals with questions on new technologies and TA.

FINDING TOPICS

As a rule the research topics are chosen and commissioned either by parliamentary committees or by individual deputies. The majority of BAS' work is done on request submitted by the two groups of clients. Apart from responding to the parliamentary requests BAS also – on its own initiative – carries out research and policy analysis on topics relevant to the current or forthcoming work of the Sejm. Then the research findings are presented in BAS publications (»INFOS« and »STUDIA BAS«). TA often appears as a component of those analyses.

WORK PROCEDURES AND METHODS

Methods applied by BAS analysts include mostly desk study, interviews and consulting relevant sources of information. Methods involving citizens or any other forms of public consultation are not used. The most frequent outcome is a short information note (several pages) prepared individually by an analyst (BAS prepares 50–100 such notes per month). More profound analyses and reports are less frequent and they may be written individually or by a group of analysts. Standard period for completing a typical assignment is two weeks (much shorter in case of urgency), and one month for more laborious reports.

TOPICS

Most TA work undertaken by BAS in recent years have been done in the following areas:

- Energy and environment – renewable sources; nuclear safety; Carbon Capture and Storage; perspectives of shale gas extraction in Poland; potential for greenhouse gas emission reduction in Poland and its implications for the energy sector.
- GMO and biotechnology – societal, economic and political consequences of biotechnologies and of the widespread use of GM crops.
- Information society – development of ICT in Poland; e-government and the state of online public services; overview of Polish strategies and regulations concerning information society; digital exclusion in Poland (sources of exclusion, social groups mostly endangered by exclusion and its consequences); e-voting.
- Innovativeness of Polish economy – final report will discuss the current state of innovation in Poland, innovation rankings and national and regional innovation policies.
- Climate policy – perspectives for the post-Kyoto agreement, evolution of the EU legislation and domestic action.

TARGET GROUPS

BAS works primarily for the parliamentary committees and MPs. Public participation projects or projects aimed at communication towards broader public have not been undertaken yet.

In previous years several parliamentary committees in the Sejm debated over subjects with an important TA component (e.g. GMO and biotechnology – Agriculture Committee; deployment of nuclear energy – Economy Committee; mitigation of CO_2 emission – Environment Committee) but so far the TA as such has not been in a centre of parliamentary debate. Until recently there was no science and technology committee in the Sejm (such committees are usually the most effective bodies promoting development of parliamentary TA). This situation has changed with the establishment of new standing Committee for Innovation and New Technologies (October 2010). The Committee's main field of interest is promotion of smart economic growth through widespread application of innovation and new technologies. The Committee's agenda includes also some TA issues. One on the first joint projects undertaken by BAS in cooperation with the Committee for Innovation was a debate devoted to digital exclusion and financial services for generation 50+. Recently (January 2012), BAS on the request of the Committee organised a conference on innovativeness of Polish economy.

COMMUNICATION AND PUBLICATIONS

BAS does not publish its TA work in a separate series, TA analyses are usually included within general BAS publication lines, the main are: INFOS (short policy briefs) and STUDIA BAS (compilations of research papers analyzing various aspects of a given topic).

INFOS is a final outcome of a short term project lasting on average 1 to 3 months. They are concise in form and present a single topic related to issues of high relevance to parliamentary debate and/or legislative process. All INFOS papers have standard layout and stick to four-page format. They are published every two weeks, in accordance with the schedule of sittings of the Sejm (20–25 titles/issues a year).

The projects undertaken within STUDIA BAS series are more complex. They involve compiling a book consisting typically of 8–10 research papers devoted to various aspects of a given subject. They are often devoted to sectoral policies (e.g. energy policy, housing policy) or thematic clusters (eg. development of information society). Quite often they adopt comparative approach: comparing relevant data from different European and other countries. There are four issues yearly.

INFOS and STUDIA BAS series are devoted primarily to socio-economic issues, hence TA questions – if they are touched upon – are mostly analyzed in the context of societal and economic impacts. The authors are both BAS employees and selected external experts from leading Polish research institutions.

