



Benchmarking Science and Technology Policy

tip Workshop

Venue: Austrian Economic Chamber, Vienna, Austria

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The workshop started with a warm welcome address from *Matthias Weber* (Seibersdorf research) who chaired the Thursday morning session.

The first speaker of the day was *Jean Guinet* (OECD) who explained the OECD approach to benchmarking. In his view, benchmarking serves to identify good policy practices and leads to an improved understanding of political processes. Meaningful benchmarking, however, is more than the comparison of simple indicators: it is a learning process within a shared concept. The aim of the OECD is to stimulate the emergence of a common benchmarking culture in the public sector.

Arnaud Borchard from the European Commission outlined its own benchmarking practices that began in early 2000. It is seen as a learning tool that can help to shape the European Research Area. He identified several fields where benchmarking makes sense:

- Human Resources
- Public and Private Investment
- Productivity of the S&T sector
- Impact of R&D on competitiveness
- Promotion of RTD culture

The main objective of the benchmarking approach is to provide adequate support for policy design. In doing so, benchmarking is an instrument but not an end in itself. Mr. Borchard presented the ongoing EU benchmarking project that covers 32 countries and will be released in 2003. A high level group of experts will ensure the information flow necessary for the success of this process and will also validate the analysis.

Eva Maria Schmitzer from the Austrian Ministry of Transport, Innovation and Technology analysed the benchmarking approach from the administrative point of view. She gave an overview of the main benchmarking exercises since 1972 and commented on the impact they have had on the Austrian policy debate. The findings from several benchmarking studies resulted in a national effort to increase R&D spending to 2.5% of GDP. However, Ms. Schmitzer stressed that achieving this goal is dependent on its receiving the top priority from the government.

The managing director of Technopolis Ltd., *Erik Arnold*, spoke about the “Path Dependency and the Limited Meaning of 'Best' Practice”. He explained that benchmarking initially emerged from an industry context. Private companies have used benchmarking methods to identify improvement opportunities in manufacturing and administration. Benchmarking is most helpful on a very detailed level where complexities are limited. On a systemic level, however, benchmarking can easily run into difficulties. Because of interdependencies between system elements and path dependencies of processes the results of benchmarking exercises need to be interpreted with care.

The afternoon session started with a contribution from *Knut Faegri* (University of Oslo) whose lecture was entitled "Benchmarking Human Resources in RTD". In terms of human resources, he described how the European Union will be able to meet the goals of the Lisbon summit and become the most competitive and knowledge-driven region in the world. Policy makers mainly have to target three fields: the overall research population, science teaching and training and mobility. Five indicators have been developed in order to monitor changes in any of these three fields.

1. Number of researchers in relation to the total workforce
 2. Number of new science and technology PhDs in relation to the population in the corresponding age group
 3. Number of young researchers recruited in universities and public research centres in relation to the total number of researchers
 4. Proportion of women in the total number of researchers in universities and public research centres
 5. Proportion of researchers from other countries amongst researchers in universities and public research centres
- Prof. Faegri pointed out that, while all the indicators sound intuitively very appealing, they should be viewed with caution: For example, does an increase of women in the science sector really mean a catch up of females in that business or does it on the contrary indicate a decline in status of the science system?

The second speaker of the afternoon, the Spanish professor *Gonzalo Leon* (Technical University of Madrid), reported from the “Expert Group on Benchmarking on Public and Private Investment on RTD”. Again five indicators have been proposed:

1. Total research and development expenditure in relation to GDP and breakdown by source of funding
2. Research and development expenditure financed by industry in relation to industrial output
3. The share of the annual government budget allocated to research
4. The share of SMEs in publicly funded R&D executed by the business sector
5. The volume of venture capital investment in early stages (seed and start-up) in relation to GDP

Prof. Leon cautioned that this set of indicators is inadequate for the assessment of the impact of concrete policy. Therefore, benchmarking exercises provide only limited insight into the 'functioning' of a system. He stressed that public policy measures must be considerate of contextual constraints.

Andreas Schibany (Joanneum Research) and *Doris Schartinger* (Seibersdorf research) introduced their case study on science industry linkages in Austria. They gave an overview of a research project within the framework of the EU benchmarking initiative "Benchmarking Europe's Industrial Competitiveness" covering 11 countries. The aim of this study was to compare framework conditions that influence industry-science-relationships. It extended also to identifying major programmes and policy initiatives and depicting 'good practice' examples. The presentation stressed the importance of structural characteristics on the demand side of ISR (the sector composition of national industry, the enterprise structure, absorptive capacities, etc.). Furthermore, major trends and barriers were highlighted in four channels of ISR: Mobility of skilled people, collaborative/contract research, start-ups from public research and patenting at public research. Their findings did not lead to a single best practice model in science industry linkages. Instead, each country has to choose among a variety of measures that suit its individual needs.

