

# RESEARCH AND DEVELOPMENT IN HUNGARY 2003–2004

Realising that the modern economies in the 21<sup>st</sup> century will be based on knowledge, Hungary took internationally recognised steps in the foundation of knowledge-based economy. The present document is aimed at providing concise information for interested parties on the Hungarian national innovation system, the performance of this system, the main features of the science and technology policy, and finally present possibilities for international co-operation in science and technology.

2003 has been an important reform year in the field of science and technology in Hungary and the reforms will be completed in 2004. These changes are in line with the increasing recognition that a proactive competitiveness policy is necessary. The timing of the EU membership of Hungary and the reform of the Hungarian RTD system seem to be synchronised.

## 1. Main components of the Hungarian national science and technology system

The present Hungarian national innovation system at institutional level consists of three main components such as the governmental organisations, the Hungarian Academy of Sciences and the research and technology institutions.

### 1.1. National system of governance of innovation policy (Political level, Government level)

The recent institutional reforms in this respect are the following:

a) The establishment of the Science and Technology Policy College (TTPK) and its advisory body composed of eleven highly distinguished representatives of the national scientific community and industry (Science and Technology Advisory Committee, TTTT) in April 2003. TTPK is the highest government level consulting body of science and technology policy.

b) From 2000 to 2003, on the Government level, the Ministry of Education (MoE) has been responsible for planning and implementing the Hungarian science and technology policy, for the competition based research and development programmes and for promoting the international science and technology co-operation of Hungary, including EU-related research matters. On 1st January 2004 a new government office, the National Office of Research and Technology (NKTH) has been set up as a legal successor of R&D Division of the MoE.

The NKTH has the following responsibilities and missions:

- elaborating the government strategy in the field of innovation,
- forming the means and tools for the R&D and innovation policy at government level,
- prepares documents concerning the national science and technology policy, runs technology foresight programmes, prepares reports and reviews for promoting the acquisition and dissemination of new knowledge and information serving the government's science and technology strategy in co-operation with social partners, NGOs, industrial and professional associations,
- represents the government in the international field, in intergovernmental S&T organisations and programmes, organises and co-ordinates the Hungarian participation in such programmes. In this capacity, it is also in charge of the multilateral S&T co-operation and participates in the EU accession process,

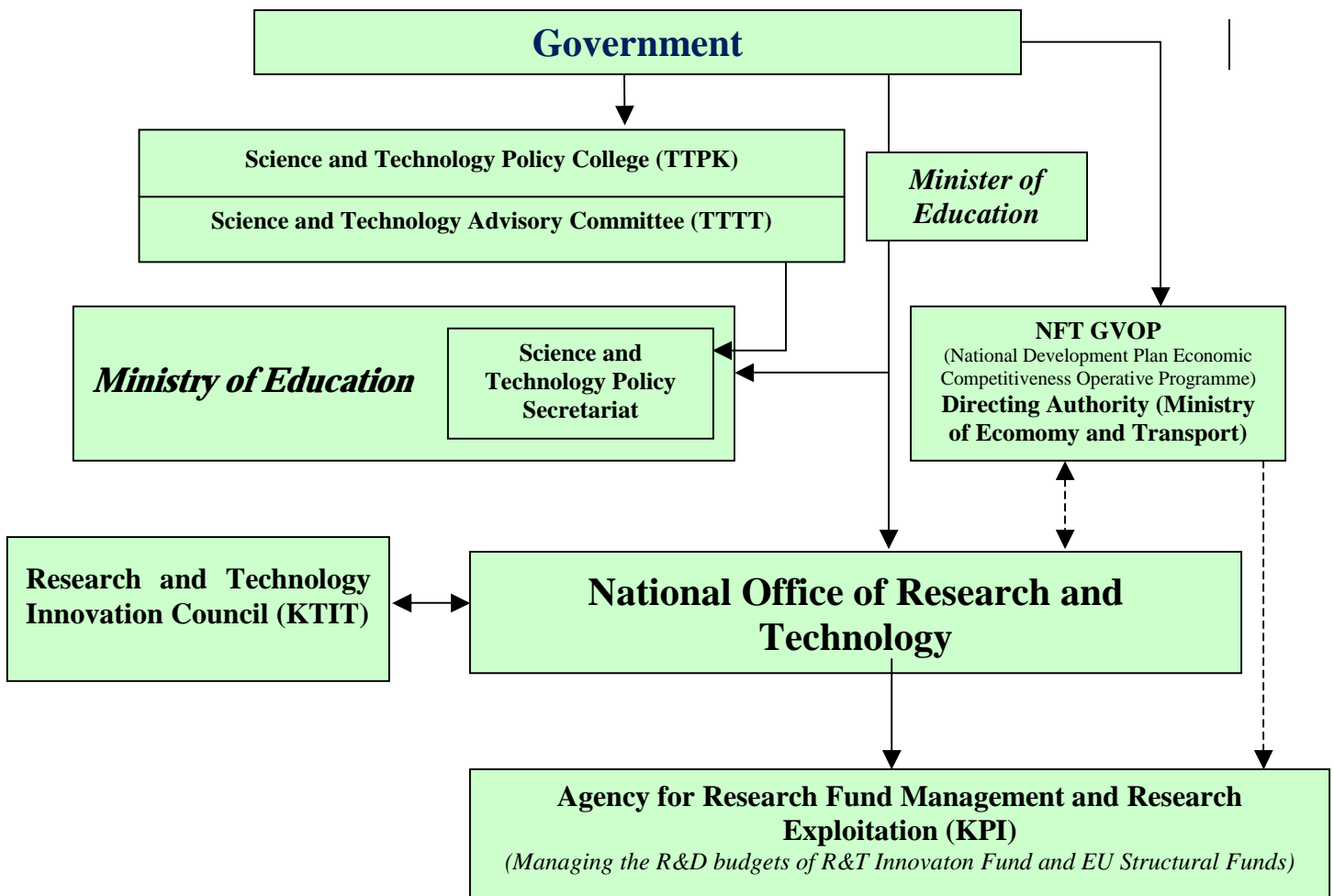
- co-ordinates the activity of the Research and Technology Innovation Fund, involving the former National Technology Development Fund (KMÜFA) and the National R&D Programmes, and to supervise the Agency for Research Fund Management and Research Exploitation that was set up in August 2003. This Agency is responsible for managing different R&D support programmes financed from the Research and Technology Innovation Fund.
- raising innovation awareness in the society.

c) From August 1, 2003 a new agency has been set up.

The main tasks of the Agency for Research Fund Management and Research Exploitation (KPI) are:

- Financing R&D and innovation projects through open calls using the sources of the Research and Technology Innovation Fund,
- Accredited implementing organisation (intermediary body) of the Research, Development and Innovation priority within the Economic Competitiveness Operational Programme (see 2.2), using the EU Structural Funds and national co-financing,
- Promoting public-private partnerships,
- Advisory services for S&T stakeholders at national and regional level.

