

4. SCIENCE AND TECHNOLOGY IN SPAIN

4.1. The Spanish Science and Technology Scheme

The Spanish Science and Technology System scheme is relatively small in comparison to the economical position of Spain in the world, as well as in relation to its percentage of the GNP dedicated to R&D and to the number of scientists. The gradual increase of the public funds allocated to R&D however, is altering this situation. Today, Spain is one of the countries with the fastest increasing percentage of spending in R&D.

In 2002, the spending in R&D in Spain reached 1.03% of the GNP. The spending in the private sector (companies and non profit making institutions) counted for 54.8%, while the spending in the public sector (Administration and universities) was good for 42.2%. The personnel dedicated to R&D represented 6.9% of the total active population, while the number of researchers was 4.4%. These two indicators, used by the OECD for international comparisons, have been increasing during the last two decades. However the increase in 2001 was less than the year before.

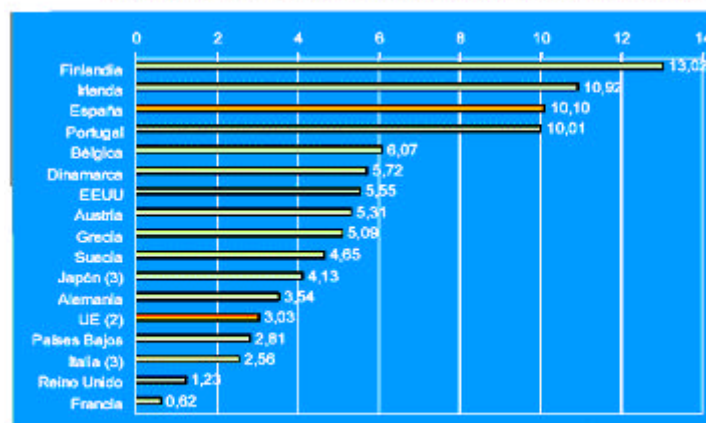
According to the information from the CSO, 33% of the total personnel dedicated full-time to R&D are women. Their participation in the different institutional sectors is however, very unequal, ranging from 44% in the sector of higher education to 20% in companies. Where research is concerned, the proportion of women in the sector of Public Administration is 43%

Gasto en I+D

Fuente: OECD. Main Science and Technology Indicators. Mayo 2003(DATOS 2001)
*2002

Pais	% Gasto en I+D respecto al PIB	% Gasto en I+D ejecutado por el sector empresarial
Austria	1,90	-
Alemania	2,49	70,5
España*	1,03	52,4
Finlandia	3,40	71,1
Francia	2,20	62,4
Irlanda	1,17	68,5
Portugal	0,83	32,6
Reino Unido	1,90	67,4
Suecia	4,27	77,6
UE	1,93	64,5
EEUU	2,82	74,4

Gasto en I+D. Tasa media de crecimiento anual



Key Figures 2002. Comisión Europea
Período 1995-2000

R&D in the Autonomous Districts

While the competence for research and development still belongs to the General Administration of Spain, the Autonomous Districts have launched various initiatives during the last years. The economical and institutional importance of the autonomous politics concerning R&D is very diverse. Generally speaking, the Autonomies concentrate their industrial and technological development policy on benefits for companies and on the creation of technological zones and organisations for administrative support. Until now, there has not been any coordination, frame or reference between them.

Total of domestic expenditure in R&D per Autonomous District (AD) (percentage of the GNP of each AD in 2001)

Autonomous District	% of GNP
Madrid	1.75
Catalonia	1.10
Basque Country	1.38
Navarra	1.03
Castilla - León	0.80
Valencia	0.70
Galicia	0.70
Aragon	0.69
Asturias	0.67
Canary Islands	0.53
Andalusia	0.61
Murcia	0.65
La Rioja	0.49
Cantabria	0.55
Castilla - La Mancha	0.32
Balearic Islands	0.25
Extremadura	0.59

Source: CSO

You can find more information about this in the *Memorandum of Activities of R&D 2001* and in the *Memorandum of the Ministry of Science and Technology 2001-2002*, both of them temporarily available at the web page of the former Ministry of Science and Technology www.mcyt.es ("publications")

4.2. Structure of the Spanish Science and Technology Scheme.

The present Spanish Science, Technology and Company scheme was established as a result of the Science Law of 1986. One of the main objectives of this law was to create a better coordination between the different scheme agents. The State organises the science and technology policies through the public sector. This is done according to the National Plan for Research, Development and Technical Innovation. At present, the National Plan 2004-2007 is in force.

