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The Impact of International Organisations on National Science and Technology Policy and on Good Governance

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Summary: The paper gives an overview of the development of science and technology concepts within a national context and within selected intergovernmental organisations (Council of Europe, OECD, United Nations, UNESCO and EU). It focuses briefly on the fashionable strive for "Excellence" and attempts to make a linkage with the more recent notion of "Good Governance". Particular attention has been given to the recent EU efforts to develop a new Union-wide common Research Policy in fostering the concept of the "European Research Area". Against this background, some special concerns are highlighted, such as Priority setting in the FP's, 'small countries versus large countries'; Regional diversity of RTD efforts; EU enlargement; pre-competitive research support and the international competitiveness of the EU). The paper concludes by attempting to elaborate a position on three key issues:

1) The degree of influence of international organisations on national Science and Technology Policy setting
2) The dilemma in formulating a common European Research Policy whilst the EU-15 countries are pursuing in essence their national interests ("15+1" respectively "25+1"?)
3) The difficulty in formulating a European Research Policy whilst some of the key actors, i.e. the research-intensive multinational corporations, are pursuing their own globally oriented R+D policy.

Zusammenfassung: Dieser Beitrag gibt einen Überblick über die Entwicklung von Wissenschafts- und Technologiekonzepten im nationalen Kontext sowie innerhalb ausgewählter zwischenstaatlicher Organisationen (Europäischer Rat, OECD, Vereinte Nationen, UNESCO, EU). Er betrachtet kurz das Konzept der „Exzellenz" und versucht, eine Verbindung herzustellen mit dem in letzter Zeit vieldiskutierten Ansatz der good governance. Insbesondere konzentriert sich der Beitrag auf jüngste Anstrengungen der EU zur Entwicklung einer gemeinsamen Forschungspolitik im Rahmen der so genannten „European Research Area". Vor diesem Hintergrund werden einige Bedenken herausgearbeitet, die sich mit folgenden Bereichen verbinden: die Prioritätssetzung innerhalb der Rahmenprogramme (framework programmes, FP), der Kontrast kleiner vs. großer Länder, regionale Unterschiede in Forschung und Entwicklung, die EU-Erweiterung, vorwettbewerbliche Forschungsförderung und die internationale Wettbewerbsfähigkeit der EU. Der Beitrag schließt mit dem Versuch, die dargestellten Positionen anhand von drei Kernproblemen zu umreißen:

1) Der Einflussgrad internationaler Organisationen auf die nationale Wissenschafts- und Technologiepolitik
2) Die schwierige Formulierung einer gemeinsamen europäischen Forschungspolitik während alle EU-15 Länder eigene Interesse verfolgen (Problem verschärft sich durch Erweiterung)
3) Die schwierige Formulierung einer gemeinsamen europäischen Forschungspolitik während Schlüsselakteure wie die forschungsintensiven multinationalen Unternehmen eher ihre global orientierte Forschungs- und Entwicklungspolitik vorantreiben.

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1. Introduction

1.1 The Need for 'Excellence'

This Conference at Jablonna Palace poses some most intriguing questions. They are at the heart of any science policy concept, whether mostly nationally-geared or aimed at bilateral or international execution:

- Is Research Programming for Excellence desirable?
- Yes, of course, it is desirable.
- Is Research Programming for Excellence possible at all? Here we enter into uncharted waters and into a rather philosophical debate.

One could argue that any research activity is almost by definition striving for Excellency. Would any researcher admit that he is striving for mediocrity? How does one know in advance the quality of the findings? Bill Arroll, former EIRMA President and Director of Research of Jos. Lucas in Birmingham, used to say that industrial research is almost like 'professional gambling'. Only when you leave the casino in the morning dust you know if you were excellent. The winner takes it all...

Already more than thirty years ago, the United Nations World Plan of Action had this to say on "Research excellence": "As regards standards of excellence in fundamental research, the most pressing need for developing countries is to achieve a quality of research consonant with the most advanced scientific investigations carried on throughout the world…". As in our days of the EU, the UN recommended more than three decades ago, that "a few national 'centres of excellence' should be created which, for a specific coherent group of disciplines, would set a high standard of scientific and technological workmanship."[1] The UN, unlike the EU today, unfortunately had no funds at their disposal to underpin this recommendation with some form of co-financing.

At the Lisbon Summit Meeting of the European Council in March 2000, Europe's heads of state and of governments declared their intention to make the European Union "the most competitive and dynamic knowledge-based economy in the world by 2010, capable of sustainable economic growth, with more and better jobs and greater social cohesion."[2] To achieve this goal, the European Council has adopted the so-called 'Lisbon Strategy'', a far-reaching agenda combining short-term politi-

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1 United Nations, World Plan of Action for the Application of Science and Technology to Development, New York 1971, p.53.

2 European Union, Presidency Conclusions, Lisbon European Council, 23 and 24 March 2000 http://www.europa.eu.int/comm/off/index/_en.htm

cal initiatives and long-term economic reforms.[3] Research Commissioner Philippe Busquin is seeing the forthcoming Sixth Framework Programme among others points as a deliberate "attempt to establish Europe as a home of world class research".[4] In order to meet the goals of the Lisbon Strategy – and the demands of enlargement – an independent panel set up by the Commission recommended in 2001 inter alia "emphasising excellence and the participation of leading-edge researchers in the EU Framework Programme.[5]

Likewise EU Member States and associated countries have expressed the hope that the creation of the intended European Research Area could be brought about "by keeping scientific quality as the first selection criteria and by improving scientific as well as social, cultural and economic framework conditions".[6]

The EU's Six Framework Programme has introduced as a new instrument for European research co-operation 'Networks of Excellence". How the 'excellence' has been defined and how it should be measured are not spelled out in the EU Working document. Only the intention of these networks have been specified: "Networks of excellence are designed to strengthen scientific and technological excellence on a particular research topic by networking together at European level the critical mass of resources and expertise needed to provide European leadership and to be a world force in that topic."[7]

The intended creation of "Networks of Excellence" seems to have the support of all participating countries. Some of them, e.g. the United Kingdom, are more cautious in this respect. Referring for example to the life sciences, the UK believes 'it may be appropriate for EU level support to be provided for excellence in service provision to the European research community rather than the primary research excellence."[8]

Who decides on "excellence" in scientific research? Is it the Nobel Committee? Is it the number of memberships in prestigious national or foreign Academies of Science held by a distinguished scientist or the number of honorary Doctor Degrees be-

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3 The World Economic Forum is regularly monitoring the Lisbon process: Cf. World Economic Forum, The Lisbon Review 2002-2003, An assessment of policies and reforms in Europe, Cologny/Geneva 2002, see also Communication from the Commission to the Spring European Council in Barcelona, The Lisbon Strategy – making change happen, COM (2002) 14 final, 15.1.2002.

4 CORDIS focus, Busquin sets out new Framework Programme proposals, 12.3.2001, p.1.

5 CORDIS focus, Europe needs more than the RTD Framework Programme, 31.7.00, p. 1.

6 CORDIS focus, ERA must make European research more attractive, says Switzerland, 26.2.2001, p. 4.

7 European Commission, Provisions for implementing networks of excellence, Third edition, 5 August 2002, p.3 (http://europa.eu.int/comm/research/fp6/networks-ip.html).

8 CORDIS focus, UK broadly welcomes the Commission's working plans for future European research policy, 26.2.2001, p 5.

stowed upon him or her? Is the number of citations in international scientific journals a degree of excellence?

In science, in case of doubt, peers know pretty well 'who is who' in their field. 'Peer reviews' are still the best parameters for judging excellence in the 'Republic of Science'. In technological research things seem to be easier. The number of patents is a good indicator for outstanding technological performance. In any event it is the 'market share' of products or processes that decides excellence. Even the development of an excellent innovative product does not necessarily lead to success because of poor marketing or just because of other external factors, i.e. the wrong timing for market introduction.

Governments thus have little direct influence on the quality of research performed in their countries. The same has to be said for the European Commission and the Community funded research. However, national governments have a key role to play when it comes to the provision of boundary conditions within which the national research system operates. The most visible part is obviously the budgetary allocations for Research and Development. The annual publication of the R&D expenditures as part of the GDP of the member states belong to the best sellers in the statistical publications of the intergovernmental organisations.[9] [10]

Ever since the OECD Ministers for Science analysed the "Gaps in Technology between Member States" in the late Sixties of the last century[11], weak investment in Europe's R&D sector in comparison to the US and Japan has been of great concern to governments and industry in the Member States. The issue has never disappeared from the agenda of European Ministers, and arguments on how to 'bridge the gap' are the same today as they were almost forty years ago.[12] This lasting discrepancy ultimately led to the adoption of the so-called 'Lisbon goals' by the European Council in March 2000 to promote innovation and technology in Europe through an agreed increase of the European public and private RTD spending to an average minimum of 3,0% of the GDP (or one and a half times the current level). The Council, consisting of the heads of state and governments, hopes that through such a huge accelerated increase of the public and private R&D enterprise of the individual EU countries, the European Union as a whole will have become „the most innovative and the most competitive region of the world" by the year 2010.[13]

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9 Eurostat publication, Science and Technology, 'Statistics on Science and Technology in Europe', http://europa.eu.int/comm/eurostat.