*Fig. 1. The new governmental R&D institutions*



## 1.2. The Hungarian Academy of Sciences (HAS)

In accordance with Law XL of 1994, the Hungarian Academy of Sciences (HAS) is an autonomous public body based on the principle of self-governance. It is constituted by the members of the Academy - ordinary and corresponding as well as external and honorary members - and by those active representatives of science who hold a scientific degree (Ph.D. or D.Sc.). At present the number of the ordinary members is 214, while the number of the corresponding members is 86. Ordinary and corresponding members elect academicians. The number of public body-members at present - with academicians - is 7030. They - other than academicians - exercise their rights through representation, electing 200 non-academician representatives to the General Assembly, the main organ of the Academy, for a three period.

It is the right and duty of the Academy to

- support the development of sciences, scientific research, and the publication of scientific books and journals;
- regularly evaluate scientific research results as well as encourage and assist publication, dissemination and utilisation of them;
- represent, within its sphere of responsibilities, Hungarian science in Hungarian public life and at international scientific fora.

To perform these tasks the Academy

- establishes and maintains research institutes for nurturing scientific research, and runs other institutions: libraries, archives, information systems etc. (at present the number of the research institutes belonging to the Academy is 37, the number of - mainly university-affiliated - research groups, not belonging to but supported by the Academy is 125);
- sets up scientific sections and committees to co-ordinate the activity of researchers working at different institutions, research units and universities (at present the number of scientific sections is 11, the number of scientific committees is 128);

The Academy's share in the Hungarian research capacity in terms of the total number of other Hungarian R&D organisations is about 10%, within this that of R&D institutions is slightly more than 60%. The Academy's share in the number of total R&D personnel is almost 20%. According to the different fields of sciences, this share is the highest in natural sciences (based on the share in R&D expenditures of all R&D units, it is almost 60%), and by phases of research its share is decisive in the field of basic research (also based on the share in R&D expenditures of all R&D units, it is more than 40%).

### 1.3. Research and technology institutions in Hungary

Table 1. Number of R&D units

Year	R&D institutes and other research institute	R&D units of higher education	R&D units of enterprises	Total
1992	118	1 071	98	1 287
1993	124	1 078	178	1 380
1994	112	1 106	183	1 401
1995	107	1 109	226	1 442
1996	121	1 120	220	1 461
1997	131	1 302	246	1 679
1998	132	1 335	258	1 725
1999	130	1 363	394	1 887
2000	121	1 421	478	2 020
2001	133	1 574	630	2337
2002	143	1 613	670	2426

Source: Central Statistics Office (CSO)

In the **higher education sector** the overwhelming proportion of the research units is part of the higher education (1613 units). The R&D budgets of universities are largely dependent on governmental subsidies. There are two main types of subsidies: the normative research support and the various governmental funds and programmes. Besides, the co-operation between universities and private sectors and the participation in multilateral and bilateral scientific programmes are the main income sources of the universities. Although the sources of higher education increased largely in the past few years, the research expenditure of that did not grow significantly. Nevertheless, the R&D sources of the universities started to accelerate in 2002; for example, the budget of the Higher Education Research Fund increased approx. threefold [from 884 million HUF to 2,3 billion HUF (1 EUR~254 HUF)]. The 37 research institutes of the HAS are dealing with natural sciences and mathematics, life sciences and social sciences including humanities. Several HAS research groups working at universities continue their activities in favourable atmosphere at the new integrated universities.

#### **Non-budgetary research establishments:**

The Bay Zoltán Foundation (BZF) and the Collegium Budapest are the most important among the research units of foundations and associations. The BZF is the largest research foundation in Hungary, founded in 1993, comprising three research units: Institute for Biotechnology, Institute for Material Science and Technology and Institute of Logistics and Production Engineering. Following the model of the pioneering Princeton Institute for Advanced Studies and Wissenschaftskolleg Berlin the Collegium Budapest (CB) is the first IAS-type institute in Central and Eastern Europe. As an adaptation of the Princeton model, the CB represents a new type of institute, different from both universities and specialised

research institutes. Its main attraction is offering its research fellows temporary liberation from their administrative and teaching obligations, allowing them to concentrate fully on their chosen research agenda.

It is important to mention that five research institutes belonging to the HAS as well as the CB were successfully applying for a three-year grant from the European Commission in the programme supporting 'Centres of Excellence' in the region. More than 180 institutes from CEE countries applied, the CB was ranked on the third place.

### **Research and development in the business sector:**

The innovation activity of the business sector is growing in importance, which is reflected in the increasing number of R&D units at enterprises. A number of well-known trans-national companies have set up research laboratories in the country.

The main R&D facilities in Hungary were established or maintained by multinational companies are:

- Lighting technique (GE-TUNGSRAM)
- Medical equipment (GE-Medicor)
- Pharmaceuticals (Sanofi-Chinoin, Astra, Teva-Biogal, Akzo Nobel/Organon)
- Information and telecommunication (Ericsson, IBM, Compaq, Nokia, Siemens, Motorola, Tata Consultancy, T-Systems/Matáv)
- Machinery (Audi, Volkswagen, TEMIC, Michelin, Knorr-Bremse, Mannesmann-Rexroth, Flextronics)
- Agrifood (Novartis/Sandoz Seeds)
- Household chemicals (Unilever)
- New materials (ZOLTEK, Furukawa)

## **2. Science and technology policy**

### **2.1. Science and technology policy framework**

Science and technology policy is defined in the 2002 government programme as an increasingly important government tool to promote the development of the society and economy. The further continuous growth of the R&D expenditures will be provided by direct budget allocations and indirect economy and science policy incentives.

Policy targeting the production related innovation has a priority in the government programme. Investments based on advanced technology, highly skilled workforce and co-operation with local development initiatives also have preference. The government defines four priority areas:

- innovation conducive legal framework,
- making Hungary attractive as an R&D site,
- enhancing the protection of intellectual property,
- increasing the sources for innovation is SMEs.

The regional co-ordination of innovation has to be strengthened to provide all regions with significantly more domestic and international sources for science and technology.

The Government Programme declares that both the state and the business community have to fulfil their role in ensuring that research, development and industry are brought closer to each other and placed in the service of the country's economic advancement. To achieve this, the country needs co-ordinated education, research, development and innovation policies, as well as measures to stimulate the research and development activities of the

private sector. The national programmes formulated in this spirit include the main directions of development, taking into account the economic, social and political changes in the world as well as Hungary's national characteristics.

## 2.2. The National Development Plan

After joining the European Union on 1st May 2004, Hungary will be eligible for its major support schemes, the Structural Funds and the Cohesion Fund. In order to qualify for these resources, Hungary prepared and submitted in 2003 the **National Development Plan (NFT)** for the applicable part (2004-2006) of the 2000-2006 European planning period. The focus of the Hungarian NFT is on convergence with the level of socio-economic development of the EU, which is in line with the primary aim of Structural Funds, namely, strengthening the economic and social cohesion, reduce the development differences between member states and regions. The continuous convergence is ensured by the main specific objectives of the NFT:

- creating a more competitive economy,
- improving the use of human resources,
- ensuring better environment and basic infrastructure,
- a more balanced regional development.