BAS publications come only in Polish (abstracts are available also in English). INFOS and STUDIA BAS are distributed free of charge to all MPs; additional copies can be picked-up at the BAS inquiry office at the Parliament premises. They are also available online at www.bas.sejm.gov.pl

IMPACT

All the commissioned work as well as BAS publications aim at supporting the legislative process with information and expert analysis. There is evidence they often serve the purpose. Some of the publications with strong TA component (e.g. on energy policy, innovation strategies) have influenced parliamentary debate and attracted media attention. Parliamentary TA and EPTA activities have recently been put on the agenda of the Committee for Innovations and New Technologies.

THE WAY AHEAD

In 2007 BAS became an associate member of EPTA network. This has created an opportunity to learn from and cooperate with more experienced TA institutions, and consequently to strengthen parliamentary TA capacity in Poland. BAS makes a constant effort to explain and promote the concept of TA among deputies. That's why one of the INFOS was entirely devoted to TA theory and practice and its role in decision making. TA studies will continue to play important role in BAS publication lines.

It is hoped the new standing Committee for Innovations and New Technologies, as the main addressee of TA analyses, will help to stimulate further research and TA promotion in the Parliament. BAS is also keen to establish closer relations with academic institutions involved in TA studies in Poland.

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UNITED STATES OF AMERICA – GOVERNMENT ACCOUNTABILITY OFFICE (GAO)

GAO has been providing information and support to the U.S. Congress since 1921. Initially focused on reviewing government expenditures, GAO's role has since expanded and now includes efforts to improve accountability within the federal government by evaluating government programmes and alerting policymakers and the public to emerging problems. At the request of congressional appropriators, GAO began a technology assessments pilot programme in 2001 in order to provide the U.S. Congress with science and technology advice similar to that provided by the U.S. Office of Technology Assessment (OTA), which operated from 1972 to 1995. In 2008, the U.S. Congress asked GAO asked to continue conducting technology assessments as a permanent programme.

INSTITUTIONALISATION

GAO is an independent, nonpartisan agency in the legislative branch of the U.S. federal government – that is, it works for the U.S. Congress. Often called the »congressional watchdog«, GAO investigates how the federal government spends taxpayer dollars and helps improve the performance of the federal government. GAO provides Congress with timely information that is objective, fact-based, nonpartisan, non-ideological, fair, and balanced. All types of work at GAO are conducted under strict professional standards of review and referencing, and all facts and analyses in GAO work are thoroughly checked for accuracy. Types of GAO work include:

- Technology assessments that provide a thorough and balanced analysis of primary, secondary, indirect, and delayed consequences or impacts of a technological innovation on society, the environment, or the economy;
- Performance audits that evaluate how well government programmes and policies are working, and which may contain recommendations for executive branch agencies to act upon;
- Financial audits that provide an independent assessment of whether an entity's reported financial information (e.g. financial condition, results, and use of resources) are presented fairly in accordance with recognized criteria;
- Legal decisions and opinions, such as deciding bid protests.

ORGANISATION AND RESPONSIBILITIES

The Center for Science, Technology, and Engineering (CSTE), which has conducted GAO's seven technology assessments, is located within GAO's Applied Research and Methods (ARM) team. CSTE is jointly directed by GAO's Chief Scientist (Dr. Timothy M. Persons) and Chief Technologist (Dr. Nabajyoti Barkakati), and in addition to conducting technology assessments, the center conducts or supports GAO's performance audits that relate to science and technical

issues and provides other S&T support to GAO as needed. While GAO has a total staff count of approximately 3,000 individuals, as of January 2012, the total staff count within CSTE was 40 technical analysts across a spectrum of disciplines, ranging from physical sciences (physics, chemistry, and geology), engineering, computer sciences, and operations research sciences (cost engineering, earned value management, and schedule risk analysis). When conducting technology assessments, CSTE augments its capabilities by utilizing other analysts in GAO, including individuals with specialized professional knowledge within ARM, such as economists, social scientists, statisticians, methodologists, and data analysts.

