# Science, Technology and Innovation for the 21st Century

# Meeting of the OECD Committee for Scientific and Technological Policy at Ministerial Level, 29-30 January 2004

# Final declaration issued on January 30th 2004

1. The OECD Committee for Scientific and Technological Policy met at Ministerial level on 29 30 January 2004. Mr. Peter McGauran, Minister for Science of Australia, chaired the meeting, with Ms. Claudie Haigneré, Minister for Research and New Technologies of France, and Mr. Jaime Parada Ávila, Director General of the National Commission of Science and Technology (CONACyT) of Mexico, as Vice-Chairs.

2. The meeting was preceded by a High-level Forum on "Key Challenges for Science and Innovation Policy", in which prominent representatives of research institutions and business participated. The Business and Industry Advisory Committee (BIAC) and the Trade Union Advisory Committee (TUAC) to the OECD also held consultations with Ministers.

3. Ministers highlighted the benefits that society can derive from advances in science and technology. They reaffirmed that knowledge creation and diffusion are increasingly important drivers of innovation, sustainable economic growth and social well-being. They emphasised the importance of ensuring the long term sustainability of the research enterprise and the need to involve civil society and business more effectively in the governance of public research.

4. In their discussions, Ministers devoted much attention to three issues that are high on the science and innovation policy agendas of OECD countries: 1) promotion of stronger relationships between science and innovation systems, including the changing role of intellectual property rights in stimulating knowledge creation and diffusion; 2) ensuring sustained development of human resources in science and technology; and 3) global-scale issues that call for enhanced international co operation in science and technology.

5. Ministers encouraged the OECD to strengthen its work on science, technology and innovation, and underscored its relevance to the broader OECD agenda.

Ministers concluded that:

- Changing innovation processes and the evolution of the relative contribution made by the private and public sectors have emphasised the need for strong industry-science linkages. A well-functioning interface between the innovation and science systems is more necessary than ever to reap the economic and social benefits from public and private investments in research, ensure the vitality and quality of the science system, and improve public understanding and acceptance of science and technology and the importance of innovation.
- Patent regimes play an increasingly complex role in encouraging innovation, diffusing scientific and technical knowledge, and enhancing market entry and firm creation. As such, they should be subject to closer scrutiny by science, technology and innovation policy makers.
- Increasing participation and maintaining quality standards in tertiary education in science and technology are imperative to meet growing demand for workers with scientific and technological knowledge and skills. Complementary efforts are needed to improve mobility and the attractiveness of research careers in the public and private sectors.
- Improving the accountability of science and technology policy should usefully be addressed through more systematic evaluation exercises. Additional effort is needed to identify and disseminate good practices in this area.
- Co-ordinated efforts at national and international levels are needed to broaden access to data from publicly funded research and contribute to the advancement of scientific research and innovation. To this effect, Ministers adopted a Declaration entrusting the OECD to work towards commonly agreed Principles and Guidelines on Access to Research Data from Public Funding.
- Greater international co-operation in science and technology is vital to meet a broad range of global challenges related to economic growth, better health, sustainable development, and enhanced safety and security, as well as for implementing large science projects in a growing range of disciplines. In this regard, Ministers adopted a Declaration aiming at strengthening international S&T co-operation for sustainable development. They endorsed efforts to establish a framework for a Global Biological Resource Centre Network and gave their support to promote scientific co-operation in the fields of high-energy physics and neuroinformatics.

**Connecting science to innovation**

6. As distinctions between fundamental and problem-oriented research have blurred, and demands to make public research more responsive to the needs of business and civil society have mounted, there is a greater need for increased and more efficient linkages between science and innovation. Such linkages serve to both facilitate industry's uptake and commercialisation of public-sector research results and to ensure that research performed in the public sector is attuned to social and economic problems. Science-innovation linkages can take many forms, from contract and collaborative research and personnel transfers to technology licences and creation of spin-off firms. In this regard, Ministers welcomed the conclusions of recent OECD reports on *Governance of Public Research, Benchmarking Industry-Science Relationships, and Turning Science into Business*. They stressed the importance of ensuring efficient and transparent mechanisms for steering and funding public research institutions, of increasing use of public-private partnerships to promote science-based innovation, of improving mobility of research personnel, and of creating a business environment in which both established and start-

up firms demand new scientific and technological advances.