Five Operative Programmes serve to fulfil these objectives. One of them is the Economic Competitiveness Operative Programme (GVOP), focusing on R&D and innovation along with further important topics like information society, investment incentives and SME promotion. The aim of the GVOP is to broaden and expand the basis of economic development, according to branches, sectors and regions, and to maintain the high rate of growth, which is currently higher than the EU average, through boosting productivity and the rate of employment, which ensures a gradual convergence between the economic development of the country and the EU. So as to address the above strategic directions, five priorities (sub-programmes) were specified in the GVOP:

- investment promotion,
- development of SMEs,
- R&D, innovation,
- development of the information society and e-economy,
- technical assistance.

All existing and planned R&D and innovation actions are organised in three measures:

### 1) Support of application-oriented co-operative research and technology development activities

The objective of the measure is to support, in order to enhance the competitiveness of Hungarian economy, technology development based on applied (industrial) and pre-competitive (experimental) research and to develop and test new products, instruments, procedures and services, focusing on areas of most dynamic development such as biotechnology, environmental protection, materials technologies and information technologies and applications. Another objective is to strengthen co-operation between publicly financed research facilities and the corporate sector.

### 2) Improvement of the conditions of research, technology transfer and co-operation at publicly financed and non-profit research facilities

The purpose of the measure is the indirect improvement of the competitiveness of domestic R&D activity

- by increasing the efficiency of the R&D activity in publicly financed and non-profit research facilities, and by improving their instrumentation and developing their research infrastructure;
- reinforcement of the scientific and technological co-operation of the business sector and the publicly financed research facilities, the integration of education, economic and social target-oriented research & development and knowledge and technological co-operation for strategic purposes in Co-operative Research Centres.

### 3) Reinforcement of corporate R&D capacities and innovation skills

The measure targets the improvement of competitiveness of the corporate sector through developing of their R&D potential and capability and innovative, technology-intensive activities by:

- raising the quality of corporate research work, supporting high value-added activities;
- broadening the fields of corporate R&D activity and strengthening the adaptation and utilisation of R&D results at companies;
- promoting innovative new enterprises and technology-intensive SMEs;
- and improving the quality of corporate research infrastructure.

### 2.3. Legal reform in S&T

In order to strengthen the legal framework of S&T, two bills have been recently prepared:

The "**Act XC year 2003 on the Research and Technology Innovation Fund**" was approved by the Hungarian Parliament on November 10, 2003, providing stable and reliable financing for competitiveness oriented research, development and innovation activities. A calculable central fund is necessary to promote the R&D and the research utilization activities, the development of R&D infrastructure, and the innovative ability of entrepreneurs. The Act created the Research and Technology Innovation Fund (hereafter: Fund). The two most important revenue sources of the Fund are the central budget (as legal successor of current Technological Development Program [KMÜFA] and National Research and Development Programs [NKFP] expenditures), and the contribution paid by the wide range of enterprises (except of micro-enterprises, with less than 10 employees) according to a defined rate described in the Act. The innovation contribution is based on the corrected net revenue (net revenue minus purchased goods, materials and services) of the previous year. In case of medium and large sized enterprises the rate of this contribution is 0,2 % of the latter projection base in 2004, the rate is 0,25% in 2005, and it is 0,3% in 2006. Concerning the small companies more favourable keys are applied (2004: 0,05%, 2005: 0,1%, 2006:0,15%, from 2007: 0,2%). In order to promote the research and development activity the commitment for payment of the contribution should be reduced with the amount of direct costs of research and development spent by own sources or ordered from a public research institution or from a non-profit research organisation. The planned amount of the Fund is about 26 billion HUF (about 100 million EUR) in 2004, and a dynamic growth is foreseen for years 2005 and 2006.

Missions of the Fund:

- To give financial assistance for industrial research and technological development activities.
- To promote the creation of R&D and knowledge intensive jobs, workplaces.
- To support the R&D activities of the enterprises and their consortia.
- To support supplementary R&D service sector (technology transfer, technology broker, PR, bridge-building organisations, etc).
- To finance the investments and projects for implementation of new technological environment in the domestic economy.

- To develop the R&D infrastructure in the publicly financed research units.
- To facilitate the Hungarian participation in the international R&D projects.
- To promote researcher mobility.
- To contribute to the expenses of the exploitation and commercialisation of the R&D results.

The preparations have been ongoing since 2003 for a second major legislation, the **Act on Research and Technology Innovation**. The main goal of the law is the development of high value added, knowledge based production and services, improvement of competitiveness of the Hungarian economy, contribution to a sustainable development and, indirectly, to the quality of life of the Hungarian population. The shift of the economy policy into this direction is an inevitable precondition to catch-up with the European Union. The major policy tasks dealt with in this law are as follows:

a) Increasing the R&D expenditures in Hungary, gradually approaching the common European goals (which states: gross expenditure for R&D in the EU should reach 3% of the GDP by 2010, two third of that coming from the private sector). This is not a compulsory requirement but a shared strategic vision, being in close connection with the reinforcement of the European Research Area. It is our own interest to enhance the national R&D and innovation efforts in line with the Growth Initiative, in order to increase the competitiveness of our economy.

b) Strengthening the knowledge base and R&D infrastructure in the business sector, in the public research institutions and in the non-profit research organisations.

c) Development of the human resources for research, development and innovation. Promoting the personal mobility paving the way for the effective knowledge and technology diffusion.

d) Creating a new quality of knowledge driven co-operation and networking between public, non-profit and private organisations. In order to that, the systematic application of demand oriented models in the organisation, financing and technology transfer.

e) The utilisation of intellectual property, including mechanisms to enforce the commercial utilisation of knowledge and technology created by public contribution.

f) Application of organisation models, direct measures and indirect initiatives to compensate the lack of capital and the higher specific R&D costs at SMEs.

g) Simplification of the planning and spending rules of public R&D resources, customisation to the specifics of this area, in order to apply simple, rational and transparent procedures.

h) Rationalisation of the management, co-ordination and implementation functions of the R&D and innovation related government bodies, harmonising with the requirements of a knowledge driven society and the public responsibility.

i) Development of the national and regional organisations promoting technology transfer and SMEs. The bill contains measures for the merging and demand driven transformation of the existing organisations that form a fragmented structure now.

j) The representation of the domestic research and innovation on the relevant international organisations, especially in the EU Framework Programmes and in the European Research Area. Maintaining the science and technology co-operation with other important international partners at bilateral base.



k) Promoting the public understanding and awareness of science and technology, developing fora for societal feedback to form the future science and innovation policies.

The Law on Research and Technology Innovation will be submitted to the Parliament in May 2004.

#### **2.4. Promoting innovation: tax incentives for research and technological activities**

In Hungary, there exist mainly two types of governmental support for R&D and innovation in the private sector: firstly, the tax incentives and secondly, the direct non-refundable state support through calls for proposals.

