



Bilateral International R&D Cooperation Policies of the EU Member States

Volume 2: Compendium of Country Reports

Final Report

Technopolis Group

**John Clark
Jari Kuusisto
Maureen Lankhuizen
Luca Serafini
Paul Simmonds
James Stroyan
Robert Triendl
Katharina Warta
Shaun Whitehouse**

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Notice

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Bilateral International R&D Cooperation Policies of the EU Member States

Volume 2: Compendium of Country Reports

1 Introduction

This is the 'Volume 2: Compendium of Country Reports', the second volume of a two-volume report from the study 'Bilateral International R&D Co-operation Policies of the EU Member States' for DGXII (Contract Number ERBHPV2-CT-1999-0009).

The aim of the study was to establish, at Member State level, the number of centralised, systematic schemes promoting bilateral R&D co-operation with other countries. The results of the study are intended to form the basis of a chapter in the next edition of the European Report on Science and Technology Indicators (REIST), which has been reported in a companion paper.

To collect the required primary data, it was first necessary to identify those ministries and other administrations in each member state responsible for the inception and subsequent administration of that member state's bilateral R&D agreements. For each administration, we then required a policy statement concerning bilateral co-operation, and then a listing of all bilateral agreements, detailing as far as possible

- Title of the agreement
- Partner country and institution with which the agreement is signed
- Legal basis of the agreement (contractual, MoU)
- Start/end dates, review periods
- Policy rationale of the agreement (Goodwill; Strategic, e.g. targeting particular technological developments; Infrastructure, e.g. joint use of facilities)
- Specificity (Open or subject specific; if the latter, the thematic coverage)
- Type of research co-operation supported (exchange of researchers, joint research etc.)
- Budget associated with the agreement
- Activities supported to date: numbers of researchers, numbers of actions

This document comprises a series of Country Reports one for each of the 15 EU Member States (except Luxembourg) and, for comparison, the US and Japan. Each report follows a broadly similar structure and includes a description of national policy on bilateral R&D agreements and selected agreements.

2 Belgium

2.1 Introduction

Science and technology policy in Belgium is decentralised as a result of the country's federal system and the coexistence of five governments, i.e. the federal government and the governments of the Flemish Community, the Walloon Region, the Brussels Capital Region and the French Speaking Community. Each one of the governments has its own policy and instruments. The Brussels Capital Region focuses on innovation in firms rather than R&D.¹

The federal and regional governments share the same view on the issue of international R&D cooperation. For all three, the preferred mode of international R&D cooperation is membership of European *multilateral* research programmes and networks, such as:

- EUREKA, COST, European Space Agency
- The EU Framework RTD Programmes
- Airbus

Bilateral R&D agreements are less important policy instruments. Both the federal and regional governments are signatories to bilateral R&D agreements, but for all three governments these scientific agreements are part of a broader suite of policy tools that underpin relationships – and trade – between the countries concerned. Bilateral R&D agreements therefore are not motivated in the first instance by the advancement of scientific understanding or capability but rather by international relations and economic policy. This is not to say that the bilateral agreements do not seek to make positive contributions to the research activity and networks that exist between the scientific constituencies of the signatory countries.

The main signatory bodies of bilateral R&D agreements at a 'central' level in Belgium are the federal government, the governments of the Flemish Community, the French Community and the Walloon Region, the Fund for Scientific Research – Flanders (FWO) and the National Fund for Scientific Research (FNRS).² Governmental and inter-organisational agreements are discussed in turn.

Cooperation in the context of bilateral R&D agreements involves first and foremost cooperation in joint research projects. The governmental agreements, as well as the agreements of FWO, focus on this kind of cooperation. In addition, the agreements of FWO and FNRS promote the exchange of individual researchers for short or longer periods of time.

For the federal government, as well as the Flemish and Walloon governments and FWO, it is the case that their bilateral R&D agreements foresee the same kind of

¹ Because of their non-R&D focus, we omit from further analysis the Brussels Capital Region.