7. Ministers shared the view that, in funding R&D activities or incentive programmes, fundamental, long-term research should remain a priority. This will help ensure that universities and public laboratories can continue to explore knowledge frontiers on a broad front, remain reliable sources of objective scientific expertise and perform their critical role in training future researchers and skilled workers. Ministers agreed that government incentives for business R&D must evolve to better account for greater outsourcing of R&D among firms, the growing funding opportunities offered by modern financial markets and the role of non-profit organisations in financing research.

8. Ministers recognised the need to improve the quality of research and enhance its economic and social benefits while ensuring a degree of stability and autonomy for public research institutions. They agreed that the balance between competitively awarded project funding and institutional block grants might need to be reconsidered. They also agreed that wide access to knowledge from publicly funded research should be ensured and that ethical guidelines are necessary to prevent or resolve conflicts of interest among researchers involved in collaboration with industry.

9. Growing emphasis on industry-science linkages has resulted in new types of programmes and created new objectives for existing ones. Ways of evaluating the performance of public research organisations and the efficiency of public support to business R&D must therefore be revised. Ministers highlighted the importance of evaluation and noted a need for good practices regarding methodologies and institutional mechanisms for evaluation that reflect changing policy priorities and instruments.

**Adapting IPR regimes**

10. Patenting has accelerated rapidly in the past decade, with the number of patent applications filed in Europe, Japan and the United States increasing by 40% between 1992 and 2002, from 600 000 to 850 000 per year. The effects of such patenting on incentives to innovate, on the diffusion of scientific and technical knowledge and on competition remain unclear and vary across industry sectors and technological fields. In this regard, Ministers welcomed the OECD report on "Patents and Innovation: Trends and Policy Challenges", and encouraged continuation of OECD work in this area.

11. Although not widespread, cases of restricted access to patented inventions and delays in conducting or publishing research, indicate that governments must remain vigilant in ensuring that patenting does not unnecessarily hinder access to knowledge, reduce incentives to disseminate knowledge, or impede follow-on innovation. Ministers recognised the growing importance of patent licences and other market-based transactions in fostering knowledge diffusion and agreed that policy should encourage their development. Ministers further shared the view that IPR regimes need to protect researchers' access to fundamental inventions, such as through exemptions for research use of patented inventions.

12. The more important patents become to economic growth and performance, the more necessary it will be to ensure the quality of patents awarded while minimising their overall costs to society. Ministers welcomed the steps that a number of countries have already taken in that direction, and agreed that good practices in this area should be emulated. In this context, they encouraged the development of efforts to forge closer co-operation among major patent offices

towards a more coherent global patent system.

**Building a highly skilled and mobile scientific workforce for the future**

13. Against the background of growing demand for human resources in science and technology, Ministers expressed concern that the recent decline in the number of science and engineering graduates could hamper the long-term growth prospects of OECD countries. The challenge of meeting demand for S&T talent is made all the more difficult by waning interest in science among youth, the gender gap among S&T graduates (notably at the doctorate level), the rapid ageing of the workforce in the public research sector, regulatory barriers and market disincentives to research careers, and the globalisation of higher education and research systems.

14. Ministers called for greater efforts to ensure an adequate supply of scientific and technological skills by: strengthening policies to enhance awareness and public understanding of science, especially among youth; improving the quality of scientific teaching and encouraging individual creativity; expanding the participation of women and under-represented groups; and broadening opportunities and support for students to pursue S&T studies. In this respect, Ministers recognised that tertiary education institutions should have the necessary autonomy and incentives to adapt curricula to changing skill demands, including for interdisciplinary knowledge and managerial/entrepreneurial skills, and to develop partnerships with industry to meet these goals.

15. Ministers further emphasised the need to pursue reforms in the human resource management policies of public research organisations to improve their responsiveness to changes in research priorities and funding, to help renew the research workforce, and to encourage mobility between the public and private research sectors. They further stressed the need for removing obstacles on the demand side that limit the contribution of S&T personnel to innovation in industry, in particular in SMEs. Incentives for business R&D in small firms and educational training partnerships are among the measures that can stimulate business demand for S&T graduates and enhance their capacity to innovate, as well as provide young graduates with the right skills to work as researchers in industry.