10 OECD in figures, 2001, Paris 2002.

11 OECD, Gaps in Technology, General Report, Paris 1968; cf. also: Standke, Klaus-Heinrich, Haines, John et al., Gaps in Technology: Plastics, OECD, Paris 1968; Standke, Klaus-Heinrich, Wald, Solomon et al., Gaps in Technology: Pharmaceuticals, OECD, Paris 1968.

12 CORDIS focus, French Secretary of State for industry calls for Europe to tackle innovation 'challenge' of Japan and US, 25.2.2002, p. 4.

13 http://europa.eu.int/comm/research/era/leaflet/en/preface_en.html

The latest available statistical figures show that at 1,86%, the EU-15 still far away from this target and continues to lag considerably behind its competitors in the US (2,58%) and Japan (3,03%). After the intended EU Eastern enlargement, average EU spending will be even lower. The Commission is, of course, not expecting that the increase in European R&D spending (if it were feasible) alone would be sufficient to reach the intended target. The European Research Area should rather lay the foundation for a common Science and Technology Policy across the European countries.

1.2 The Concept of Governance

"Governance" has become a sort of overall-catchword.

International organisations are devoting special activities towards this concept as well as national governments, enterprises and non-governmental organisations:

Under the auspices of the United Nations, the "Commission on Global Governance" has been created. The findings of this Commission have been presented to the UN on the occasion of the fiftieth anniversary of the World Organisation. In 1999, the Commission issued a further report as the United Nations prepared to hold a Millennium Assembly and Summit in 2000.

The OECD has created a special "Global Forum: Government". The Governance Forum aims to strengthen governance structures by promoting institution building and policy reform. According to the OECD this concept is indeed a recipe to cure all the modern diseases of public administration: "Good, effective public governance helps to strengthen democracy and human rights, promote economic prosperity and social cohesion, reduce poverty, enhance environmental protection and the sustainable use of natural resources, and deepen confidence in government and public administration." In an OECD publication, "Governance in the 21st Century", it was argued that the national sovereignty from which national governments in essence draw their legitimacy is gradually being replaced by multilateralism as a contempary form of global governance.[14]

In 2001 the Commission of the European Union published a so-called White Paper "Enhancing democracy: A White Paper on Governance in the European Union". In this document, "Governance" is understood as "the rules, processes and practises that affect how powers are exercised at the European level."[15] In this context, the Commission outlined a new plan to improve governance by using the Internet to

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14 OECD, Future Studies: Governance in the 21st Century, Paris 2001, pp. 57/58

15 Commission of the European Communities, European Governance, COM (2001) 428 final, Brussels 25.7.2001

collect and analyse reactions in 'the marketplace' to discussions of European Union policy.[16]

In June 2001, Berlin was the venue of 14 heads of states and of governments who discussed "Progressive governance for the 21st Century". In addition to common goals at national level, the World Leaders recognised the special obligation of international organisations 'dedicated to many of the key issues: trade, financial stability, conflict prevention, public health, education, labour, environmental protection, economic development.' [17]

As shown by these examples, the term "Governance" is frequently used in a variety of different connotations. What is usually being meant is either a sort of "oversight" to make sure that the institution or corporation is doing what it should, i.e. the kind of governance exerted by a board of directors, or it can refer to the actual "governing" or execution of policy.

In the context of this conference, those who ultimately authorize and fund science should see „governance" as the responsibility of citizens or of legislative bodies to constantly review the conduct of science in their country and be sure it is meeting its responsibilities; that would then indeed be governance.

Against this basically national approach, we have to distinguish regional approaches such as "European governance" and, on a world scale "global governance".

2. The Evolution of Science Policy in the National Context

National Science and Technology Policies combine all factors determining the health and the dynamism of modern national research machineries. And yet it should be said from the outset, in spite of more than forty years of experience in developing national science policies and thus more than forty years of evidence for "best practises", there are no two countries in the world – or no two countries in the EU world – that have adopted the same science and technology policy system.[18]

National policies for science and technology (more shortly, "national science policy") encompass a concept that is still relatively young. It can be traced back to the so-called Bush report "Science – the Endless Frontier" published in Washington D.C. in 1944. Vannevar Bush was a famous scientist-administrator in the 1930s and 1940s. He was the head of the Carnegie Institution in Washington and was a very

16 http://europa.eu.int/comm/internal_market/enupdate/citizen/ipm_en.pdf

17 Berlin Communiqué: Progressive Governance for the 21st century, Berlin 3.6.2001, p.6

18 Cf. UNESCO, National science and technology policies in Europe and North America, Science policy studies and documents Nr. 43, Paris 1979 or the series of OECD Reviews of National Science Policy.

influential advisor to President Roosevelt. His book "Science – the Endless Frontier" not only suggested what the future might bring for society, but also set the basis for continued massive federal funding for basic research at universities. At the same time he laid the foundation for the creation of the Industrial Research Institute Inc., (I.R.I.), an organisation that since 1938 includes the vast majority of the research intensive American industry.[19] Motivated by a recommendation of the Second OECD Ministerial Conference on Science in 1965 as one of the possible measures to 'bridge the technological gap between Western Europe and the US', I.R.I. has given technical assistance for the creation under OECD auspices of its European counterpart, i.e. the European Industrial Research Management Association (EIRMA).

The Science and Technology policy of a given country comprises the set of mechanisms that bring together the national resources, both in financial and manpower terms as well as the related scientific and technological institutions.

There are many explanations of how the SC&T policies should come about. I like the following given by my esteemed friend and former UNESCO colleague, the late Adriano Buzzati-Traverso, who distinguished in essence two types of mechanisms relevant to national SC&T policies:

The first are planning mechanisms, the responsibility of which is to try to ensure that plans for science fit in with overall economic and social plans or programmes; the task of such bodies can include compiling inventories of available resources and co-ordinating the scientific and technological dimensions of the plans of various government ministries and departments.

The second set of mechanisms are those where responsibility lies for taking the major decisions about science, such as how much is to be spent and by whom, and sometimes for ensuring that any decisions made are carried out satisfactorily.[20]

One of the earlier OECD definitions of Science Policy seems still to be valid today: "By a national science policy is meant the deliberate attempt of government to finance, encourage and deploy the scientific resources of the country – trained research workers, laboratories, equipment – in the best interest of national welfare. Such a concept of policy presupposes a recognition of science as a powerful influence on some or many aspects of national life – cultural, social, health, defence, economic etc. – which until recently could not generally be assumed".[21]

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19 Personal information provided in September 2002 by Herbert I. Fusfeld, former I.R.I. President

20 Buzzati-Traverso, Adriano, The scientific enterprise, today and tomorrow, UNESCO, Paris 1977, p.327

21 OECD, Ministerial Meeting on Science, Fundamental Research and the Policies of Government, Paris 1966, p.16.

The actors of science policy are many: scientists, government officers, politicians, science analysts, chancellors, and science policy units of universities, consultants of various kinds, lobbies from the economic and military world, etc.[22] More and more regional interests are challenging central governmental positions. As a consequence – also in the EU – RTD Policies increasingly become part of Regional Structural Policies.

The science policy of governments seems to focus on those activities funded and/or controlled by government. From about the mid-sixties of the 20th century, industrial research has played an increasing role in the S&T activity of many industrialized countries, yet national science policy finds it difficult to include policies that adequately take account of private sector programmes. This may be due to the great difficulty in exercising government influence over private programs, or it may be due in great part to the fact that many people responsible for national science policy are not too experienced with the nature and conduct of private industrial research. Whatever the reason, it would seem critical that with industrial R&D expenditures now reaching about 2/3 of total national expenditures in the U.S. and other countries, S&T policy should place more emphasis on influencing private R&D, not simply on R&D funded by government.)

3. The Evolution of Science Policy within International Organisations

Scientific and technological co-operation on a multilateral scale is a development that started only in the 19th century on themes – today called 'global problems' – such as meteorology, astronomy, and geophysics. 'International Years' for the study of selected scientific problems have been launched, calling for the multilateral co-operation of scientists from different disciplines. For example, the first International Polar Year was organised in 1882 with the active participation of 11 national expeditions and observers from 35 other countries.