² FNRS - Fonds National de la Recherche Scientifique

cooperation with all their partner countries and administrations. This implies that there are no differences *ex ante* in cooperation with different countries. It is not the case that with some countries a different mode of cooperation is pursued than with others. The programmes under the bilateral agreements in Belgium are uniform in this respect.

The bilateral R&D agreements in Belgium do not have a scientific *a priori*. The subject of cooperation is open. Therefore, the scientific discipline of cooperation depends on what projects are selected for funding in the context of bilateral R&D cooperation and vary from one year (i.e. one call) to another.

2.2 Intergovernmental agreements

We have identified a total of 80 agreements that exist between the Belgian Governments (Federal, French Community, Walloon and Flemish) and public administrations in 32 other countries. Exhibit 1 lists the countries with which such bilateral agreements exist.

Exhibit 1 Partner countries to bilateral R&D agreements with Belgium

Federal government	French Community Government	French Community and Walloon government	Flemish government
Argentina	Argentina	Bolivia	Argentina
Bulgaria	Bolivia	Bulgaria	Brazil
China	Brazil	Burkina Faso	Bulgaria
Poland	Burkina Faso	Chile	Chile
Russia	Burundi	Haiti	China
Ukraine	Chile	Hungary	Czech Republic
	China	Luxembourg	Estonia
	Czech Republic	Poland	Hungary
	France	Romania	Japan
	Hungary		Latvia
	Italy		Lithuania
	Japan		Mexico
	Mexico		Netherlands
	Poland		Poland
	Taiwan		Quebec
	UK		Romania
	USA		Russia
	Vietnam		Slovakia
			Slovenia
			South Africa
			Taiwan
			UK
			USA

Sources: various³

The agreements of the federal government reveal an emphasis on countries in Central and Eastern Europe and China, which is seen as an important emerging market and an increasingly important figure in geopolitics. This focus is a result of

³ Federal Office for Scientific, Technical and Cultural Affairs; Ministry of the Flemish Community, Science and Innovation Administration, Science Division; Ministry of the Walloon Region, Direction Generale des Technologies, de la Recherche et de l'Energie; Source: Council of Rectors of the universities of the French Community in Belgium (CREF) and General Commission for International Relations (CGRI)

the governments' efforts during the past decade to pursue closer integration of Central and Eastern European countries within the EU. Formal bilateral R&D agreements are considered to be a good bridgehead and precursor of economic and political integration. In Belgium, we have a good example of bilateral scientific cooperation being used as an instrument of foreign policy first and a means to advance scientific understanding second. The agreements of the Flemish government mirror the federal government, but with the addition of agreements with Chile, Quebec and South Africa. The geographical mixture of the French Community government and the Walloon government are markedly different to the federal and Flemish partnerships, but while the geographical spread is distinct the individual agreements are motivated similarly by international relations. In this case, however, it is not European enlargement but historical ties and considerations connected with the French language and culture that are driving cooperation.

Only the agreement between the French Speaking Community and Romania is particularly focused on science and technology. With the agreement ratified in June 2000, there has not been any substantial implementation of the agreement yet. The agreements between the French Speaking Community on the one hand, and Chile, Bolivia and Burkina Faso on the other, have been complemented at a later date by agreements that also include the Walloon Region. The agreements that include the Walloon Region have a more specific focus. For instance, in the case of the bilateral agreement between the French Speaking Community and the Walloon Region and Bolivia, the co-operation between the French Speaking Community and Bolivia focuses on broad issues:

- University and scientific co-operation
- Education
- Culture
- Youth and permanent education

On the other hand, the Walloon Region and Bolivia intend to co-operate in specific areas including:

- Economic matters (economic growth, innovation, restructuring, industrial initiative, external trade, etc)
- Scientific and technological research
- Agricultural policy

Notwithstanding differences in the number and geographical profile of the partner countries, the content and motive of the bilateral R&D agreements of the three governments are quite uniform. They envisage stable and long-term relationships. This is reflected in the fact that the agreements are legally binding and do not specify an end date. In this way, permanent cooperation is pursued. Nevertheless, the agreements are reviewed at regular intervals. For the agreements of the regional governments the review period is three years. In the case of the agreements of the federal government, mixed committees of representatives from both countries meet every two years to review the situation on bilateral cooperation and to give joint direction to future joint projects. Moreover, the governmental agreements envisage similar kinds of cooperation and all focus on the support of joint research projects.