**International co-operation in science and technology**

16. Increased international co-operation in science and technology is important for meeting a broad range of global challenges, for benefiting from globalisation and for implementing large-scale research projects. Ministers commended OECD activities in this area and asked the OECD to continue this work. Ministers then examined a number of international S&T issues.

***Access to research data***

17. Ministers recognised that fostering broader, open access to and wide use of research data will enhance the quality and productivity of science systems worldwide. They therefore adopted a Declaration on Access to Research Data from Public Funding, asking the OECD to take further steps towards proposing Principles and Guidelines on Access to Research Data from Public Funding, taking into account possible restrictions related to security, property rights and privacy (Annex 1).

***Sustainable development***

18. Beyond the role they recognised for biotechnology in meeting sustainability objectives, Ministers stressed the importance of international co-operation in science and technology to sustainable development, notably by transferring knowledge and technology among member countries and to less-developed ones. They reaffirmed their commitment to achieving the objectives adopted by the World Summit on Sustainable Development, held in Johannesburg on 4 September 2002, and welcomed the conclusions of the 2003 G8 Summit in Evian regarding Science and Technology for Sustainable Development. Ministers endorsed the Declaration on International Science and Technology Co-operation for Sustainable Development (Annex 2).

***Biotechnology***

19. Ministers agreed that biotechnology is a significant driver of sustainable growth and development and that a solid infrastructure is required to assure such growth. Ministers therefore agreed to endorse efforts to establish a framework for a Global Biological Resource Centre Network (GBRCN) by 2006. They endorsed OECD papers setting out guidance for certification and quality criteria for biological resource centres and for the operation of biological resource centres. Ministers called on the OECD to strengthen its contribution to work on biotechnology, focusing on enabling innovation in health biotechnology and on the contribution that industrial biotechnology can make to a more bio-based economy. In that context, they endorsed the OECD report Biotechnology for Sustainable Growth and Development and its conclusions, which Ministers agreed should be brought to the attention of those ministers reviewing the OECD health project in May 2004.

***Global Science Forum***

20. Ministers welcomed the achievements of the OECD Global Science Forum, whose creation they endorsed at their previous meeting in 1999. The Forum has been a useful venue for consultations among senior science policy officials and programme managers, and a valuable mechanism for bringing together government officials with representatives of scientific communities. Ministers devoted particular attention to two outcomes of the Forum's work, as described below. Noting the positive results of the evaluation exercise that took place at the end of 2003, Ministers supported the renewal of the Global Science Forum's mandate, urging it to explore new opportunities for actions in areas of great scientific and social relevance.

*High-energy physics*

21. Ministers acknowledged the importance of ensuring access to large-scale research infrastructure and the importance of the long-term vitality of high-energy physics. They noted the worldwide consensus of the scientific community, which has chosen an electron-positron linear collider as the next accelerator-based facility to complement and expand on the discoveries that are likely to emerge from the Large Hadron Collider currently being built at CERN. They agreed that the planning and implementation of such a large, multi-year project should be carried out on a global basis, and should involve consultations among not just scientists, but also representatives of science funding agencies from interested countries. Accordingly, Ministers endorsed the statement prepared by the OECD Global Science Forum Consultative Group on High-Energy Physics (Annex 3).

*Neuroinformatics*

22. Ministers agreed that the study of the human brain will be one of the most difficult and rewarding scientific challenges of the 21st century. They noted that brain research generates vast quantities of highly diverse data, and that the international scientific community is facing the challenge of managing, analysing and sharing these data in a way that optimises the scientific benefits, avoids duplication of effort, and takes maximum advantage of the ongoing revolution in information and communication technologies. They welcomed the emergence of the new field of neuroinformatics, which has been the subject of an international consultation among scientists and science policy makers under the aegis of the OECD Global Science Forum. They agreed that interested countries should join together to create optimal conditions for the expansion and international co-ordination of this new field, as described in the annexed document (Annex 4).