Another form of multilateral scientific and technical co-operation was the organisation of international congresses or conferences. The first World Congress of Economists was held in Brussels in 1847, followed by international congresses on agriculture (Brussels 1848), sanitary issues (Paris 1851), meteorological observations on the sea (Brussels 1853), statistics (Brussels 1853), ophthalmology (1857), chemistry (Karlsruhe 1860), geodesy (Berlin 1862), and so forth. International con-

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22 Praderie, Francoise, Science Policy in the United States: Key Elements, Paper presented to the OECD Workshop on the Future of Russian Science and Technology: Problems and Priorities, Moscow, 15-16.12.1998.

ferences have been and continue to be the most visible form of international scientific co-operation.[23]

The desire to institutionalise some of these ad hoc meetings in some sort of permanent platform gave birth to the creation of international organisations. In 1900, on the initiative of the Academy of Science in Göttingen, the International Association of Academies was created which led in 1919 to the creation of the 'Conseil International des Recherches' and ultimately in 1931 to the establishment of the International Council of Scientific Unions (ICSU). At an Extraordinary General Assembly in April 1998 the name was changed to ICSU: the International Council for Science.[24]

Only when the problems posed by the growing importance of science and technology and their impact on national policy became evident was the need felt to discuss such issues within a multilateral organisational framework. For example, when the OECD Ministers responsible for Science and Technology met for the first time in 1963, most countries were represented by the Ministers for Education. When the Ministers met next in 1966, many countries had already formally established Ministries for Science and Technology and in 1968, at the third meeting, practically all had established in one form or another Ministerial portfolios for Science and Technology.

Needless to say, the overall Science and Technology Policy Structure of a given country encompasses many more fields than those covered by the rather horizontally-functioning Ministry for Science and Technology dealing in essence with 'cross-the-border-issues'. Practically all other Ministries with sectoral responsibilities do have influence on science and technology activities in their field of competence, such as agriculture, economy and industry, transportation, telecommunication, defence, health etc.

The international intergovernmental organisations (Germany for example is member of appr. 200 so called 'IGO's) mirror the national governmental arrangements in their structures. Therefore most, if not all of them, do have secretariat and committee structures dealing with science and technology policy issues.

In the next chapters only some of the most relevant of these intergovernmental organisations have been selected within the framework of this brief presentation. A complete picture combining all intergovernmental agencies dealing within their mandate with science and technology policy issues has to my knowledge never been drawn.

As far as the geographic fields of gravity for the various agencies are concerned, inevitably some of them are overlapping.

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23 OCDE, Organisations scientifiques internationales, Paris 1965, p.13

24 ICSU Year Book 2002, Paris 2002, p. 3-4, http://www.icsu.org

The OECD, which can be seen as the pioneer organisation for the development of the notion of science and technology policy, covers 30 of the most industrialised countries in the world, including four of the EU accession countries, i.e. Czech Republic, Hungary, Poland and the Slovak Republic.

The European Union presently has 15 member countries and has opened to all 12 accession countries, as well as to some other industrialised countries such as Israel, active participation in science and technology policy issues characterised by the so-called 'Framework'.

In the early nineties, the Economic Commission for Europe of the United Nations (ECE) abolished its Committee for Senior Advisors on Science and Technology Policy Issues, which was the only Committee during the 'Cold War' in which the industrialised countries from East and West met.

The Council of Europe, as will be described below, has neither the specific mandate nor the capacity to foster in-depth science and technology policy issues.

The countries of the former Soviet Union as well as the countries belonging to former Yugoslavia (with the exception of Slovenia which will join the EU) have at present no intergovernmental common platform on science and technology policy issues outside the United Nations system. The UN and its specialised agencies, to which developed and developing countries alike belong, is predominantly concerned with problems preoccupying the still so-called 'Third World'.

As a consequence, only industrialised countries belonging to the OECD and to the EU presently have access to intergovernmental institutions for dealing with science and technology policy issues.

It seems, however, that both the United Nations and UNESCO have recently renewed their interest in S&T Policy matters. Developing countries in particular may benefit from such new initiatives. The countries belonging to the former Soviet Union as well as the Balkan countries formerly belonging to former Yugoslavia are practically left out from such multilateral debates between industrialised countries[25]

4. The Capacity of the International System to Deal with Scientific and Technological Issues.

Already more than 25 years ago, a national Policy Panel of the United Nations Association of the United States of America chaired by Cyrus R. Vance – who later became U.S. Secretary of State – had this to say: "For some it has been clear that

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25 It is thus welcomed that the OECD has with the Ministry of Science and Technologies of the Russian Federation jointly organised a Workshop on "The Future of Russian Science and Technology: Problems and Priorities", in Moscow on 15-16.12.1998.

advances in science and technology are outdistancing the capacity of existing international organisations to deal with them. The complexity and the interrelated character of scientific and technological issues call for strong and effective international structures; yet no observer of the current international scene can be sanguine either about the ability of present international organisations to meet these new challenges or about the disposition of nation states to submerge their short-run concerns and cooperate in more long-run but urgently needed endeavours."[26] [27]

The situation has hardly changed. On the contrary, since this statement was made the world population has increased by more than 2 billion people.

In their communiqué summarising the results of the 2001 Berlin Conference on "Progressive Governance for the 21st Century" the participating heads of state and of government have underlined their belief "that the strengthening of the international co-ordination and co-operation on issues of global concern can make a significant contribution to reinforcing progressive governance on the domestic level, by ensuring more stable economic conditions and by fostering efforts to build a more even process of globalisation…" .[28]

What is true on a global scale on the level of the United Nations System is equally true on a European scale. The European Commission in a working document entitled "A European Research Area for infrastructures" reached the following conclusions:

- "...there are no co-ordinated mechanisms to assess what the main needs and priorities are in European research. The present structures are 'very complex and uncertain' and 'disciplinary fragmentation makes it extremely difficult to set priorities among infrastructures serving diverse research communities'".
- Europe's voice is fragmented on the issue, lacking a single coherent position.
- Multinational funding mechanisms are difficult to establish, despite the fact that most budgets of key infrastructures lie beyond the means of a single country.
- Distribution of the financial burden is unclear and slow.
- Even when national infrastructures do exist, transnational access to them is still restricted due to user fees for non-nationals. These are further hampered by a lack of critical mass.

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26 Vance, Cyrus R., Preface, United Nations Association of the United States of America, Science and Technology in an era of interdependence, New York 1975, p.6.

27 See also Welfens, Paul J.J. and Tilly, Richard, Globalization of the Economy and International Organizations: Developments, Issues and Policy Options for Reform, in: Tilly, Richard and Welfens, Paul J.J. (Editors), Economic Globalization, International Organizations and Crisis Management, Berlin-Heidelberg-New York 2000, pp. 13-67.

28 Berlin Communiqué: Progressive Governance for the 21st century, Berlin 3.6.2001, p.6

- Furthermore, the full potential of electronic communication networks has not fully been exploited."

Against this sober picture the report recommends: "Fragmentation, both geographic and disciplinary, of funding and policy decisions should give way to greater coordination at European level...".[29] With respect to 'co-ordination' – and this observation is true for co-ordination on the national and international level – my personal experience from numerous years as Chairman of the United Nations Interagency Committee on Science and Technology suggests that any co-ordination without authority on budgetary resources is meaningless. Nobody wants to be co-ordinated unless there are budgetary repercussions.

Therefore, the ultimate question for the capacity of the international system is the amount of funding member states are ready to mobilise for multilateral purposes and put to the disposal of those multilateral agencies originally created to deal with these kind of issues. This bottleneck is the decisive factor for finding solutions to global problems, an aspect frequently debated at G-7 or G-8 summit meetings or for example at the above-mentioned 2001 Berlin High-level-Conference, during the series of World Conferences and by the UN and the specialised agencies. Practically all of the carefully-negotiated "Plans for Action" or solemn great 'Declarations' did not yield the expected results.

5. The Role of 5 Selected International Organisations in Science and Technology Policy Making

5.1 The Council of Europe

Among the first of the international organisations created after WWII that incorporated the notion of science into its charter and into its work programme was the Council of Europe. The primary objective of the Council of Europe, created in 1949, was to 'encourage the co-operation of Member States in legal, social, administrative and scientific matters."

The Parliamentary Assembly of the Council of Europe – in which the national parliaments of the 41 Council of Europe member states are represented – regularly adopts resolutions relating to science and technology policy.