2.3 Inter-administration agreements

Turning to organisational agreements, the Fund for Scientific Research – Flanders, (FWO), has bilateral R&D agreements too. FWO supports fundamental research in universities in the Flemish Region and institutes for scientific research. In fact, FWO has 22 bilateral R&D agreements with analogous scientific administrations abroad. Exhibit 2 lists the home countries of partner organisations of FWO.

Exhibit 2 Home countries of partner organisations of FWO

Argentina	Japan	Slovenia
Brazil	Mexico	Taiwan
Bulgaria	Poland	UK
China	Romania	USA
Czech Republic	Russia	
Hungary	Slovakia	

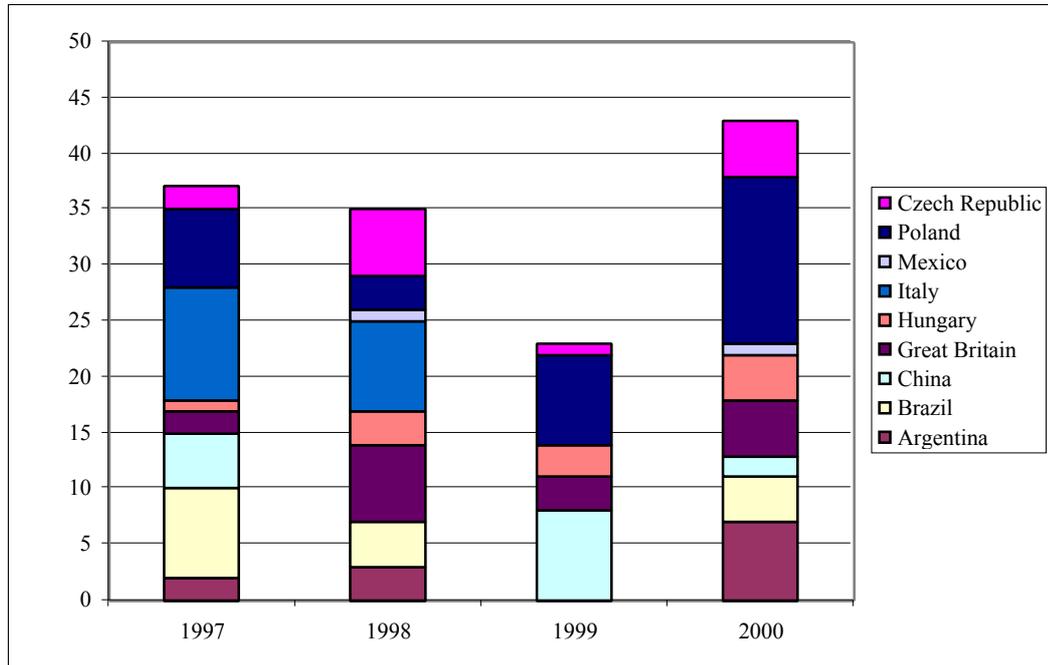
Source: FWO

Comparing Exhibit 1 with Exhibit 2 reveals that, in many cases, FWO has agreements with institutes in countries with which the federal and regional governments have intergovernmental agreements. This is especially the case for countries in Central and Eastern Europe and China. In addition, FWO has bilateral R&D agreements with organisations in countries where no equivalent intergovernmental agreement exists e.g. Japan, Taiwan, UK and the USA. In terms of the type of cooperative activity foreseen, the FWO bilateral agreements emphasise the exchange of researchers and joint research projects.