***Enhanced safety and security***

23. At their working lunch Ministers discussed how science and technology could contribute to improving safety and security, including areas such as cybersecurity, transport security, environment security, crisis management and infectious disease prevention. Addressing those safety and security issues will require a global approach involving multiple stakeholders. Among the many issues addressed was the role of biometrics in achieving safety and security goals. Implementation of biometrics will require significant research and development. Issues of personal privacy and data protection will also need to be addressed. Ministers agreed that generating new biometrics devices would present significant challenges over the next decade.

***Service economy***

24. Ministers welcomed the launching of the work on the service economy which had been proposed at the 2003 Council Meeting at Ministerial level (MCM). This study will analyse the role of science, technology and innovation in the service sector for enhancing overall economic performance.

**Areas for further OECD work**

25. Building on the valuable work of the CSTP and its subsidiary bodies - Working Party on Innovation and Technology Policy, Working Party of National Experts on S&T Indicators, Working Party on Biotechnology, Global Science Forum, ad hoc Group on Steering and Funding of Research Institutions - Ministers invited the OECD to further develop its activities in the following areas, subject to the availability of resources:

*Science-innovation interface*

- *Strengthening the evaluation of public research organisations, support programmes, and overall science and technology policy:* Identifying and sharing good practice approaches to the development of improved methodologies for the assessment of economic and societal impacts.
- *Furthering the analysis of science systems and industry-science relationships:* Assessing the impact of changing funding mechanisms on the management and performance of research institutions, and the role of public-private partnerships in increasing the effectiveness of science and technology policy.
- *Examining the role of IPR systems in fostering innovation, knowledge diffusion and*

*competition*: Investigating the ability of technology markets to disseminate patented inventions and identifying effective policy measures for promoting them, notably as regards SMEs; Examining national policies regarding exemptions for research use of patented inventions and assessing their effect on the conduct of scientific research; Reviewing the effect of various forms of intellectual property protection for software on access to software-related knowledge and follow-on innovation; Developing good licensing practices for biotechnology patents.

- *Identifying* best practices in S&T policies to respond to the challenges and opportunities of increased globalisation.

*Human resources in science and technology*

- *Fostering a diverse and mobile workforce for science and technology:* Assessing trends in supply and demand for science and technology graduates, including PhDs, and identifying successful policy measures for increasing participation, in particular of women, in scientific and technological education and careers; Analysing recent changes in the international mobility of students and personnel in science and technology fields, and their implications for policy.
- *Improving data on the development and mobility of human resources in science and technology:* Using existing data sources and developing new statistical approaches, especially on mobility; Collecting and exchanging information on the career paths of holders of doctorates.
- *Reinforcing* the capability, including the use of OECD's interdisciplinary strength, to make science and technology more appealing and attractive from the early stages of education.

*Biotechnology*

- *Strengthening its contribution to work on biotechnology* as a driver for sustainable growth, focusing on establishing a framework for a Global Biological Resource Centre Network, on enabling innovation in health biotechnology and on contributions from industrial biotechnology to a more bio-based economy.

*International co-operation in science and technology*

- *Strengthening* the role of international collaboration in S&T for sustainable development, growth and prosperity through continued discussion of high-priority science and technology policy issues that require international co-operation.
- *Following up* on the recommendations for future work as indicated in the annexes to this document.
- *Further analysing* the role that S&T can play in the enhancement of safety and security.

---

**ANNEX 1**

# DECLARATION ON ACCESS TO RESEARCH DATA FROM PUBLIC FUNDING

**adopted on 30 January 2004 in Paris**

**The governments (1) of Australia, Austria, Belgium, Canada, China, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Russian Federation, the Slovak Republic, the Republic of South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States**

Recognising that an optimum international exchange of data, information and knowledge contributes decisively to the advancement of scientific research and innovation;

Recognising that open access to, and unrestricted use of, data promotes scientific progress and facilitates the training of researchers;

Recognising that open access will maximise the value derived from public investments in data collection efforts;

Recognising that the substantial increase in computing capacity enables vast quantities of digital research data from public funding to be put to use for multiple research purposes by many research institutes of the global science system, thereby substantially increasing the scope and scale of research;