Inter Ministerial Commission of Science and Technology (CICYT)

The Inter Ministerial Commission of Science and Technology (CICYT) is the main state organ for science and technology politics, is responsible for planning, evaluation, coordination and follow-up. The CICYT is chaired by the National Presidency and composed by the ministries involved in the execution of the science and technology policy: Ministry of Education and Science, Ministry of Industry, Tourism and Commerce, Ministry of Foreign Affairs and Cooperation, Ministry of Economy and Finance, Ministry of Defense, Ministry of Health and Consumption, Ministry of Environment, Ministry of Employment and Social Issues.

The CICYT is assisted by two councils:

Advisory council for Science and the Technology

Is the advising council of the CICYT to promote the participation of the scientific community and the economic and social agents in the drafting, follow up and evaluation of scientific policy. All the agents carrying out research activities are represented in this council.

General advice of Science and the Technology

Is the advising council of the CICYT to promote the coordination of the 17 Autonomous Districts in Spain (Comunidades Autónomas), and the coordination of these with the Central Administration of the State.

To facilitate the task of development and execution of the R&D&I policy, the CICYT has delegated its competences to the Ministry of Education and Science (MEC).

Ministry of Education and Science

After the national elections in March 2004 the Ministry of Science and Technology disappeared and its competences in sciences were transferred to the new Ministry of Education and Science <http://www.mec.es>

Under the patronage of the Ministry of Education and Science (MEC) the Spanish Foundation for Science and Technology (FECYT) carries out its activity committed to identify opportunities and necessities of the Spanish System of Science and Technology, offering the different stakeholders a permanent and flexible service. FECYT is the organisation that coordinates in Spain the implementation of the Spanish Network of Mobility Centres, this is an European initiative aiming to foster the mobility of researchers in Europe by providing them with information about the different aspects of life, work and culture in the European countries.

Website: www.fecyt.es

4.3. R&D Organisations

OPI's

The Public Organisations for Research (OPI) are the main actors in the Research and Innovation Scheme, as well as for their part as intermediary in well-defined programmes of the National Plan, as for their work in the execution of an important part of the R&D&I activities, financed by public funds. The OPI's are:

OPI	Web page	Info in English	Telephone
Superior Council for Scientific Research (CSIC)	www.csic.es	yes	91 585 5000
Organisation for Energy, Environmental and Technological Research (CIEMAT)	www.ciemat.es	yes	91 346 6000
National Institute for Technological Agricultural and Alimental Research (INIA)	www.inia.es		91 3473900
Spanish Institute for Oceanography	www.ieo.es	yes	91 597 4443 91 417 5411
Geological and Mining Institute of Spain (IGME)	www.igme.es		91 349 5700

Following organisations also fall under the "Science Law", where the recruitment of personal is concerned:

Organisation	website	Info in English	Telephone
Health Institute Carlos III	www.isciii.es	yes	
National Institute for Air and Space Travel (INTA)	www.inta.es	yes	91 520 1200
Study Centre for Experiments of Public Works (CEDEX)	www.cedex.es	yes	91 335 73 06 91 335 73 07 91 335 73 15

Other publicly funded organisations:

Organisation	website	Info in English	Telephone
Hull Testing Tank – del Pardo (CEHIPAR)	www.cehipar.es	yes	91 376 21 00
Centre for Sociological Research (CIS)	www.cis.es	yes	91 580 76 00
Centre for Political and Constitutional Studies (CEPCO)	www.cepc.es	yes	91 540 19 50
Canarian Astrophysical Institute	www.iac.es		922 605 200