From January 2001 on, companies can account for their R&D expenditure at 100%. This option is also available for extramural (subcontracted) R&D activity not carried out in the companies themselves, but implemented by public or non-profit research organisation as a subcontract.

Also from January 2001 on, the amortisation (depreciation) of all R&D investments is flexible, and its rate is depending on the company. From January 2003 further incentives were introduced such as the option for tax-free investment reserves up to 500 M HUF, accelerated amortisation of ICT investments, 70% tax release for R&D donations and faster tax reimbursement etc. making the innovative activities and the overall entrepreneurial conditions more favourable.

In addition to that, the corporate taxation rules have been changed from January 2004. To improve the competitiveness of the domestic enterprises, their corporate tax decreases to 16 percent from 18 percent.

The following additional measures will play important role in the Hungarian technology innovation process: 300% RTD tax allowance if the company lab is located at a university or public research institute – from 2004.

Up to the level of the official minimum wage, the employment of PhD, MSc or MBA students is tax free in the field of educational and research activities and other services closely related to these activities.

#### **2.5. Strengthening fundamental research: the National Scientific Research Fund (NSRF)**

It was established in 1986, supervised by the HAS. Since 1991, it has been operating as an independent organisation. The mission of the NSRF is to support basic research, development of R&D infrastructure and scientific work of young researchers. The Laws XXII of 1993 and CXXXVI of 1997 provide the legal base for its operation.

### 3. Main science and technology indicators

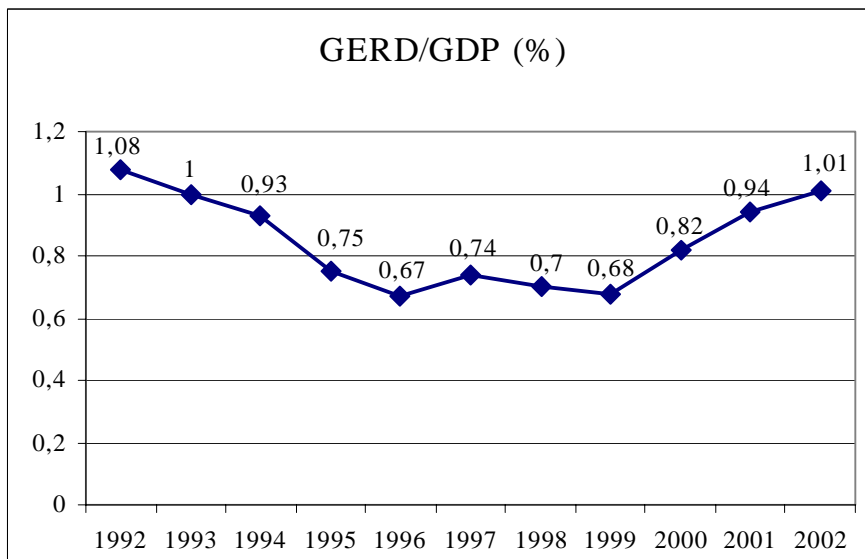
Table 2. Principal data of research and development

Year	Number of R&D units	Calculated R&D staff number (person)	R&D staff number as percentage of active employees	R&D expenditure, total (billion HUF)*	R&D expenditure as percentage of GDP
1991	1 257	29 397	0,63	27,1	1,09
1992	1 287	24 192	0,57	31,6	1,08
1993	1 380	22 609	0,58	35,3	1,00
1994	1401	22 008	0,59	40,3	0,93
1995	1 442	1 401	0,54	42,3	0,75
1996	1 461	19 776	0,55	46,0	0,67
1997	1 679	20 758	0,57	63,6	0,74
1998	1 725	20 315	0,56	71,2	0,70
1999	1 887	21 329	0,56	78,2	0,68
2000	2 020	23 534	0,61	105,4	0,82
2001	2 337	22 942	0,59	140,6	0,94
2002	2 426	23 703	0,61	171,5	1,01

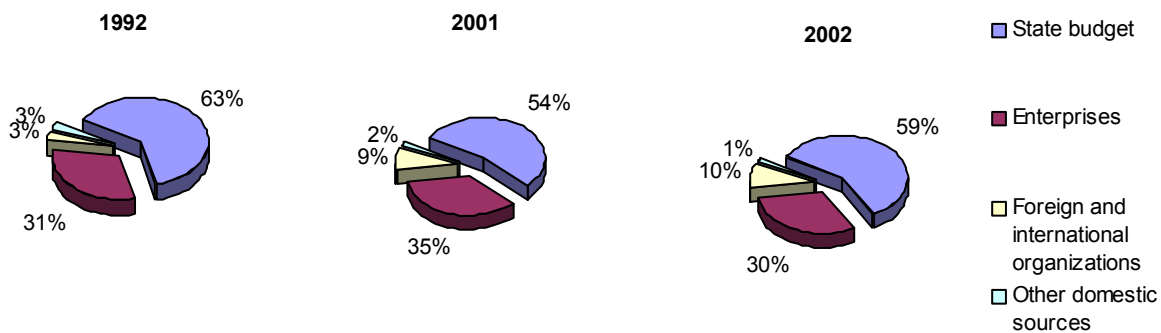
\*Including the honorarium, salary complements of scientific degree and the amounts of state scientific scholarship; excluding the costs of other activities and excluding amortisation in 1999-2002.

Source: Central Statistics Office (CSO)

**Fig. 2. Gross domestic expenditures for R&D (GERD) as a percentage of GDP**



**Fig. 3. R&D expenditure by financial sources**



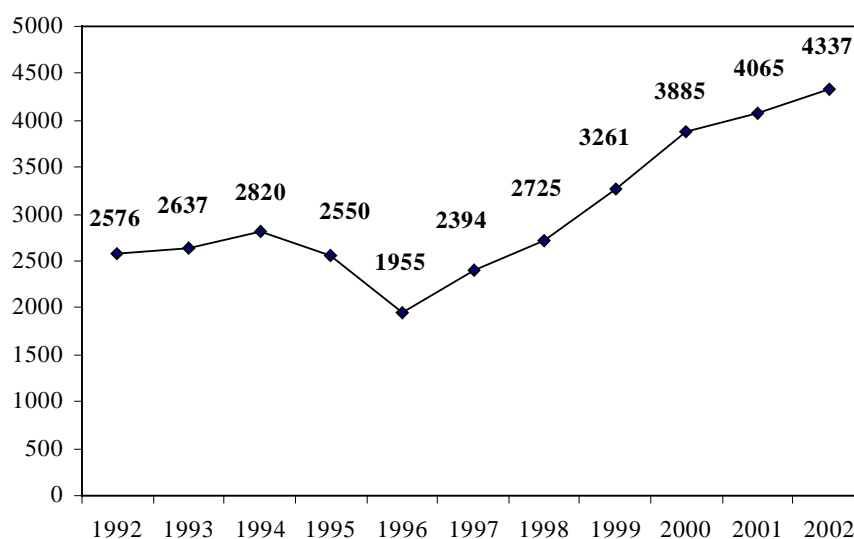
**Table 3. R&D expenditure by types of activity (billion HUF)\***