In 1984 the Council of Europe organised its first Ministerial Conference on Science in Paris. Within the deliberations of the European Union at the Lisbon Summit call-

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[29] ftp://ftp.cordis.lu/pub/improving/docs/infrastructures_sec_2001_356.pdf

ing, inter alia, for the creation of a European Research Area, it is often ignored that almost twenty years earlier, the Ministers of Science of the Council of Europe in co-operation with the European Science Foundation had already called – although in vain – for the "establishment of a European Science and Technology Region".[30] [31] In this context it is worthwhile to recall that as early as in 1967, Harold Wilson, the British Prime Minister, who had filed at that time the second application of the U.K. to join the European Economic Community, launched the notion of a Technological Community of Europe". What Mr. Wilson had in mind "was not merely the growth of common institutions which are able to influence the course of events, but also the way in which people brought together by common problems find themselves persuading each other to behave differently…"[32] As many other visions and worthy ideas, neither Harold Wilson's proposal nor later that of the Science Ministers of the Council of Europe could immediately yield sufficient support for their proposal. But in hindsight it can be said that not only were the OECD's Science Ministers inspired by Mr. Wilson's thinking when carrying out the series of studies on the "Gaps in technology between Western Europe and the United States"; much later in Lisbon the European Union picked up – in a modified form – the idea of a "Technological Community of Europe". The same is true for the ideas formulated for the first time in 1984 by the Council of Europe calling for the establishment of a European Science and Technology Region, which in essence were integrated into the Lisbon Strategy of 2000. And yet, in a time of increasing globalisation, the idea of "European Science" and "European Technology" makes less sense today than at any period before.

Although the Council of Europe was instrumental in launching such initiatives as the creation of CERN in the year 1953, the Council seems to have ultimately played a rather marginal role in the field of science and technology policy in comparison with other agencies. However, in an attempt to respond swiftly to the new challenges brought about with the break-down of the COMECON, the Council of Europe was ready to offer an innovative platform for debating Science and Technology Policy among its (at that time predominantly West-European) Member States and the countries from Central and Eastern Europe including the European countries of the former Soviet Union.[33] This initiative was bypassed when the

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[30] Bernhardt, Simone, Scientific co-operation within the Council of Europe, in: Standke, Klaus-Heinrich (Editor), Science and Technology Policy in the Service of a Greater Europe, Frankfurt/New York 1994, p.76.

[31] A similar proposal was made already in 1972 by the "Budapest meeting" of Experts on Science Policy selected by the Governments of the European Member States of UNESCO, European scientific co-operation: priorities and perspectives, Science policy studies and documents No. 30, Paris 1972.

[32] Mr. Wilson's dowry, NATURE, Vol. 214, may 13, 1967, p. 643

[33] Standke, Klaus-Heinrich (Editor), Science and Technology Policy for a Greater Europe, Frankfurt/New York 1994

European Union presented the so-called 'European Agreements' as a first step for the EU-Eastern Enlargement. It left out, however, practically all countries of the former Soviet Union – with the exception of the EU candidate countries Estonia, Latvia and Lithuania – as well as the countries of former Yugoslavia – with the exception of Slovenia. Although some special arrangements have been made for this group of countries, e.g. enbling them to participate in the Framework activities of the EU, they are presently not actively involved in the STP deliberations of the Western industrialised countries.

5.2 The OECD

The foundation of the multitude of scientific and technological policy activities of the Organisation for Economic Co-operation and Development (OECD) was already laid immediately after WWII in 1948 with the creation of the Organisation for European Economic Co-operation (OEEC), the primary task of which was to manage the economic aid provided under the Marshall Plan. Already at that time a group of scientists advised the OEEC "…at that time of capital shortage and reconstruction to concentrate not on research as such, but on the inculcation of a scientific attitude within industry and other elements of the economy. This urge gave birth to the European productivity movement…"[34] The European Productivity Agency of the OEEC – supported by a Committee for Applied Research was the first multilateral machinery for scientific and technological policy concerns. In 1959, an OEEC mission visiting most member states concluded that the decline in the relative importance of Europe in the world economy could only be met by the "most energetic application of science to economic growth" and furthermore: "The first thing should be for each country to draw up a national science policy". Essentially by this, a resource investment policy was meant, but one which took into account the need for a proper balance between fundamental and applied research, which concentrated on science as the basis for technological innovation and economic growth".[35]

Of all international agencies, the OECD has probably had the most influence on the science policy setting of member states and even beyond that.

For almost four decades after the first Ministerial meeting of the OECD Ministers in charge of Science in 1963, there have at regular intervals been Meetings of the Science Ministers, but almost more importantly, unlike e.g. UN, UNESCO or for that matter, the Council of Europe, the OECD setting has allowed the introduction, at

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34 King, Alexander and Gass, James R. , Science and Education in OECD, in: OECD Observer, Special Issue on Science, February 1966, p.23.

35 idem, p. 25

ministerial level, into the deliberations of economic notions, of the issues of technology, employment, information technologies, international competitiveness, the interaction between R&D and international investment, educational aspects etc. The OECD has also since the early 90s given special attention to the needs of the so-called transition countries.[36] Some of them, i.e. the Czech Republic, Hungary, Poland and the Slovak Republic, have been admitted to the OECD as full members.

Unlike the EU, the OECD cannot provide funds for the implementation of the concepts it has developed. This is left up to each member state.

As a sort of "think tank" of the 30 most developed countries, the OECD publishes not only the results of its Ministerial and expert meetings for a wide dissemination "to whom it may concern", but provides other relevant documents.

On Science and Technology Policy issues and on the relevant Statistics, the OECD issues:

- A series of "Reviews of National Science Policy" succeeded by
- A series "Science, Technology, Industry Review"
- Biannual "Main Science and Technology Indicators"
- OECD Science, Technology and Industry Scoreboard
- OECD Basic Science and Technology Statistics

In addition there is a variety of studies on special issues cutting across the entire range of socio-economic science and technology related areas.

Besides the already mentioned permanent interaction with other fields of the socio-economic well-being of nations that distinguishes OECD work from many other organisations working in the same field but with another geographical focus, there is another special feature of importance to the interests of the European Science and Technology Community, namely the fact that the OECD also covers the US and Japanese experience. This is an advantage that allows one to see the development of science, technology and innovation issues not predominantly from a European angle.

5.3 The United Nations

On the intergovernmental level, the creation of the League of Nations in 1919 created a permanent platform for governments inter alia for the discussion of common

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[36] The latest of such initiatives was the organisation of the 4th Global Research Village Conference (GRV4) on "The Importance of ICT for Research and Science: Science Policies for Economies in Transition, Warsaw, 10-11.10.2002.

problems in the field of science. In 1922 the Intellectual Co-operation Organisation, the predecessor of UNESCO, was created, in 1924 the Health Organisation – which became the WHO –, the Organisation for Communications and Transit which became the ITU etc.

The League of Nations claimed the mandate to coordinate all international activities, including scientific matters, for which international treaties had been signed. Against this background it is to be understood that the United Nations attempts to assume, like the earlier SDN, the mandate through ECOSOC on the intergovernmental level and through ACC on the inter-secretariat level, to play a coordinating role on all matters regarding science and technology. It is for this reason that the UN took the initiative in launching the first UN World Conference with a considerable scientific content as early as 1948, already three years after its creation: The UN Conference on the Conservation and Utilisation of Resources.

Other UN World Science and Technology Conferences or worldwide Initiatives followed such as:

- The United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (UNCSAT), Geneva, 4. - 20. February 1963[37]. The Conference took place before the massive decolonisation movement that marked the Sixties of the 20th Century. For this reason, only 96 developed and developing countries have participated at UNCSAT;
- The United Nations World Plan of Action for the Application of Science and Technology to Development (New York 1971)[38];
- The United Nations Conference on Science and Technology for Development (UNCSTD), Vienna, 20.-31. August 1979 [39]. UNCSTD was attended by 142 member states.

The need for national science and technology policies was already clearly spelled out by the first United Nations World Conference on Science and Technology held

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37 United Nations, Science and Technology for Development, Report on the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (UNCSAT), Vol. I-VIII, New York 1963.

38 United Nations, World Plan of Action for the Application of Science and Technology to Development, New York 1971.

39 United Nations, The Long Step Forward – The United Nations Conference on Science and Technology for Development, New York 1979; United Nations, The Vienna Programme of Action on Science and Technology for Development, The United Nations Conference on Science and Technology for Development, New York 1979; see also Standke, Klaus-Heinrich, The Prospects and Retrospects of the United Nations Conference on Science and Technology for Development, in: Technology in Society, Vol.1, 1979. Standke, Klaus-Heinrich and Anandakrishnan, M. (Editors), Science, Technology and Society: Needs, Challenges and Limitations, New York, Oxford 1980.

in 1963. It was stressed "(The developing) countries need national science planning bodies just as much as do the scientifically advanced countries, but they cannot wait until a country-wide research system has been built up and is operational and effective…".[40]

Similarly, the United Nations World Plan of Action for the Application of Science and Technology to Development, endorsed and launched by ECOSOC eight years later, in 1971, contained a detailed chapter on: The need for establishing or improving Science and Technology Policy in Developing Countries"[41]

Again eight years later, the United Nations Conference for Science and Technology for Development held in 1979 launched a 'Vienna Programme of Action' demanding in particular measures for "Strengthening the Science and Technology capacities of the developing countries" and referred to this effect, on the national level, on "Scope and dimensions of science and technology policy – Major elements of science and policy for developing countries"[42]

To implement the 'Vienna Programme of Action' developing countries had hoped that substantial new funding earmarked for this purpose could be generated. At one time it was hoped, that 1 billion US$ could be mobilised, mainly through contributions from OECD and OPEC countries. [43]A special "United Nations Financing System for Science and Technology for Development" was formally created but was unable to mobilise any significant funding.