Recognising the substantial benefits that science, the economy and society at large could gain from the opportunities that expanded use of digital data resources have to offer, and recognising the risk that undue restrictions on access to and use of research data from public funding could diminish the quality and efficiency of scientific research and innovation;

Recognising that optimum availability of research data from public funding for developing countries will enhance their participation in the global science system, thereby contributing to their social and economic development;

Recognising that the disclosure of research data from public funding may be constrained by domestic law on national security, the protection of privacy of citizens and the protection of intellectual property rights and trade secrets that may require additional safeguards;

Recognising that on some of the aspects of the accessibility of research data from public funding, additional measures have been taken or will be introduced in OECD countries and that disparities in national regulations could hamper the optimum use of publicly funded data on the national and international scales;

Considering the beneficial impact of the establishment of OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data (1980, 1985 and 1998) and the OECD Guidelines for the Security of Information Systems and Networks (1992, 1997 and 2002) on international policies for access to digital data;

***DECLARE THEIR COMMITMENT TO:***

Work towards the establishment of access regimes for digital research data from public funding in accordance with the following objectives and principles:

**Openness:** balancing the interests of open access to data to increase the quality and efficiency of research and innovation with the need for restriction of access in some instances to protect social, scientific and economic interests.

**Transparency:** making information on data-producing organisations, documentation on the data they produce and specifications of conditions attached to the use of these data, available and accessible internationally.

**Legal conformity**: paying due attention, in the design of access regimes for digital research data, to national legal requirements concerning national security, privacy and trade secrets.

**Formal responsibility**: promoting explicit, formal institutional rules on the responsibilities of the various parties involved in data-related activities pertaining to authorship, producer credits, ownership, usage restrictions, financial arrangements, ethical rules, licensing terms, and liability.

**Professionalism:** building institutional rules for the management of digital research data based on the relevant professional standards and values embodied in the codes of conduct of the scientific communities involved.

**Protection of intellectual property**: describing ways to obtain open access under the different legal regimes of copyright or other intellectual property law applicable to databases as well as trade secrets.

**Interoperability:** paying due attention to the relevant international standard requirements for use in multiple ways, in co-operation with other international organisations.

**Quality and security**: describing good practices for methods, techniques and instruments employed in the collection, dissemination and accessible archiving of data to enable quality control by peer review and other means of safeguarding authenticity, originality, integrity, security and establishing liability.

**Efficiency:** promoting further cost effectiveness within the global science system by describing good practices in data management and specialised support services.

**Accountability:** evaluating the performance of data access regimes to maximise the support for open access among the scientific community and society at large.

Seek transparency in regulations and policies related to information, computer and communications services affecting international flows of data for research, and reducing unnecessary barriers to the international exchange of these data;

Take the necessary steps to strengthen existing instruments and - where appropriate - create within the framework of international and national law, new mechanisms and practices supporting international collaboration in access to digital research data;

Support OECD initiatives to promote the development and harmonisation of approaches by

governments adhering to this Declaration aimed at maximising the accessibility of digital research data;

Consider the possible implications for other countries, including developing countries and economies in transition, when dealing with issues of access to digital research data.

***INVITE THE OECD:***

To develop a set of OECD guidelines based on commonly agreed principles to facilitate optimal cost-effective access to digital research data from public funding, to be endorsed by the OECD Council at a later stage.

_____

(1) Including the European Community

___

## ANNEX 2
## DECLARATION ON INTERNATIONAL SCIENCE AND TECHNOLOGY CO-OPERATION FOR SUSTAINABLE DEVELOPMENT

**adopted on 30 January 2004 in Paris**

**The governments (1) of Australia, Austria, Belgium, Canada, China, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Russian Federation, the Slovak Republic, the Republic of South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States**

Recognising that sustainable development involves human progress towards a more prosperous and equitable future within the context of environmental conservation and even development with respect to access to resources, energy, markets, health and education;

Recognising that sustainable development brings into sharper focus the growing socio-economic interdependence of developed countries with developing countries and economies in transition;

Recognising that the process of globalisation has given rise to new patterns of networking that are changing the way in which knowledge is created, diffused and applied, and that comprehensive responses, especially innovative policies and technologies, are required to bridge global inequalities including in knowledge and information;