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Basic research</b>	8,6	10,0	13,0	12,4	14,6	18,3	22,1	22,2	30,4	45,0	53,1
<b>Applied research</b>	10,7	11,0	13,6	14,8	15,4	18,8	25,5	23,3	32,6	39,6	55,4
<b>Experimental development</b>	12,3	14,3	13,7	15,1	16,0	26,5	23,6	30,7	42,4	56,0	63,0

\*Calculated data

Source: Central Statistics Office (CSO)

**Fig. 4. Number of researchers (full time equivalent) in the business sector**



#### **4. International relations in science and technology**

Hungarian R&D organisations have an increasing opportunity to participate in multilateral and bilateral scientific programmes. Over the past decades a large number of international science and technology co-operation links has been developed. Hungary has become full member in most European and Euro-Atlantic research organisations and programmes (e.g. EU R&D Framework Programmes, COST, EUREKA, CERN, EMBL, ESA/PRODEX and the NATO Science Programme).

#### 4.1. Bilateral S&T relations

Hungary has 33 intergovernmental S&T agreements. The number of bilateral projects is between 500-600 in a year. The primary objective is to promote mobility and international co-operation, organising seminars and workshops in the field of interest of science and technology. As to the international aspects of the responsibility for the R&D policy, the bilateral relations are of primary importance

**Table 4. Bilateral S&T agreements**

Partner countries	Beginning of the co-operation	Date of last meeting	Number of approved on-going bilateral projects
Argentina	1974 (A new agreement was signed in 1999)	6/12/2002, Buenos Aires	11
Austria	1969	5/11/2003, Vienna	39
China	2002	22/09/2003, Beijing	35
Croatia	2002	-	-
Czech Republic	2002	26/11/2003, Budapest	19
Finland	1993	14/10/2002, Helsinki	17
Flanders	1966	11/10/2002, Budapest	19
France	1996	31/10/2003, Keszthely	45
Germany	1980 (A new agreement was signed in 1987.)	28/10/2002, Budapest	15
Greece	1979	10-11/04/2002, Budapest	24
India	1974 (A new agreement was signed in 1992.)	14/03/2002, New Delhi	8
Israel	1991	23/10/1998, Jerusalem	There have been 12 joint projects funded in the period 1999–2000. As of 2004, there are no approved bilateral projects.
Italy	1965 (A new agreement was signed in 2003, which must be ratified by the Italian parliament.)	6-7/11/2003, Rome	31 and 2 significant projects
Japan	1979	8/11/2001, Budapest	20
Korea	1989	14/04/2000, Seoul	11
Malaysia	1997	7/10/2003, Budapest	5
Mexico	1977 (A new agreement was signed in 1992.)	1999, New-Mexico	7
Poland	1966	22/01/2004, Warsaw	15
Portugal	1977	11/12/2003, Lisboa	17
Romania	1999	6-7/03/2003, Budapest	20
Russia	1993	17/07/2002, Moscow	13
Slovakia	2002	20/11/2003, Bratislava	-
Slovenia	1994	18/11/2003, Pécs	24
South Africa	1997	05/12/2003, Pretoria	31
Spain	1979	8-9/05/2001, Budapest	26
Thailand	1999	26/06/2002, Budapest	-
The Netherlands	1992	21/01/2002, Budapest	9
Turkey	1989	01/09/2003, Budapest	10
Ukraine	1993 (The agreement was signed in 1995.)	26-27/11/2001, Budapest	10
United Kingdom	1967 (The agreement was renewed in 1987.)	06/06/2002, Budapest	20
United States of America	1989 (The agreement was renewed in 2001)	20/11/2003, Washington	251 (from 1990 to 2003 finished)

## **4.2. Science and technology attachés**

The international scientific relations of the Hungarian Republic are also managed and developed by delegated Science and Technology attachés. They support the international and European integration of the Hungarian S&T community by acquiring and disseminating information and by building connections between institutions. The current Hungarian S&T attaché network was set up in 1992. The basic tasks for the attachés are:

- to monitor and to analyse the science and technology policy and the international relations of the host country, thereby contributing to the formation of the Hungarian R&D policy;
- to give information in the host country about the Hungarian R&D policy, its implementation and opportunities for co-operation;
- to assist Hungarian R&D institutions and organisations in order to establish contacts;
- to monitor the possibilities of participation of Hungarian researchers and R&D institutions in national or international R&D programmes of the host country.

Currently there are S&T attachés at the following 11 cities: Berlin, Brussels (for the S&T relations with the EU Commission), Helsinki, London, Moscow, Paris, Rome, Tel Aviv, Tokyo, Vienna, Washington (view the list of S&T attachés hereinafter).

## **4.3. Multilateral relations**

### *4.3.1. OECD*

Hungary joined the OECD in March 1996. Since that time on the country has been playing an active role in the science and technology policy activity of the OECD as well. The National Office of Research and Technology is representing the country in the Committee for Science and Technology Policy (CSTP) and in its subsidiary working groups, which provides excellent fora for S&T co-operation with industrial countries of the OECD. Beside that, the OECD provides examples and best practices for shaping the S&T policy of the member countries (TIP). The activity of the OECD on the field of S&T indicators (NESTI) is a pioneering exercise, which provides comparable data for every national economy.

### *4.3.2. European Union*

Hungary, as an accession country has close working relations with the member countries of the European Union and with the European Commission. In the preparation for full membership, Hungary has started to elaborate the National Development Plan, which will be the basis for allocation of financial resources from the Structural Funds. In this National Development Plan the NKTH is co-ordinating the research and innovation chapter, within the Economical Competitiveness Operative Programme as described above.

Hungarian interest towards European scientific programmes has been quite intensive since the early nineties, with increasing participation in projects of the framework programmes. The Hungarian government recognized the particular role of science and technology co-operation as a forerunner of, and training ground to, Community membership, so this area became an integral part of the pre-accession strategy. The Community Framework programmes are important tools in achieving our national objectives, and the main aim of our participation is to profit from the synergetic effects with our own policies and programmes.

After successful participation in the PECO, COPERNICUS and INCO programmes Hungary achieved full association to European research by taking part in the 5<sup>th</sup> Research, Technological Development and Demonstration Framework Programme (FP5, 1998-2002)

as well as in the EURATOM Framework Programme, enjoying basically the same rights as the Member States of the EU.

Similarly to other candidate countries, Hungary has joined the 6<sup>th</sup> Framework Programme (FP6, 2002-2006) as an associated candidate country until full membership. The interim period prior to accession in early 2004 will provide a seamless transition to full membership.

Hungarian government officials and experts have taken part as observers at the Programme Management Committee meetings since the beginning of the 5<sup>th</sup> RTD Framework Programme.