On the UN level, no noteworthy efforts dealing specifically with science and technology policy matters were seen in the last years.

5.4 UNESCO

Signed in London in 1945, the UNESCO charter had almost as an afterthought introduced the "S" for Science in its name.[44]

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40 United Nations, UNCSAT report, op.cit., p. 28

41 United Nations, World Plan of Action for the Application of Science and Technology to Development, op.cit. p 51

42 United Nations, The Vienna Programme of Action on Science and Technology for Development, The United Nations Conference on Science and Technology for Development, New York 1979, op.cit.

43 Compared to the funding of the EU Framework Programmes in the amount of 1 billion. The US looks in hindsight rather modest in comparison to the needs of the developing countries.

44 It is an irony of history that high-level UNESCO officials have seriously feared that the consequences of the results of the United Nations Conference on Science and Technology for Development (UNCSTD), held in 1979 in Vienna, might again take the „S" off in UNESCO's name since the developing countries wanted to concentrate the UN systems science and technology un-

It was at the UNESCO General Assembly in Florence in June 1950 that the US Delegate, the later Nobel Prize winner Isidor I. Rabi, declared that after economic aid (through the OEEC) and military Cooperation (through NATO) the time had now come for the United States to make its contribution to the scientific renaissance of Europe.[45]

The creation of the United Nations Advisory Committee for the Application of Science and Technology to Development (ACAST) was one of the practical results of the Geneva UNCSAT of 1963. Rather early in its activities ACAST has recognised the need for national science and technology policy making and has allotted to UNESCO the task of introducing the concept of a national science and technology policy for member states.

For obvious reasons, mainly geared towards the needs of developing countries, UNESCO has developed its own "School of thought" over many years and has launched a 'systems approach' on science and technology policy. Of course, tailor-made solutions for the scientific policy-making of countries cannot be offered, and there was criticism concerning a too technocratic approach. No wonder, the same criticism can be heard today about the EU's efforts at launching a harmonised European Research Policy. And yet, there are also defenders of the UNESCO approach: „The UNESCO preaching of supply oriented strategies of education and R & D promotion, which are often now criticised, in reality reflected objectively the demands of the period when most developing countries needed to build their national infrastructures from scratch not only in science and technology but also in the wider endeavours of creating nation states."[46]

In two rounds of regional ministerial conferences covering each continent, UNESCO was able to bring about a higher degree of awareness for the need to formulate science and technology policies to be considered as a structural policy allowing for the making of an essential contribution towards national development.

Within this series of Regional Ministerial Conferences on Science and Technology Policy two were devoted to the European region:

The First UNESCO Conference of European Ministers Responsible for Science Policy (Minespol I), Paris, 21 to 26 June 1970, covering 44 Member States[47]

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der one roof tied to a new United Nations Financing System for Science and Technology for Development.

45 cf. Gucetti, Luca, A Brief history of European Research Policy, Brussels-Luxembourg 1995, p. 3

46 Galal, Essam Eldin, Development Cooperation in Science and Technology: Changing contexts and emerging concerns, in: German Foundation for International Development, Proceedings of the International Meeting, Feldafing, 23-25.2.1989, Bonn/New York 1989, p. 26.

47 UNESCO, Science Policy and the European States, First Conference of Ministers responsible for the Science Policy in European Member States (Minespol I), Science policy studies and documents, No. 25, Paris 1971.

The Second UNESCO Conference of Ministers Responsible for Science and Technology Policy for Europe and North America (Minespol II), Belgrade, 11 to 16 September 1978, covering 37 Member States[48]

It was hoped by UNESCO "that the Minespol I Conference may be said to have marked the conclusion of the first preparatory phase of a drive toward a co-ordinated European view of science and technology" and furthermore "This was the phase of study of the mechanisms, methods and aims of scientific policies in the two broad categories of socio-economic systems prevailing in Europe; it was a necessary preliminary to co-operation, in view of the profound differences existing between these two systems and the divergences which have kept them apart for so long."[49]

In hindsight, we know that because of the profound differences between the two systems prevailing at that time, the expected "co-ordinated European view of science and technology" was a dream without any political consequence.

Beginning – in parallel with the OECD, but practically without close working relations – with national science policy studies, UNESCO has developed a series of science and technology policy manuals:

- Principals and problems of national science policies (1967)
- Structural and operational schemes of national science policy (1967)
- Bilateral institutional links in Science and Technology (1969)
- International aspects of technological innovation (1971)
- Method for priority determination in science and technology (1978)
- An introduction to Policy Analysis in Science and Technology (1979)
- Manual on the national budgeting of scientific and technological activities (1984)
- Technology assessment: review and implications for developing countries (1984)[50]

Ten years after the United Nations Conference on Science and Technology for Development, (UNCSTD) held in Vienna in 1979, UNESCO organised a "High-level Colloquium from 14 through 16 June 1989 on Science and Technology for the Fu-

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48 UNESCO, Science, Technology and Governmental Policy, Second Ministerial Conference for Europe and North America (Minespol II), Science policy studies and documents, No. 44, Paris 1979.

49 Buzzati-Traverso, Adriano, European Science Policy Towards a Science Policy for Europe, Paper presented to the Third Parliamentary and Scientific Conference, Council of Europe, Lausanne, 11-14 April 1972, PSC (72) Int.Org 5, p.3.

50 see also Standke, Klaus-Heinrich, Technology assessment: An essentially political process, in: UNESCO, impact of science on society, No. 141, pp.65-76.

ture: A Fresh Look at International Co-operation". The primary aim of the event was to take stock of the developments and to seek a better understanding of the objectives, achievements and failures of intergovernmental co-operation in science and technology a decade after the UN World Conference.[51]

At that time, it already appeared that without the expected substantial amounts of additional funding the developing countries hoped to mobilise through the Vienna Conference, the gap between the majority of developing countries and the industrialised world was widening. Another UNESCO effort took place in Berlin in the historic setting of the Reichstag on 25. – 27. September 1990, i.e. one week preceding the Re-Unification of Germany. The idea was to draw the attention of leaders in the international system and of concerned national governments to the serious consequences the collapse of the wall would inevitably have on the survival of the science and technology infrastructure of the COMECON countries. The event was attended not only by the Presidents of national Academies of Science and of other scientific and technological international non-governmental organisations, but also by high-level representatives from the UN system, OECD, EU, Council of Europe, the World Bank and from the private sector.[52]

In order to once again put "Science and Technology" on the World Agenda from which it seems to have gradually disappeared after UNCSTD in Vienna in 1979, UNESCO jointly organised the International Council for Science in Budapest on 26. June – 1 July 2000 in cooperation with the ICSU.

The World Conference on Science (WSC), Budapest, 26 June – 1 July 2000.

The six-day conference, subtitled "Science for the 21st Century: A new Commitment", was attended by almost 1,800 leading scientists, policy-makers and politicians from 155 countries.

WSC adopted two main conference documents:

1) A "Declaration on Science and the Use of Scientific Knowledge" and
2) A "Science Agenda – Framework for Action"[53]

Both documents referred explicitly to Science Policy:

"…National policies should be adopted that imply consistent and long-term support to S&T, in order to ensure the strengthening of the human resource base, establishment of scientific institutions, improvement and upgrading of science education,

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51 Standke, Klaus-Heinrich (Editor), Science and Technology for the Future: A Fresh Look at International Co-operation, UNESCO, Paris, Second Edition 1990.

52 Standke, Klaus-Heinrich (Editor), Science and Technology for the Future of Europe: New Forms of Cooperation between East and West, UNESCO, Paris 1991

53 http://www.unesco.org/opi/science/ nature, A report on the ICSU/UNESCO World Conference on Science, http://helix.nature.com/wcs

integration of science into the national culture, development of infrastructures and promotion of technology and innovation capacities.