Recognising that global science and technology networks and platforms bringing together relevant social and professional communities facilitate the expansion of concerted international collaboration to more effectively address the challenges of sustainable development;

Recognising that in order to optimise the contributions of science and technology to sustainable development, it is necessary to enhance the use of existing national and international instruments and facilitating mechanisms, and promote mutually beneficial collaboration between governments, civil society, business and industry;

Recognising that in order to increase confidence in the application of science and technology for sustainable development, citizens need reassurances about effective risk management, appropriate regulatory environments and observance of ethical considerations by science and technology practitioners;

Recognising the importance of international scientific and technological co-operation as a means for human resource development and institutional capacity building to strengthen problem-solving competencies in developing countries and economies in transition;

Recognising the competence of the OECD Committee for Scientific and Technological Policy in facilitating international scientific and technological co-operation and enhancing exchange of information on science and technology policy practices, and the distinctive role played by the Global Science Forum in addressing complex scientific issues as well as, more generally, the major contribution that the OECD is making in addressing sustainable development issues, and the scope that exists for providing developing countries and economies in transition with best practice frameworks in the development and implementation of science and technology policies for sustainable development;

**REAFFIRM** the objectives set forth in the Johannesburg Declaration on Sustainable Development, as adopted by the World Summit on Sustainable Development (WSSD) on 4 September 2002; and the concrete actions and measures set out in the Plan of Implementation of the WSSD emphasising the critical role of science and technology as key instruments to address the challenges in sustainable development, including the specific areas of water, energy, health, agriculture and biodiversity.

**DECLARE THAT:**

They reaffirm their commitment expressed at the WSSD to the promotion of sustainable development through the application of science and technology by strengthening national innovation policies and programmes, and by enhancing existing global collaborative networks.

They will take the necessary steps, within the framework of international agreements as well as their respective laws and practices, to strengthen existing national and regional research and development funding programmes and instruments to support international collaboration in science and technology for sustainable development, in particular in respect of:

a) Citizen education and public awareness regarding safety and ethical concerns relating to the application and the utility of science and technology for sustainable development.

b) Strengthening innovation and knowledge-generation capacities of developing countries and economies in transition to entrench science and technology for sustainable development.

They will support initiatives undertaken by the CSTP, its subsidiary bodies and more generally the OECD, notably those of the International Energy Agency (IEA), to promote international science and technology collaboration for sustainable development. These initiatives will form

part of a plan of activities to be mapped and monitored. Some of these activities may include:

a) Supporting the exchange of information about effective methods to promote sustainable development through science and technology, with the aim of achieving the objectives of this Declaration.
b) Introducing initiatives that are complementary to but do not duplicate WSSD follow-up activities, which promote research for sustainable development and support dedicated research partnership initiatives including developing countries and economies in transition. Such initiatives may include:

i) The development of new or enhanced international research co-operation initiatives that address the scientific dimensions of issues of global concern in the area of sustainable development on the basis of an evaluation of current international co-operation programmes.
ii) The identification of new science and technology policy choices for sustainable development as well as benchmarking good practice activities in support of the creation of framework conditions for developing countries and economies in transition.
iii) Supporting activities on the development of a bio-based economy, the possible establishment of a framework for a network of Biological Resource Centres and the role of biotechnology in fighting infectious diseases, especially emerging, neglected diseases.

c) Fostering a dialogue within all relevant fora of the OECD, including the IEA, on the critical interface between science and technology and sustainable development, and the necessity for a broad collaborative effort, including with non-member economies.

They agree to review progress made in furtherance of the objectives of this Declaration within a period of three years, and to examine the need for new strategic options to ensure the most effective harnessing of science and technology for sustainable development in the appropriate OECD fora.

**FURTHER DECLARE THAT THE OECD SHOULD:**

Further articulate specific issues raised within the Plan of Implementation of the WSSD and by relevant OECD and CSTP policy recommendations on science and technology for sustainable development, such as the outcome of the OECD Seoul Conference on International Science and Technology Co-operation: Towards Sustainable Development, held in November 2000 and, after collection and distribution of case studies of member countries and CSTP observers, provide practical assistance and advice to them on the formulation and implementation of policies which would harness science and technology as instruments for sustainable development.