In the final lecture on "Benchmarking Information Societies" *Norbert Knoll* (WIFO) looked at benchmarking from a very general view. According to Knoll, benchmarking has become a relatively common tool for performance improvement in the private business sector. Despite different definitions and typologies, all benchmarking practices have several key elements in common. They are systematic approaches and continuous activities aiming to provide the basis for informed decisions. Moreover, they potentially motivate internal change based on learning from external sources (successful practices of others, good or best practice). In reality - even in the business environment -, the shortcomings of benchmarking, such as the tendencies to benchmark quantifiable information and to look at results instead of processes and functions, are obvious. Benchmarking is gaining popularity in the public services and in policy analysis. In many cases a rather 'reduced' approach based on the collection and comparison of indicators – as exhibited in 'performance league tables' and 'scoreboards' is chosen. If benchmarking practices do not improve the understanding of causal connections and interdependencies (e.g. how inputs are transformed into outputs and how different instruments work) as well as that of contextual parameters (e.g. the role of institutional setting), their usefulness is rather limited. Although scoreboards can illustrate a particular situation or development, learning processes require additional inputs. Nevertheless, benchmarking can become a useful tool for policy analysis as two examples from Information Society Policy indicate. The methods employed and the results gained are, however, of a qualitative rather than of a quantitative nature (e.g. using case studies). Moreover, applying benchmarking to areas such as Information Society or Knowledge-Based Economy does not resolve the conceptual difficulties behind these rather visionary terms.

The next day's session started with an introduction from *Wolfgang Polt* (Joanneum Research) who also referred to the tip homepage (www.tip.ac.at), a science and technology information platform for civil servants, policy advisers and public observers.

The first speaker, *Christian Uhlhorn* (German Federal Ministry for Education, and Research) described areas of benchmarking of science and technology policy in Germany. He stressed three main issues, where international comparisons are needed to guide policy: (a) quality, (b) deficits and (c) system. Some examples illustrated the necessity for benchmarking Germany in these fields.

The second speaker, *Louis de Gimel* (French Ministry for Finance and Industry) explained how France uses the European benchmarking exercises to foster its R&D policy. He drew a picture of the development of the french innovation policies from 1998 (innovation symposium) and 1999 (innovation law) up to 2001 (commissioning of the benchmarking scoreboard) with the aim to improve France's position in the European innovation scoreboard.

The third speaker, *Karl Messmann* (Statistik Austria) emphasized four topics: (a) organisational benchmarks, (b) indicators, (c) new/developed indicators and (d) benchmarking tools. He stressed the fundamental improvements the organisation and construction of statistics and indicators have undergone in the last years. Nevertheless, he mentioned some the shortcomings and problems of indicators (e.g. spin-offs) which still require additional harmonization efforts by member states' statistical offices. From a methodological point of view the aim is the international comparability of important R&D indicators.

Josef Mandl (Federal Ministry for Economic Affairs and Employment) defined benchmarking as an instrument for the comparison of performance of both policy-related framework conditions, and the interdependence of policy domains. Although the aim of mutual learning rather than simple imitation is most important, several problems such as the identification of best practice, setting the "right" objectives or ensuring the availability of comparable data has to be addressed.

In the following discussion, *Andreas Fier* (Joanneum Research) asked if a benchmarking of comparable national policies such as the fostering of biotech-regions and start-up initiatives are being benchmarked and whether these benchmarks should not be preferred when dealing with the special problems of national indicators.

Christian Uhlhorn answered that there have been learning effects from the benchmarking of German regions (InnoRegio) as well as from biotech-competitions in the last years. *Josef Mandl* and *Louis de Gimel* took on this suggestion for the EU and mentioned an OECD initiative in this field. *Dasa Bole Kosmac* (Slovenian Ministry for Education and Sports) gave an overview of the Slovenian activities in benchmarking. Slovenia ranks itself according to the European scoreboard, using the same indicators as other EU member countries. *Eva Buchinger* (Seibersdorf research) emphasized the function of benchmarking as a tool to "look outside", to gain an overview of different R&D policies and to create a conceptual umbrella for discussion of good practice and policy justification. Other comments emphasized the conflicts of interest which

accompany benchmarking and public R&D initiatives, e.g. between the German science council, public programme managers and the private business sector. *Christian Uhlhorn* indicated that funding decisions are made by experts and in some cases, by panels of scientists. It is not a decision made by a single person or institution, but in many cases a joint decision among different partners such as programme managers, banks and scientists. A new method for making funds more operationalizeable are so called “audits”, which are used in Germany to commit federal government’s programme managers to definite aims.

Wolfgang Polt summarized the main statements and brought the workshop to a close.