S&T policies should be implemented that explicitly consider social relevance, peace, cultural diversity and gender differences. Adequate participatory mechanisms should be instituted to facilitate democratic debate on scientific policy choices. Women should actively participate in the design of these policies.

All countries should systematically undertake analyses and studies on science and technology policy, taking into account the opinions of all relevant sectors of society, including those of young people, to define short-term and long-term strategies leading to sound an equitable socio-economic development…

Governments should support graduate programmes an S&T policy and social aspects of science…".

The Director-General of UNESCO Koichiro Matsuura recently announced that as a follow-up to the WSC, the organisation will reactivate the activities on Science and Technology Policy abandoned for almost a decade. To this effect a Division for Science and Technology Policy has been re-created within the Science Sector. In December 2002 experts in charge of Science and Technology Policy in the most relevant intergovernmental organisations will meet in Paris in order to assess 'state of the art' developments in Science policy formulation within their organisations.

5.5 The European Union

Unlike the other international agencies briefly described in their respective fields of activity on science and technology policy, the European Union is a supranational organisation. Whereas the other organisations can only give council and advice and can offer their good offices to conclude international treaties and binding agreements, the EU member states have delegated to the European Union on certain issues parts of their national sovereignty.

One consequence stems the fact that the EU Commission presides over a budget which is by far larger than the budgetary allocations available to the other intergovernmental organisations.

The Treaty of Rome establishing the European Economic Community had no provision for Research and Development activities. Therefore, the first scientific and technological activities within the Community were carried out by EURATOM, which created a 'Scientific and Technical Committee' and developed a first five-year Research and Training Programme (1958-1962). Only when a Treaty amalgamated the Executives of the three European Communities (ECSC, EEC and EURATOM) in 1967 were RTD activities initiated, a first Commissioner for General Research and Technology, Dissemination of Knowledge, Fritz Hellwig, was

appointed and the first meeting of the Council of Ministers responsible for scientific research was held on 31 October 1967 in Luxembourg.

The European co-operation in the field of Scientific and Technological Research (COST) was initiated in 1971 by a Ministerial Conference attended by 19 European countries.

As in the year 2002 when a call was made for the creation of a "European R&D agency"[54] | a similar proposal was already made in 1971 by Commissioner Altiero Spinelli for the creation of an "European Research and Development Agency" (ERDA). ERDA was meant to be a most ambitious project: On the model of the American NASA, the Agency was to have its own funding in order to directly finance and evaluate projects. These projects might be entrusted to the Joint Research of the EU or carried out at industrial centres in Member States…The creation of ERDA with its financial independence would have increased the Commission's powers, and improve its ability to move rapidly and flexibly, without requiring every single decision to be taken at the Council of Ministers.

But whereas the simultaneously proposed European Research and Development Committee (CERD) was set up on 4.4.1973 with 21 independent members, it was to be a seedbed of ideas and initiatives but without any real powers. ERDA would never see the light of the day."[55]

An 'Action Programme for Scientific and Technological Policy" was first launched by Commissioner Ralf Dahrendorf in 1973.

In 1976 'guidelines for a common research and development policy were defined. In 1983 the First Framework Programme for research and Development was adopted by the Council (1984-1987)[56] Subsequently Five-year Framework Programmes have become a tradition. The Sixth Framework Programme has been adopted by the European Council of Ministers in June 2002.

5.5.1 'European Research Area' and the Vision of an Overall European Research Policy

When he took up his position as European Commissioner for Research in September 1999, Philippe Busquin wanted to give a new momentum to Community Research in developing the concept "Towards a European Research Area". In essence,

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54 CORDIS focus, EURAB member Rolf Tarrach (Spain) calls for united research community and a European R&D agency, 25.2.2002, p. 5.

55 Guzzetti, Luca, A Brief History of European Union Research Policy, Brussels, October 1995, p.49

56 Guzzetti, Luca, A Brief History of European Union Research Policy, Brussels-Luxembourg 1995, p. 49

it is attempting not only to continue the traditional Five-Year Framework Programmes, but in addition

- to reshape the relationships between EU, member states and regions,
- to call not necessarily for additional funding for the EU but instead to make an appeal, launched by the Heads of State on Government at the European Council meeting in Lisbon to increase substantially their national public and private R&D expenditures
- to underpin this concept with a new EU RTD policy aiming at the coordination of all EU-15 national RTD policies.

The project to create a European Research Area which should gradually elevate the European Union by the year 2010," to the most competitive and dynamic knowledge-based economy in the world" is a central part of the 'Lisbon Strategy' adopted by the European Council in March 2000 in Lisbon and reaffirmed by the European Council in Barcelona on 15-16 March 2002. It is not only a challenge. It is without a doubt the most ambitious project the EU has ever undertaken.

In April 2001, the Swedish Prime Minister and President in office during the Swedish Presidency, Göran Persson declared, "In Lisbon we laid the foundations. In Stockholm we built the first of ten storeys…"[57] Today, seven and a half storeys have yet to be built.

In a special "Communication" from September 2002, the European Commission revealed how it sees that the target of devoting 3% of the European GDP for RTD purposes within the envisaged European Research Area will be reached[58].

The proposed 'concerted action' consists of a broad range of initiatives, not the least of which being an appeal to industrial corporations to heavily increase their R&D sector. It is hoped that the private sector will raise its share of European RTD funding from its present 56% to two-thirds of the total European R&D investment.

The Commission realised that in view of the large discrepancies in national R&D spending, the overall objective of 3% cannot be reached individually by all current and future Member States, "but they should all contribute to the effort. They should coordinate their efforts to create a joint dynamic for the growth of R&D investments throughout the Union."

In addition to increased spending by governments and the private sector, the Commission has proposed a set of fiscal measures, public support for risk capital, direct support measures and others in addition to a call for a more friendly innovative eco-

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57 CORDIS focus, Europe must do more to achieve Lisbon goals, say EU leaders, 23.4.01, p. 2

58 Commission of the European Union, More Research for Europe: Towards 3% of GDB, COM (2002) 499 final, Brussels, 11.9.2002

nomic environment allowing entrepreneurship and creativity to flourish better. After a series of discussions with European institutions, Member States, regions and interested parties, including most notably industry, the Commission intends to propose orientations for the European Research Area in the context of a synthesis report to the 2003 Spring European Council.

After the European Council and depending on its results, the Commission will consider proposing a "focused set of prioritised actions supported by a process of open co-ordination".[59]

5.5.2 Special Issues

For discussion purposes, the following chapters contain a number of areas of concern, to a large degree collected from CORDIS focus, in connection with the forthcoming FP-6 linked also to the proposed new EU RTD policy.

Small countries versus large countries

Smaller Member States (and associated countries) have expressed concern that a focus on larger projects and research areas could be detrimental to certain fields and countries. [60] According to the European Science Foundation (ESF), "The rigid application of the principle of large-scale funding may well have the effect of excluding smaller countries from effective full participation in the Framework Programme".[61]

According to a study carried out by the Observatoire des sciences et des techniques of the French Ministry of research, French, German and British teams alone accounted for 46% of all cases of collaboration within FP-5.[62]

a) Regional R&D Diversity in Europe

In an article entitled "Knowledge As a Global Public Good", Stiglitz argued that "innovations (research and development expenditures) are even more concentrated in advanced industrial countries than are incomes and many of the advances in less developed countries consist of adapting the technologies of more advanced coun-

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[59] Commission of the European Communities, More Research for Europe: Towards 3% of GDP, op.cit., p.21

[60] CORDIS focus, Denmark endorses ERA and FP6 proposals but wants more, 26.3.01 p 7

[61] CORDIS focus, ERA should be medium-term policy target – ESF opinion, 2.7.01, p. 5

[62] http://www.obs-ost.fr/pub/PCRD05-11-01.pdf

tries to the circumstances of the developing world."[63] Looking at the ratio of R&D spending in the EU-15 countries on one side and on the group of candidate countries on the other, this observation is equally true for the situation in Eastern and Western Europe. The same striking disparities do exist between different parts of the present EU membership, particularly between the central and peripheral regions, or if one looks at my country, between Eastern and Western Germany.