Co-operate with relevant regional and international organisations as well as civil society, industry and business, as they work to promote sustainable development through science and technology.

Periodically review the main developments and issues in the fields of sustainable development and science and technology with respect to the objectives of this Declaration.

**INVITE:**

Other countries to take this Declaration into account.

Relevant international organisations to take this Declaration into consideration as they develop or revise international instruments to harness the contributions of science and technology to sustainable development.

Industry, business and civil society to take the objectives of this Declaration into account and to work with governments to further them by implementing programmes for optimising the contribution of science and technology to sustainable development.

Concerned countries and relevant stakeholders to convene, in collaboration with the OECD if possible, an appropriate event such as a dedicated conference of specialists on the issues raised by this Declaration to further enhance the consensus of the WSSD on the application of science and technology for sustainable development.

_____

(1) Including the European Community

___

## ANNEX 3
## International Co-operation on Large Accelerator-based Projects in High-energy Physics

Ministers expressed their appreciation for the work of the OECD Global Science Forum Consultative Group on High-Energy Physics. They welcomed the report from the Group and commended the clarity and worldwide consensus they found among the high-energy physics community in developing the roadmap for future large accelerator-based facilities.

In particular, the Ministers noted several important points that were articulated in the report:

- A roadmap that identifies four interdependent priorities for global high-energy physics (HEP) facilities: i) the exploitation of current frontier facilities until contribution of these machines is surpassed; ii) completion and full exploitation of the Large Hadron Collider at CERN; iii) preparing for the development of a next-generation electron-positron collider; and iv) the continued support for appropriate R&D into novel accelerator designs.
- The need to have large, next-generation facilities funded, designed, built, and operated as global-scale collaborations with contribution from all countries that wish to participate.
- The need for strong international R&D collaboration and studies of the organisational, legal, financial, and administrative issues required to realise the next major accelerator facility on the Consultative Group's roadmap, a next-generation electron-positron collider with a significant period of concurrent running with the LHC.
- The need to continue to educate, attract and train young people in the fields of high-energy physics, astrophysics and cosmology in the face of the increasingly competitive environment where all areas of science, industry and commerce are seeking to capture the imagination of the most creative minds.

- Ministers agreed that, given the complexity and long lead times for decision making of major international projects, it is important that consultations continue within the scientific communities and, when it becomes appropriate, within interested governmental communities in order to maximise the advantages offered by global collaboration.

___

## ANNEX 4
## International Co-operation in Neuroinformatics

Ministers expressed their appreciation for the work of the OECD Global Science Forum Neuroinformatics Working Group. They commended the Working Group on their June 2002 report and on the development of three action recommendations. They agreed that the study of the human brain is one of the most important and difficult scientific challenges of the 21st century. Advances in the understanding of the brain will lead to breakthroughs in the prevention and cure of devastating diseases, and to improvements in the quality of life for millions of people. They will also provide substantial economical gains for society in terms of improved health, and new developments in pharmaceutical approaches and information technologies.

Neuroscientists have developed sophisticated methods to investigate the brain in very fine detail. Their measurements and computations produce enormous amounts of data whose extraordinary complexity and diversity reflect that of the brain itself. The challenge of managing these vast amounts of data is now being addressed via the new field of neuroinformatics that has emerged at the interface between neuroscience and information science.

The Neuroinformatics Working Group recommends that the management and exploitation of data about the brain can be best achieved through a co-ordinated, multidisciplinary, international effort. It has recommended the establishment of a new global mechanism, the "International Neuroinformatics Coordinating Facility" (INCF), creation of an associated funding scheme, the "Programme in International Neuroinformatics", and the establishment of national nodes and research programmes in neuroinformatics. The goal of the INCF would be the construction, maintenance, standardisation, sharing and updating of neuroinformatics databases systems and modelling tools via the co-ordination and synchronisation of national nodes. In addition, the INCF would promote research projects in neuroinformatics through a new international funding scheme.

The establishment of the International Neuroinformatics Coordinating Facility requires international consultations among interested governments. Ministers endorsed these efforts and expressed hopes for their successful conclusion, taking into account the needs, requirements and procedures of participating countries.