Hungary, like other associated candidate countries, was granted observer status (since May 2001) in meetings of CREST (Scientific and Technical Research Committee).

In addition to this, since early 2003 Hungary has been taking part in the work of all other relevant bodies of the European Council (Competitiveness Council, WG on Research, etc.) as an active observer.

The financial and institutional framework of the Hungarian participation is well established. In order to ensure successful participation and the effective dissemination of information in the framework programmes, a network of National Contact Points (NCPs) and R&D liaison offices, was established as early as 1999. This was complemented by setting up a Hungarian R&D Liaison Office in Brussels (HunOR) by a consortium of national organisations responsible for science and research.

This system of the network of NCPs was partially renewed and adapted to the structure and requirements of FP6; however further improvements are envisaged in the future. The renewal of the system of liaison offices was performed with respect to focusing the efforts and at the same time maintaining the thematic and regional coverage .

An application-based system was developed already under FP5 in order to provide support to potential Hungarian partners in scientific consortia. This support scheme will be continued and modernized as well as complemented with new elements during 2004. Funding is available among others for preparatory work to organize or join to research consortia either abroad or within the country, travel support for contract negotiations, legal advice, and information dissemination events or publications.

Experience concerning participation in the framework programmes this far has been favourable.

In the course of the 5<sup>th</sup> Framework Programme, more than 2600 manifested interest towards participation, and more than 600 project proposal submissions were successful. In the first rounds of call for proposals of the 6<sup>th</sup> Framework programme interest for participation was growing steadily, with more than 1000 project partnerships having nearly 1500 Hungarian partners.

The preliminary results show that more than 220 project proposals were ranked and retained for contract negotiations, with nearly 280 Hungarian partners. According to our estimates the success rate of submitted projects with Hungarian participants was around 22%, which corresponds almost precisely to our success rate in FP5. The results from the associated candidate country SSA (Specific Support Actions) calls show that they have been successful in all of the targeted countries, and Hungary was among those who most profited from them.

**Table 5. Hungary's participation in the 5<sup>th</sup> and 6<sup>th</sup> RTD Framework Programme**

**FP5**

Specific Programme	Projects with at least one Hungarian participant	Projects coordinated by Hungarian-based organisations
	<b>Thematic Programmes</b>	
<a href="#">Quality of life and management of living resources</a> LIFE QUALITY	108	5
<a href="#">User-friendly information society</a> IST	90	6
<a href="#">Competitive and sustainable growth</a> GROWTH	95	2
<a href="#">Energy, environment and sustainable development</a> EESD	104	7
	<b>Horizontal Programmes</b>	
<a href="#">Confirming the international role of Community research</a> INCO II	37	29
<a href="#">Promotion and encouragement of SME participation</a> INNOVATION SMEs	13	
<a href="#">Improving human research potential and the socio-economic knowledge base</a> HUMAN POTENTIAL	121	33
	<b>5th (EURATOM) Framework Programme</b>	
<a href="#">Research and Training in the field of Nuclear Energy</a> FP5 EURATOM	57	15
Total	625	97
<b>Specific Programme</b>	<b>Projects with at least one Hungarian participant</b>	<b>Projects coordinated by Hungarian-based organisations</b>

**FP6**

Thematic Programme	Number of Hungarian participations in		Number of projects with at least one Hungarian participant in	
	Submitted proposal (calls 1-2)	Negotiated contracts	Submitted proposal (calls 1-2)	Negotiated contracts
Information society technologies (IST) Programme	420	65	292	54



#### 4.3.3. Other multilateral relations

##### **EUREKA**

EUREKA is a Europe-wide Network for Industrial R&D with the following goals: strengthening European competitiveness, by promoting 'market-driven' collaborative RTD, involving industry and research institutes across Europe, using advanced technologies, resulting in cost-effective products, processes and services. It is a framework through which industry and research institutes from 33 countries and the European Union are developing and exploiting the technologies crucial to global competitiveness and a better quality of life.

Hungary was the first of our region to have the opportunity to join the co-operation in 1992. Hungarian participation has dynamically developed up to the present level. In 2003 there were 28 running projects and 58 finished projects with Hungarian participation.

##### **COST (European Co-operation in the field of Science and Technology)**

COST is an intergovernmental network-forming co-operation in the field of science and technology, co-ordinating national research on European level for harmonising mainly basic and applied research activities of national research institutes, universities and industrial enterprises. Although COST funding is not available for research, the expenses of their co-ordination are covered from the budget of the EU framework programmes. COST has 34 member states + 1 co-operating state (Israel). Presently 30 000 researchers are involved in about 170 running actions. Approximately 600-800 Hungarian scientists of 150 institutes have participated in 251 actions in the last 13 years of our membership.

##### **CERN (European Organisation for Nuclear Research)**

CERN is one of the world's largest scientific laboratories. Founded in 1954, its site is situated on the French-Swiss border west of the city of Geneva. 20 European countries finance the Laboratory. More than 7000 scientists, from laboratories and universities all over the world, work there to study the constituents of matter and the nature of fundamental forces. CERN is currently engaged in the realisation of a new accelerator, the Large Hadron Collider (LHC), where high-intensity proton beams will collide head-on at unprecedented energies. Hungary participates in its two future experiments: in the Compact Muon Solenoid (CMS) and in the ALICE experiments.

Over the years, CERN has become an important centre for transfer of new technologies to European industry and for training young people in a variety of technical fields. Everybody is now using the most well known spin-off from CERN research, the World Wide Web, which was invented at CERN to improve communication between the international collaborators.

Hungary joined CERN in 1992, since then more than 100 Hungarian researchers have participated in the works at the experiments.

##### **NATO Science Programme**

The NATO Science Programme offers support for international collaboration between scientists from countries of the Euro-Atlantic Partnership Council (EAPC). The support for collaboration is channelled through a range of different mechanisms or activities, which are designed to create enduring links between researchers in different countries, which is essential to progress in science, with the objective of contributing to overall security and stability. The NATO Science Programme was grouped into four sub-programmes: Science Fellowships, Co-operative Science and Technology, Research Infrastructure Support, Science for Peace. Hungary has been especially successful in Science for Peace sub-programme: 13 Hungarian projects have been supported till September 2002. Since 1999 the total Hungarian budget for the Science Fellowships sub-programme has been approximately 140 million HUF. This provided opportunity for 90 Hungarian scientists, 25 researchers from Partners Countries and 11 scientists from different NATO countries to participate in the sub-programme from the first call in March 2001 to December 2003. From 2004 the NATO Science Fellowships Programme will be terminated.

## **5. Potential for international science and technology co-operation with Hungary**

The strengths of the Hungarian national innovation system make Hungary an attractive partner and also a promising site for international scientific co-operation:

- stable political and economic environment ( stable growth rate, decreasing inflation rate and unemployment rate),
- strengths in national innovation system, strong knowledge base (high educational level, outstanding universities, institutions of HAS),
- motivated SMEs,
- strong science areas (IT, biotechnology, agro-economy, chemistry, pharma),
- internationally embedded Hungarian national innovation system (e.g. EU Framework programme).