Achilleas Mitsos, the Director-General for Research of the EU Commission, has made the same comparison as Joseph Stiglitz, not for the Northern and Southern hemisphere of the World, but for the EU: "Research, technology and innovation, whether measured by expenditure, personnel or patent outputs are even more divergent than GDP:

- RTD expenditures and employment are very much concentrated in a band stretching from south and southwest of Germany, Flanders in Belgium, the Netherlands, southeast England and Ile de France. The southeast of France and the northwest of Italy show smaller but significant levels of expenditure.
- At the national level, Sweden's overall expenditure as a proportion of GDP (3,85%) is more than seven times that of Greece (0,5%).
- Germany has almost twice as many research and engineering personnel per thousand labour force as Spain, three times more than Greece and four times more than Portugal.
- Patent applications are similarly concentrated in comparatively few regions, each being specialised in different areas of technology. Twenty times as many patent applications arise from Germany as from Ireland, Greece, Portugal and Spain combined…

The prospect of enlargement adds a further dimension to this diversity. The recent history of the applicant countries is clearly quite different from those of any existing EU member country, and recent history translates into distinctive situations in research. They are in themselves a diverse group of countries, but the evidence is in the dramatic falls in RTD activity which have occurred there since the end of the old regimes."[64]

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63 Stiglitz, Joseph E., Knowledge As a Global Public Good, in: Kaul, Inge; Grunberg, Isabelle and Stern, Marc A. (Editors), Global Public Goods – International Cooperation in the 21st Century, New York- Oxford 1979, p. 312.

64 Mitsos, Achilleas, The Territorial Dimension of Research and Development Policy: Regions in the European Research Area, Paper presented to the Valencia Conference 'The Regions and Research and Development and Innovation Policy: The Challenges and Prospects of Territorialisation, 23.2.2001.

Efforts by the EU to foster "Excellence" in Research

The Sixth Framework Programme aims, inter alia, to create a network of excellence among European researchers. Special attention will have to be given so that the research centres in the candidate countries will be more integrated into the network of the EU-15 countries.

Networks of excellence are primarily designed to overcome the fragmentation of European research. The Commission is expecting that these networks are to be used in implementing the priority thematic areas of the Sixth Framework Programme.

- An essential feature of the activities aimed at spreading excellence will be a joint programme for training researchers and other key staff.
- Other activities to spread excellence may include "dissemination and communication activities (including public awareness and understanding of science) and more generally, networking activities to help transfer knowledge to teams external to the network".
- Another way of spreading excellence could consist of promoting the exploitation of results generated within the network.[65].

To give visibility to the permanent challenge for excellence in research, the EU Commission has established a special Division dealing exclusively with Distinctions for High-Level Research Work.[66] The European Commission supports 3 types of awards, which aim to give public recognition and visibility to European researchers[67]:

1) The Descartes Prize is awarded to research teams for outstanding scientific and technological achievements arising from European international collaborative research.
2) The Archimedes Prize is for undergraduate students of higher education
3) The EU contest for Young Scientists is for young researchers between the ages of 15 and 20. The 14th contest was concluded on 27.9.2002 in Vienna, Austria.

The EU Commission's Enterprise Directorate General has created a 'Club of Excellence" for start-up companies. The initiative called PAXIS has selected 15 innovative economic areas in Europe and clustered them into four thematic networks:

1) KREO: Oxford (UK), Karlsruhe (DE), Lyon-Grenoble (FR) and Emilia-Romagna (IT)

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65 European Commission, Provision for implementing networks of excellence, Third edition, 5. August 2002, p.3/5.

66 http://www.cordis.lu/imroving/

67 http//www.cordis.lu/improving/awards/home.htm

2) HIGHEST: Alpes-Maritimes (FR), Berlin (DE), Helsinki (FI), Malmö (SE) and Torino (IT)

3) SPRING: Stockholm (SE), Cambridge (UK), Stuttgart (DE) and Madrid (ES)

4) PANEL: Munich (DE), Milan (IT) and Barcelona (ES)

5) START: Copenhagen (DK), Edinburgh (GB), Hamburg (DE), Veneto (IT)

6) and Vienna (A).

These regions became members of the 'club of excellence' network. The organisation is aiming to identify existing resources and competencies, to transfer this knowledge, and to exchange and disseminate good practises for promoting innovation throughout the Member States.[68]

With special focus on the candidate Member States, the EU has mobilised € 24 million to support 34 multidisciplinary centres of excellence in 11 countries. According to the EU Commission, together they form 'an advanced platform for integrating their scientific and technological potential in the European Research Area'.[69] Caution, however, should be expressed when the Commission – and not peers from the scientific community – is exercising the authority on handing out the label of "Excellence". The sheer number of 34 will inevitably have some inflationary result on the meaning of 'scientific excellence'.

Special concerns of candidate countries

According to Research Commissioner Philippe Busquin, the extension of the Union to a greater number of extremely diverse countries makes the limits and forms of collaboration the EU has had until now particularly evident as well as the necessity of going beyond simple joint projects.[70]

Enlargement Commissioner Günter Verheugen has felt that the benefits (from FP's) are unevenly distributed (between present members and Candidate countries). "We cannot and we will not accept this". He appealed to the Candidate Countries to improve their negotiation capacities and research infrastructure so they can better benefit from the enlargement process: "We want integration, we want partnership and common benefits. Don't hold back therefore from laying your suggestions on the table, so that we can come closer to this goal".[71]

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[68] http://www.cordis.lu/PAXIS

[69] http://europa.eu.int/comm/research/news-centre/en/pol/02-03-pol04.html 3.4.2002

[70] CORDIS focus, Busquin urges Candidate Countries to use EU financial tools to support research, 11.3.02, p.6

[71] CORDIS focus, Candidate countries share concern and support for FP6 proposals, 30.7.01, p.4

- Candidate countries: FP-6 seven priorities are not the 'most relevant' for these countries

- "If a successful European Research Area (ERA) is to be created, as the Commission is proposing, research capabilities must first be built up within individual countries as 'only by strengthening the research potential at a national level can the goals of a European Research Area be realised to their full potential."[72]

- The Commission called on the Candidate Countries to make greater use of the Phare funds to facilitate their integration into the European research effort, and encouraged the use of all financial instruments of cohesion for the support of research, technological development, technology transfer and innovation.

- Candidate countries have to foster the competitiveness of their economies in preparation for accession.[73]

Mobility = Brain drain?

One of the main features of the policy underlying the call for a European Research Area is the need felt to improve the mobility of researchers in Europe and to eradicate existing barriers to the free movement of researchers. By mobility it is meant both movements between countries (transnational mobility) and between industry and academia as well as between private and public sectors.[74]

When meeting with the Ministers from the Candidate Countries EU Commissioner Philippe Busquin has emphasised that the mobility of researchers between current Member States and the Candidate Countries must be a two-way street, to which the former Polish Research Minister Wisniewski argued that a one-way street would be 'either charity or robbery.'[75]

The Commission is examining the possibility of a research scholarship in this context, covering two years abroad and a third year back in the researcher's home country.

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72 CORDIS focus, ALLEA calls for amendments to proposed priority areas for FP6, 2.7.01 p. 4 All European Academies (ALLEA).

73 CORDIS focus, Report shows candidate countries must work more on entrepreneurship, 28.1.02, p.3 8http://europa.eu.int/comm/enterprise/whatsnew.htm)

74 http://europa.eu.int/comm/research/fp5/pdf/finalreportmobilityhleg.pdf

75 CORDIS focus, Candidate countries share concern and support for FP6 proposals, 30.7.2001, p. 4

6. Conclusions

On the end of this 'tour d'horizon' attempting to highlight some of the developments in the complex field of Science and Technology Policy in the international setting, we have to answer the questions asked in the beginning, i.e.:

1) What has been – or what is – the possible impact of international organisations (if any) on national Science and Technology policy-making and perhaps also on good Governance?

We can also extend the question: To what extent is the formulation of an international science policy, respectively a European Research Policy, possible as long as the science policy is predominantly influenced by national interests?

To make things even more complicated, we must furthermore ask to which extent a national science policy (or for that matter, a regional European Research policy) is possible, at a time of globalisation when many of the key RTD actors – i.e. the multinational corporations which count for the lions share of industrial R&D – are operating outside national and regional borders? In other words, when the bulk of a country's R&D activity is not dependent on government funding.

2) The impact of international organisations on national Science Policy

First and foremost, intergovernmental organisations enable national governments to apply "best practises", i.e. to present experiences gained elsewhere to be adjusted to national needs. As already said, although the problems with which governments are confronted are similar, there are no two countries having adopted the same national science policy. As a matter of fact, I recall an anecdote many years ago, when the OECD had sent a mission to the US in order to evaluate the US national science and technology policy system, my colleague Jean-Jacques Salomon came back to the Château de la Muette in Paris and astonished a curious audience by saying: "There is no such a thing as a US Science Policy". He felt that the country is too large and too diverse to have a single streamlined Science and Technology Policy.

The OECD series of regular national Science and Technology Policy Reviews was certainly one of the greatest achievements of the OECD on that field. It allowed national policy makers to discuss in depth the analysis undertaken by international experts. The conclusions reached were not binding, and yet, they usually had considerable influence on the shape of the national science and policy concept and on the priorities to be given.

In determining the national S&T budget, the 'benchmarking' of national funding efforts with countries in similar conditions, is of the utmost importance. International organisations such as the OECD or the EU provide valuable statistical background data.