A somewhat different picture emerges from consideration of the patterns of researcher exchanges that occur within the ambit of scientific cooperation agreements between FNRS and its analogous funding bodies internationally. Exhibit 3 shows patterns of researcher movements within 18 inter-institutional agreements with national scientific bodies in nine countries. There is rather less geographical diversity to the FNRS list compared with the FWO list and the USA and Japan are conspicuous in their absence. We understand that this is the result of earlier institutional agreements (e.g. between FNRS and the National Science Foundation in the USA) not having been renewed rather than any active policy to restructure the mixture of bilateral agreements.

Exhibit 3 reveals that the numbers of all exchanges is low for FNRS (15-20 exchanges annually involving 30-40 researchers) and that there is a high degree of variability in numbers of researcher movements within this particular group of inter-institutional agreements, from one year to the next. This is a reflection of the policy rationale, which is to facilitate researcher-motivated international cooperation and mobility in areas of scientific interest (as judged by peer review). The average expenditure associated with this collection of inter-institutional agreements is around 3 million BEF a year. This subvention includes Belgium's French Community researchers travel expenses and the costs generated by foreign researchers staying in Belgium's French Community.

Exhibit 3 Patterns of researcher exchange, as part of the scientific co-operation agreements between FNRS and its ‘sister’ institutions⁴



Source: CREF, 2001⁵

2.4 Resources allocated to bilateral R&D cooperation⁶

In 1999, the federal government committed BEF 35 million through its combined bilateral agreements with Bulgaria, China, Poland and Russia. From these BEF 35 million, the federal government funded 20 projects, distributed as follows:

- 5 with Bulgaria;
- 6 with China;
- 3 with Poland;
- 6 with Russia.

The funding activities in the context of bilateral R&D agreements of the federal government are fairly stable. Each year, approximately 20 projects are approved for

⁴ The ‘y’ axis shows the number of researchers that have participated in the exchange programme. While the figures show individual researcher movements, in practice each ‘exchange involves a pair of researchers: a Belgian researcher taking a post abroad and his or her complement, a foreign researcher, visiting a university in Belgium’s French Community. The exchanges can take place over a period longer than one year in duration and therefore the matched pairs may be reported in the returns for two separate years.

⁵ CREF is the Council of Rectors of the universities of the French Community in Belgium; Le Conseil des Recteurs réunit les Recteurs des institutions universitaires de la Communauté française de Belgique

⁶ The figures include Belgian resources only. In general, however, the agreements conceive co-financing of cooperative ventures, but the host administration does not track and report on the resource expenditure of the foreign partner.

funding by the federal government.⁷ Similarly, the resources committed through the agreements remain pretty much the same. The number of projects selected is variable: 38 in 1996, 43 in 1997, 50 in 1998 and 41 in 1999.⁸ However, changes from one year to the next are intrinsic to the mode of funding. Each year project proposals can be submitted. The amount of funding granted to a project depends on the amount of money requested in the application.⁹ Hence, the number of projects that are selected depends on the number of applications and the amount of funding requested in each of them. It follows that the number of projects selected will vary somewhat from one year to the next. Therefore, with respect to the trend in resources committed through the bilateral R&D agreements it is better to look at the money allocated in the context of these agreements. By this token, the trend is stable, at least during the last three years.

The resources committed through the bilateral R&D agreements of the Flemish government increased from BEF 113 million to BEF 143 million in 1998. They have remained constant at BEF 143 million since then.

Exhibit 4 gives the resources committed through agreements of the Flemish government in the year 1999-2000 and the number of projects.

Not only does the Flemish government support more projects than the federal government (41 versus 20), the data suggest also that it allocates more resources to cooperation per project (at around double the average size). The 1999 data for project approvals and annual expenditure indicate that Flemish scientists were most active in joint ventures involving China and Poland. This finding suggests that Belgian scientists make rather more use of bilateral agreements sponsored by the regional governments compared with those of the federal government. This reflects the country's decentralised character and highlights the importance of a close relationship between the officials promoting a particular agreement and the prospective participants.