Foreign partners are encouraged to co-operate with Hungarian partners in all scientific fields. Most of the Hungarian calls for proposals are open to foreign partners too, provided, they cover their own costs in the research consortia.

## 6. Relevant information sources

National Office of Research and Technology (NKTH)

Address: H-1052 Budapest, Szervita tér. 8., Hungary

Website: [www.nkth.gov.hu](http://www.nkth.gov.hu)

<i>Topic</i>	<i>Contact person:</i>
For R&D strategy:	<i>Dr. Tamás Balogh</i> , General Director Department for R&D Strategy National Office of Research and Technology H-1052 Budapest, Szervita tér 8., Hungary Phone: +361-484-2543 Fax. +361-266-2056 Email: <a href="mailto:tamas.balogh@nkth.gov.hu">tamas.balogh@nkth.gov.hu</a>
For technology programmes:	<i>Mr. Dezső Bojársky</i> , General Director Department for Advanced Technologies National Office of Research and Technology H-1052 Budapest, Szervita tér 8., Hungary Phone: +361- 484-2513 Fax: +361 –317- 0349 E-mail: <a href="mailto:dezso.bojarszky@nkth.gov.hu">dezso.bojarszky@nkth.gov.hu</a>
For international R&D affairs:	<i>Mr. Ferenc Kleinheincz</i> , General Director Department for International R&D Affairs National Office of Research and Technology H-1052 Budapest, Szervita tér 8., Hungary Phone: +361-484-2565 Fax. +361-266-0801 Email: <a href="mailto:ferenc.kleinheincz@nkth.gov.hu">ferenc.kleinheincz@nkth.gov.hu</a>
For multilateral international relations (EUREKA, COST, CERN and NATO Science Programmes):	<i>Mr. Pál Koncz</i> , Dep. General Director Multilateral Co-operation Unit Department for International R&D Affairs National Office of Research and Technology H-1052 Budapest, Szervita tér 8., Hungary Phone: +361 -484- 2584 Fax: +361- 266- 2055 E-mail: <a href="mailto:pal.koncz@nkth.gov.hu">pal.koncz@nkth.gov.hu</a>
For EU matters, including the Framework Programmes:	<i>Dr. Attila Zsigmond</i> , Head EU S&T Co-operation Unit, Department for International R&D Affairs National Office of Research and Technology H-1052 Budapest, Szervita tér 8. Hungary Phone: +361 –484-2598 Fax: +361- 266- 2055 E-mail: <a href="mailto:attila.zsigmond@nkth.gov.hu">attila.zsigmond@nkth.gov.hu</a>
For bilateral aspects of the international S&T cooperation and for matters concerning S&T attachés and R&D promotion:	<i>Dr. Béla Kardon</i> , Head Unit of R&D Bilateral International Relations, Unit of S&T Attachés and Information Department for International R&D Affairs National Office of Research and Technology H-1052 Budapest, Szervita t.ér 8., Hungary Phone: +36-1-484-2571 or +36-1-484-2567 Fax. +36-1-266-0254 Email: <a href="mailto:bela.kardon@nkth.gov.hu">bela.kardon@nkth.gov.hu</a>

### ***Further important S&T websites***

Agency for Research Fund Management and Research Exploitation [www.kutatas.hu](http://www.kutatas.hu)  
Ministry of Education [www.om.hu](http://www.om.hu)  
Ministry of Economy and Transport [www.gkm.hu](http://www.gkm.hu)  
Hungarian Academy of Sciences [www.mta.hu](http://www.mta.hu)  
Hungarian Scientific Research Fund [www.otka.hu](http://www.otka.hu)  
Bay Zoltán Foundation for Applied Research [www.bzaka.hu](http://www.bzaka.hu)  
Collegium Budapest [www.colbud.hu](http://www.colbud.hu)  
Hungarian Patent Office [www.hpo.hu](http://www.hpo.hu)  
Hungarian Competition Office [www.gvh.hu](http://www.gvh.hu)  
Hungarian Standards Institution [www.mszt.hu](http://www.mszt.hu)  
Hungarian Central Statistical Office [www.ksh.hu](http://www.ksh.hu)  
Association of Hungarian Innovation [www.innovacio.hu](http://www.innovacio.hu)  
Association of Hungarian Inventors [www.inventor.hu](http://www.inventor.hu)  
Association of Hungarian Industrial Parks [www.datanet.hu/ipe](http://www.datanet.hu/ipe)  
Federation of Technical and Scientific Societies [www.mtesz.hu](http://www.mtesz.hu)  
Hungarian Academy of Engineering [www.mernokakademia.hu](http://www.mernokakademia.hu)  
Hungarian Science and Technology Foundation [www.tetalap.hu](http://www.tetalap.hu)  
National Technical Information Centre and Library [www.omikk.bme.hu](http://www.omikk.bme.hu)  
GKI Economic Research Co. [www.gki.hu](http://www.gki.hu)  
INNOSTART National Business Innovation Centre [www.innostart.hu](http://www.innostart.hu)  
Institute for Economic Analysis and Informatics [www.ecostat.hu](http://www.ecostat.hu)  
KOPINT-DATORG Economic Research, Marketing and Computing Company Limited  
[www.kopdat.hu](http://www.kopdat.hu)

### ***List of the Hungarian state universities***

Budapest University of Economic Sciences and Public Administration ([www.bkae.hu](http://www.bkae.hu))  
Budapest University of Technology and Economics ([www.bme.hu](http://www.bme.hu))  
University of Debrecen ([www.klte.hu](http://www.klte.hu))  
Eötvös Loránd University, Budapest ([www.elte.hu](http://www.elte.hu))  
Liszt Ferenc Academy of Music, Budapest ([www.liszt.hu](http://www.liszt.hu))  
Hungarian University of Craft and Design, Budapest ([www.mie.hu](http://www.mie.hu))  
University of Miskolc ([www.uni-miskolc.hu](http://www.uni-miskolc.hu))  
University of Western Hungary, Sopron ([www.nyme.hu](http://www.nyme.hu))  
University of Pécs ([www.pte.hu](http://www.pte.hu))  
Semmelweis University, Budapest ([www.sote.hu](http://www.sote.hu))  
University of Szeged ([www.u-szeged.hu](http://www.u-szeged.hu))  
University of Veszprém ([www.vein.hu](http://www.vein.hu))  
Szent István University, Gödöllő ([www.szie.hu](http://www.szie.hu))  
Zrinyi Miklós University of Defense, Budapest ([www.zmne.hu](http://www.zmne.hu))  
Academy of Drama and Film, Budapest ([www.filmacademy.hu](http://www.filmacademy.hu))