All issues of national concern on the science and technology agenda sooner or later come on the agenda of international organisations for debate among the representatives of the Member States. And vice-versa: Problems debated on international plat-

forms will find their way into national debates. In other words, the membership in an international organisation if properly used is a safe insurance to guarantee that the given country is well aware of international trends.

The same can be said for the relatively small group of officials dealing with science and technology policy issues. Their involvement in the international dialogue permits them to be part of an international network of experts, which may facilitate solutions through an informal exchange of experience. Equally the academic world specialising in science and technology policy issues is using the proceedings and publications of international organisations to add to the stock of knowledge in this highly specialised field.

3) To what extent is the formulation of an international science policy, respectively a European Research Policy, possible as long as national interests predominantly influence science and technology policy?

Eugene B. Skolnikoff, a Professor at MIT for many years and member of the White House Office for Science and Technology, has been able to highlight this complex problem with one sentence: "The process that determines the policy of a nation toward collective action, however, continues to be entirely national in structure, giving representation to domestic interests affected by the issue and only indirectly to foreign or international interests."[76] To make things even more complicated, the challenge within Europe for a close partnership in Research and Development with American partners seems for many of the "excellent" R&D performers to have a far greater attraction than a partnership with European partners.

Experience shows that the distance between 'words' and 'action' can only be bridged, if financial rewards are involved. What does the call for a more "coherent European Research Policy" imply? Is there at present any European Research Policy at all? Or is it more fair to speak of a Research Policy of the European Commission, i.e. in the Commission's own words, 'a sort of '16th' research policy, coming on top of 15 national policies'?"[77]

When one looks at the earlier attempts by the Commission, e.g. by Commissioner Altiero Spinelli, to launch an EU RTD policy, it was for obvious reasons never intended to replace research and development policies in the Member States. Instead the Commission should only be in a position to become effectively involved whenever the situation required greater efforts than individual countries could make.[78] It is for this reason that Philippe Busquin frequently refers to the principle of 'subsidiarity' in the European Treaties, i.e. only those issues should be dealt with through

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76 Skolnikoff, Eugene B., The elusive Transformation: Science and Technology and the Evolution of International Politics, Princeton 1993, p.210/211.

77 http://europa.eu.int/comm/research/era/leaflet/en/paradoxe04_en.html

78 Guzzetti, Luca, A Brief History of European Union Research Policy, Brussels-Luxembourg 1995, p. 49

Community actions that cannot be handled by member states on a national scale alone.[79]

A meaningful impact on the direction and on priorities of national science and technology policy making through international organisations can only be reached if funding, or at least co-funding is made available. This very point makes the decisive difference between the science and technology policy advice elaborated on by "Agenda's for Action" at international World or regional Conferences or by resolutions of Ministerial meetings such as the UN, UNESCO, OECD or the Council of Europe.

The European Union, however, as a supranational organisation with a relatively large budget, can indeed influence the orientation of national science and technology policy setting through the "Framework" sequence of multi-year initiatives on Research and Development for example. Since, the European Framework funds are in the order of magnitude of roughly 5 or max. 6% of the R&D public funds allocated by the 15 EU Member States in their national budget, however, the impact of the European Union on the direction of the European Research enterprise is rather modest.

Denmark's minister for science, technology and innovation, Helge Sander, has put this dilemma into the right proportion. He said: "EU-funded research only represents about 5% of Member States' total public expenditure on research. Obviously there are profits to be reaped, especially if we can increase co-operation regarding the remaining 95% as well."[80]

The Commission speaks therefore of the "Puzzle 15+1", i.e. 15 national science policies plus the EU Framework for European research. This puzzle will be called "25+1" by the year 2004, when ten new members have joined to EU.

The United Nations, UNESCO and other agencies of the UN system constantly seek an understanding for the notion that "Science" is a public good: "…in the twenty-first century science must become a shared asset benefiting all peoples on a basis of solidarity…Cooperation between developed and developing countries should be carried out in conformity with the principles of full and open access to information, equity and mutual benefit…Measures should be taken to enhance (the) relationships between the protection of intellectual property rights and the dissemination of scientific knowledge that are mutually supportive." (UNESCO/ICSU WSC Declaration on Science and the Use of Scientific Knowledge).

"Countries that have the necessary expertise should promote the sharing and transfer of knowledge…" (UNESCO/ICSU WSC, Science Agenda – Framework for Action)

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79 Philippe Busquin, Towards a European Research Area, FTE info No.26, May 2000, p.3

80 CORDIS focus, ERA needs defining, says Danish research minister,, 9.9.2002, p. 2

The notion that "Most Knowledge" is a global public good is also supported by the Nobel Prize Laureate Joseph E. Stiglitz, at that time Senior Vice-President and Chief Economist of the World Bank, and yet he acknowledges the right of inventors to enjoy the fruits of their innovative activity over a limited period of time through patent protection. "In return", he argues, "inventors must disclose the details of their invention. But the fact of the invention, let alone the details provided in the patent application, make an enormous amount of knowledge freely available…".[81]

If one regards the notion of "sharing and transfer of knowledge" called for by the UN and by UNESCO outside the field of basic reearch as perhaps too altruistic and too idealistic, one has to note that the concept of the European Research Area seems to be based on the same principles. The note issued by the Commission entitled "What is the European Research Area?" cites seven concrete requirements:

- A stock of material resources and facilities optimised at the European level;
- More coherent use of public instruments and resources;
- More dynamic private investment;
- A common system of scientific and technical reference for policy implementation;
- More abundant and more mobile human resources;
- A dynamic European landscape, open and attractive to researchers and investment;
- An area of shared values

They conclude by stating, "Openness is the key: Underlying all of this are the concepts of sharing and exchange. Clearly, European researchers must learn to stop thinking of themselves as living and working separately in individual states and to be more open and communicative about the results of their work."[82]

At present in spite of the existence of a Single market within the EU, each Member State in essence sees the national Science and Technology policy as an instrument to foster the country's international competitiveness.

For the time being it has to be concluded that the results of fundamental research can be seen as Global Public Goods available to the entire Scientific Community in Europe or worldwide.

The results of applied research, which encompasses practically all industrial research and development, are not public goods. Not even a national government is

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81 Stiglitz, Joseph E., Knowledge As a Global Public Good, in: Kaul, Inge; Grunberg, Isabelle and Stern, Marc A. (Editors), Global Public Goods – International Cooperation in the 21st Century, New York- Oxford 1979, p. 310.

82 http://europa.eu.int/comm/research/growth/gcc/era.html

able to control the dissemination of these results and even less a supranational Commission.

It is for this reason that the Commission is cautious in frequently underlining that the Framework Funding of the EU is only being used for 'pre-competitive' projects. The question of how far the solidarity among European countries and the "European shared values" will go in order to share the R&D resources and their results in the superior interest of the creation of a common European Research Area therefore remains unanswered.

However, perhaps there is a more constructive way to view these facts. Since the principal interest of government in a wise S&T policy is to improve the life of its citizens, usually by stimulating economic growth, then policies that will stimulate increased industrial R&D investment and facilitate the commercialisation of the results should be the main focus for government policies with regard to the private sector. Separate considerations are necessary for factors such as defence needs or environmental and health requirements.

Evolution of Science &Technology Issues on the International Agenda

Science Policy,

Science and Technology Policy,

Science, Technology and Industry Policy,

Science, Technology and the Innovation System,

Science-innovation links,

Science, Technology and Entrepreneurship

Productivity Movement: European Productivity Agency of the OEEC, Paris,

Science, Technology for Economic Growth and Social Development,

Science, Technology and Employment,

Science, Technology and the Environment,

Industry-Science Relationships,

Gaps in Technology,

Science, Technology and International Competitiveness,

Government and technical innovation,

Technology Transfer,

- Science of Science,
- Technological Forecasting,
- Science, Technology and Society,
- „Limits to Growth“,
- „World Problematique“,
- Appropriate Technology
- Technology Transfer,
- Technology Assessment,
- Social Assessment,
- Basic Human Needs,
- Science for the Poor,
- Science and Technology for Development,

- Science and Technology for Sustainable Development,
- Science for Peace and Development,
- Science and Ethics,
- Global Governance,
- Global Change,
- Culture of Peace,
- Global Goods,
- Science and Information Technology,
- Information technologies and “The Global Village”,
- Knowledge Management,
- Knowledge Society,
- Women in Science,
- Megascience,
- Science Education
- Science and Technology Policy Training

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(Selection)

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Commission indépendante sur les questions humanitaires internationals, Sadruddin Aga Khan et Hassan bin Talal) 1988.

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UNESCO World Science Reports 1993, 1996 and 1998.

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