FINDING TOPICS

GAO initiates work (including technology assessments) in one of three ways (in order of the priority of the work):

- Congressional mandates;
- Letter of request from senior congressional leaders or a chairman or ranking member of a congressional committee or subcommittee;
- Individual member requests, with additional consideration given to requests from members who are on a committee of jurisdiction.

GAO also initiates work under the authority of the head of GAO (the Comptroller General of the United States) to invest in significant current or emerging issues that may affect the nation's future and address issues of broad interest to the Congress.

When a request for a technology assessment is received or developed through one of these three mechanisms, GAO may begin work on it if staff resources are available and the topic is sufficiently distinct from other work already in progress.

WORK PROCEDURES AND METHODS

Once the decision to begin work on a technology assessment is made, the director of the assessment (the Chief Scientist or Chief Technologist) assembles a multi-disciplinary team appropriate for the topic. At this time, a production schedule is developed by the team that includes estimates for job design, data collection, message development, report drafting, report reviews, and report issuance. This schedule reflects GAO's responsiveness to legislative timelines; our report production is designed to enable issuance within 12 months of job initiation, allowing the reports to be timely and useful to the Congress to support legislative issues, congressional hearings, or testimonies.

GAO technology assessments conducted by CSTE use methodology and data collection techniques that can consist of literature reviews; interviews and document requests from federal agencies, academia, industry, and other stakeholders; the use of groups of experts assembled for GAO through a contract with the U.S. National Academies; workshops, surveys, and focus groups; and analysis of the collected data. Process controls include extensive indexing and referencing of collected information that provide assurance that GAO findings,

conclusions, and recommendations are supported. Draft reports undergo extensive review, both internal and external to GAO; internal stakeholders throughout GAO provide input for technology assessments through all phases of work and review the final product. GAO can use external experts, such as groups of experts assembled by the National Academies, to review the technology assessment draft report. Furthermore, federal agencies that GAO gathered information from have the opportunity to review the draft report and provide comments that are incorporated in the final report.

TOPICS

The range of topics GAO could potentially address for the Congress is quite broad—requests for GAO work can come from any of the 41 active committees and 181 sub-committees within the U.S. Congress which reflect the full range of activities of the U.S. Government. Therefore GAO could be asked to conduct technology assessment work on topics ranging from energy and climate change, biomedical and health, national and homeland security, transportation and infrastructure, and information security concerns, among others.

To date, GAO technology assessments have addressed topics ranging from biometrics to explosives detection to climate engineering. A full list of publicly releasable technology assessment conducted by GAO can be found at www.gao.gov/browse/collection/Technology_Assessment.

TARGET GROUPS

GAO work, including technology assessments, is primarily written to respond to the legal mandate or congressional request that initiated the work. However, GAO reports are also issued to other relevant committees and members of Congress, and in keeping with its mission of accountability, the GAO customarily posts as many of its products as possible on the www.gao.gov website for public consumption and use.

COMMUNICATION AND PUBLICATIONS

Technology assessments conducted by GAO to date have resulted in written products (www.gao.gov/browse/collection/Technology_Assessment). These reports may also contain online-only multimedia components, such as videos/animations or podcasts (for example, the interactive features and additional materials at www.gao.gov/products/GAO-11-71). GAO may also prepare other products, such as congressional testimony, upon request from the U.S. Congress.

IMPACT

GAO's technology assessment products are designed to provide balanced, objective, fact-based assessments of technologies in the context of federal programmes and/or public policy issues. Furthermore, in addition to GAO's broad investigative and audit authorities, technology assessments conducted by GAO can further support the oversight, insight, and foresight functions of the U.S. Congress. For example, technology assessments can provide valuable information to support Congress as it develops policy and allocates funding, particularly in the context of strategic foresight.

THE WAY AHEAD

After receiving direction to establish a permanent technology assessment function, GAO drafted an operational concept memorandum for conducting technology assessments in 2008. GAO is currently reviewing and optimizing its technology assessment procedures and methodologies. Production of technology assessments is likely to remain constant at up to two reports per year, due to current demand and staffing restrictions. Communication with potential congressional requestors is continuing and follows established GAO protocols for interacting with Congress.

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