(IAC)			
Institute for Tax Studies (IEF)	www.minhac.es/ief/		91 339 8915
DGAM – General Management of Armament and Material (Ministry of Defence)	www.mde.es/mde/armas/armas.htm		91 395 5000
National Geographical Institute	http://www.geo.ign.es/		91 5975000 91 5977000

R&D at Universities

Universities are the main source for research in Spain. In fact, according to data from the year 2002 from the former Ministry of Science and Technology (MICYT), the importance of universities in the whole scheme is considerable: they execute 30% of the total R&D spending and employ 55% of all researchers and 41% of all personal dedicated to R&D. You can find a full list of universities of the Spanish research net on the following web page: <http://www.rediris.es/recursos/centros/univ.es.html>

R&D in Companies

Although Spanish companies are increasingly aware of the necessity of adapting themselves to the new situation in the world (according the OECD, R&D spending of the big European companies has increased by 20% during the last ten years. In Spain by 50%), the available indicators show us that the technological situation and innovating capacity of the Spanish companies are inferior to the average of their European colleagues. However, the Spanish company network presents a similar increase and the participation in most innovative and dynamical sectors has increased during the last few years. (source MICYT 2001-2002)

Following an inquiry of the CSO about technological innovation in the companies in 2000, only 19.8% of the Spanish companies (29,228) are innovative and only 14.5% of them execute systematically R&D. The effort of the Spanish company in R&D is notably inferior to what a European company executes on average. The €3,068.99 million invested in R&D by companies in 2000 (54% of the total) only represents 0.50% of the GNP, while the average investment on a community basis, reaches 1.15% (source MICYT 2001-2002)

One of the objectives of the current National R&D&I Plan is to increase systematically the number of Spanish companies which develop technology and to achieve a better use of the R&D results by those companies.

Gasto en I+D ejecutado por el sector empresarial 1990-2002



Fuente: INE. Datos estimados para 2002

Tecnociencia web portal

The former Ministry of Science and Technology (MCYT), through the FECYT, placed an internet communication site at the disposal of companies and units of scientific and technological research (www.tecnociencia.es). Techno-science is a meeting place between the world of research and the world of the company, which facilitates and promotes the exchange of scientific and technological knowledge on a fast and efficient way.

Its objective is to facilitate cooperation between the various agents of the science and technology scheme so that the results of R&D projects reach the entrepreneurial sector and contribute to the improvement of its productive processes.

Large-scale Scientific Facilities (GIC)

Large-scale scientific facilities (GIC) are unique or exceptional facilities. Their capital expenditure and/or maintenance costs are relatively high in relation to the invested R&D budget in this area. Their importance and strategic R&D character justifies the access for the whole R&D collective and the society in itself. There is also an advisory body for the Large-scale Scientific Facilities.

If you want more information about the following large-scale facilities, please visit the links which appear on the web page of FECYT: www.fecyt.es

1. Spanish basis on Antarctica "Juan Carlos I"
2. Boat for Oceanographic Research "Hespérides"
3. Boat for Oceanographic Research "García del Cid"
4. Astronomic Centre of Yebeas
5. Astrobiology Centre
6. Fusion and Thermo-Nuclear Installation TJ-II
7. General Laboratory Assaigs and Research
8. Astrophysics Observatory of the Canary Islands
9. Astronomical Observatory of Madrid
10. Planetarium of the Civil Marine School of Santander
11. Planetarium of Madrid
12. Planetarium of Pamplona
13. Red Iris and Super Computers
14. White Hall of the National Centre of Micro Electronics
15. Zaintek, Technological Vigilance Service and Competitive Intelligence

Large-scale International Facilities in Spain:

1. Astronomic Centre Calar Alto
2. Observatories del Teide
3. Observatory Roque de los Muchachos (Big Telescope of the Canary Islands)
4. IRAM, Radio-Astronomical Millimetric Institute (www.iram.es)