**Research and development institutes of the HAS by scientific fields**

Natural Sciences And Mathematics	Life Sciences	Social Sciences Including Humanities
<ul style="list-style-type: none"> <li>• “Rényi Alfréd” Mathematical Institute (<a href="http://www.renyi.hu">www.renyi.hu</a>)</li> <li>• Astronomical Institute (Konkoly Observatory) (<a href="http://www.konkoly.hu">www.konkoly.hu</a>)</li> <li>• Chemical Research Centre (<a href="http://www.chemres.hu">www.chemres.hu</a>)</li> <li>• Computer and Automation Research Institute (<a href="http://www.sztaki.hu">www.sztaki.hu</a>)</li> <li>• Institute of Nuclear Research (<a href="http://www.atomki.hu">www.atomki.hu</a>)</li> <li>• KFKI Atomic Energy Research Institute (<a href="http://www.kfki.hu/~aekihp">www.kfki.hu/~aekihp</a>)</li> <li>• KFKI Research Institute of Solid State Physics and Optics (<a href="http://www.szfki.hu">www.szfki.hu</a>)</li> <li>• KFKI Research Institute for Technical Physics and Material Science (<a href="http://www.mfa.kfki.hu">www.mfa.kfki.hu</a>)</li> <li>• KFKI Research Institute For Particle and Nuclear Physics (<a href="http://www.rmki.kfki.hu">www.rmki.kfki.hu</a>)</li> <li>• RCES (Research Centre for Earth Sciences) (<a href="http://www.core.hu/fkk/fkk_eng.html">www.core.hu/fkk/fkk_eng.html</a>)</li> <li>• RCES Geodetical and Geophysical Research Institute (<a href="http://www.ggki.hu">www.ggki.hu</a>)</li> <li>• RCES Geographical Research Institute (<a href="http://www.mtafki.hu">www.mtafki.hu</a>)</li> <li>• RCES Laboratory for Geochemical Research (<a href="http://www.core.hu/gkl/gkl_eng.html">www.core.hu/gkl/gkl_eng.html</a>)</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural Research Institute (<a href="http://www.mgki.hu">www.mgki.hu</a>)</li> <li>• Balaton Limnological Research Institute (<a href="http://tres.blki.hu/">http://tres.blki.hu/</a>)</li> <li>• Institute of Ecology and Botany (<a href="http://www.botanika.hu">www.botanika.hu</a>)</li> <li>• Institute of Experimental Medicine (<a href="http://www.koki.hu">www.koki.hu</a>)</li> <li>• Plant Protection Institute (<a href="http://www.nki.hu">www.nki.hu</a>)</li> <li>• Research Institute for Soil Science and Agricultural Chemistry (<a href="http://www.taki.iif.hu">www.taki.iif.hu</a>)</li> <li>• Biological Research Centre (<a href="http://www.szbk.u-szeged.hu">www.szbk.u-szeged.hu</a>)</li> <li>• Veterinary Medical Research Institute (<a href="http://www.vmri.hu">www.vmri.hu</a>)</li> </ul>	<ul style="list-style-type: none"> <li>• Research Centre for the Social Sciences</li> <li>• Archeological Institute (<a href="http://www.archeo.mta.hu">www.archeo.mta.hu</a>)</li> <li>• Institute of Ethnology (<a href="http://www.neprajz.mta.hu">www.neprajz.mta.hu</a>)</li> <li>• Institute of History (<a href="http://www.tti.hu">www.tti.hu</a>)</li> <li>• Institute of Legal Studies</li> <li>• Institute for Literary Scholarship (<a href="http://www.iti.mta.hu">www.iti.mta.hu</a>)</li> <li>• Institute for Musicology (<a href="http://www.zti.hu">www.zti.hu</a>)</li> <li>• Institute of Philosophical Research (<a href="http://www.phil-inst.hu">www.phil-inst.hu</a>)</li> <li>• Institute for Psychology (<a href="http://www.mtapi.hu">www.mtapi.hu</a>)</li> <li>• Institute of Sociology (<a href="http://www.socio.mta.hu">www.socio.mta.hu</a>)</li> <li>• Institute of Art History (<a href="http://www.arthist.mta.hu">www.arthist.mta.hu</a>)</li> <li>• Research Institute for Linguistics (<a href="http://www.nytud.hu">www.nytud.hu</a>)</li> <li>• Centre for Regional Studies (<a href="http://www.rkk.hu">www.rkk.hu</a>)</li> <li>• Institute of Economics (<a href="http://www.econ.core.hu">www.econ.core.hu</a>)</li> <li>• Institute for Political Sciences (<a href="http://www.mtapti.hu">www.mtapti.hu</a>)</li> <li>• Institute for World Economics (<a href="http://www.vki.hu">www.vki.hu</a>)</li> <li>• Institute for the Study of Ethnic-National Minorities (<a href="http://www.mtaki.hu">www.mtaki.hu</a>)</li> </ul>

### Science and Technology Attachés

Post - Name of S&T attaché Embassy	E-mail address
<b>VIENNA - István Mányi</b>	<a href="mailto:imanyi@huembvie.at">imanyi@huembvie.at</a>
Embassy of the Republic of Hungary	
<b>BERLIN - Judit Bádonfai</b>	<a href="mailto:JBadonfai@ungarische-botschaft.de">JBadonfai@ungarische-botschaft.de</a>
Embassy of the Republic of Hungary	
<b>BRUSSELS - Dr. László Szendrődi</b>	<a href="mailto:Laszlo.Szendrodi@hunrep.be">Laszlo.Szendrodi@hunrep.be</a>
Mission of the Republic of Hungary to the EU	
<b>HELSINKI - Péter Grosschmid</b>	<a href="mailto:science@unkari.fi">science@unkari.fi</a>
Embassy of the Republic of Hungary	
<b>LONDON - Ildikó Szalai-Szűcs</b>	<a href="mailto:ISzalai-Szucs@huemblon.org.uk">ISzalai-Szucs@huemblon.org.uk</a>
Embassy of the Republic of Hungary	
<b>MOSCOW – Dr. Árpád Erdélyi</b>	<a href="mailto:aerdelyi@huembmow.macomnet.ru">aerdelyi@huembmow.macomnet.ru</a>
Embassy of the Republic of Hungary	
<b>PARIS – Dr. György Pálfi</b>	<a href="mailto:gypalfi@amb-hongrie.fr">gypalfi@amb-hongrie.fr</a>
Embassy of the Republic of Hungary	
<b>ROME – Dr. Mária Pánczél</b>	<a href="mailto:mpanczel@huembrom.it">mpanczel@huembrom.it</a>
Embassy of the Republic of Hungary	
<b>TEL-AVIV - László Dvorszki</b>	<a href="mailto:huscience@bezeqint.net">huscience@bezeqint.net</a>
Embassy of the Republic of Hungary	
<b>TOKYO - Gyöngyi Kanyár</b>	<a href="mailto:huembsta@gol.com">huembsta@gol.com</a>
Embassy of the Republic of Hungary	
<b>WASHINGTON – Dr. István Takács</b>	<a href="mailto:itakacs@huembwas.org">itakacs@huembwas.org</a>
Embassy of the Republic of Hungary	