Exhibit 4 Flemish government annual expenditure and new projects approved for funding in 1999

Partner country	Resources in BEF million	Number of projects
Chile	21.4	7
China	34.5	10
Hungary	16.2	5
Poland	30.3	11
Romania	14.9	0
South Africa	24.4	8

Note: In 1999, no projects with Quebec were funded.

Source: Ministry of the Flemish Community, Science and Innovation Administration, Science Division

Annual expenditure by the French Community and Walloon government – for researcher exchanges and grants to support projects and work in foreign laboratories, is, on average, 12 million BEF. Exhibit 5, Exhibit 6 and Exhibit 7 show the geographical distribution and trends in different modes of cooperation, which reveals

⁷ Projects are funded for two years. Hence, about 40 projects are being funded at present.

⁸ For 2000, the number of projects selected is estimated to be 45.

⁹ With a maximum of funding by the Flemish government of BEF 4 million.

a move towards more intra-EU cooperation and a refocusing on researcher mobility and away from research projects.

Exhibit 5 Trend in the geographical distribution of French Community researcher visits (short stays, up to 50 days)

	1996-97	1997-98	1998-99	1999-2000	2000-2001
Africa	6	2	4	4	7
North America	40	31	50	43	46
South America	8	7	8	8	11
Asia	10	6	7	12	10
Australia	5	4	6	4	4
Europe outside EU	10	9	12	10	7
European Union	65	72	82	86	58
Total	144	131	169	167	143

Source: CREF, 2001

Exhibit 6 Trend in the distribution of French Community scientific visiting scholarships (minimum duration 3 months, maximum 2 years)

	1996-97	1997-98	1998-99	1999-2000	2000-2001
North America	8	4	6	8	
South America			1		1
Asia		2		2	
Australia	1		1		
Europe outside EU		4	3	1	2
European Union	3	2	5	8	4
TOTAL	12	12	16	19	7

Source: CREF, 2001

Exhibit 7 Trends in number of projects within the co-operation agreements between FNRS, CGI and the foreign government

	Number of projects selected					Average number of researchers per project
	1997	1998	1999	2000	2001	
France						
New projects	45	57	52	46	31	3
Renewals	46	45	39	36	34	3
<i>Total</i>	<i>91</i>	<i>102</i>	<i>91</i>	<i>82</i>	<i>65</i>	
Italy						
New projects	10		18		16	3
Renewals	6		0		6	2
<i>Total</i>	<i>16</i>		<i>18</i>		<i>22</i>	

Source: CREF, 2001

3 Denmark

3.1 Introduction

Ad hoc cooperation among researchers – or multilateral R&D schemes where formal programmes are concerned – are the preferred mode of international cooperation within the Danish public sector research system.

A small number of bilateral agreements do exist, but neither the Government nor the Danish Ministry of Research and Information Technology (MRIT) has a policy to promote the use of bilateral frameworks. Equally, the Ministry has no clear view of the volume or quality of cooperative work that the Research Councils have sponsored as a result of these agreements.

Bilateral agreements arise where an administration perceives that there is a need for such a framework. Organisations (e.g. Research Councils) will check with the relevant Ministry (MRIT or Foreign Affairs) for clarification if they are unsure about how to proceed with respect to an agreement. In the case of the Research Councils, however, the Research Forum (the governing body of the Danish Research Councils) will be informed of the proposals for collaboration, and will provide an assessment of the appropriateness of the venture and activities envisaged.

3.2 The Danish Ministry of Research and Information Technology

The Danish Ministry of Research and Information Technology (MRIT) has had a policy of decentralising the administration of the bilateral scientific programmes. Decision-making (both in terms of planning and funding activities) is part of the responsibility of the scientific institutions, councils, boards and organisations. The organisations have no ‘extra’ budget from MRIT to fund collaborative work. To date, the Danish Ministry of Research and Information Technology has signed four bilateral agreements

- Joint Declaration with Slovenia
- Joint Statement with Romania
- Joint Statement with Ukraine
- Memorandum of Understanding with Slovakia

These agreements do not contain any budgetary commitments and are open-ended in terms of the duration (no ‘end’ date is specified), and they are not directed at any one particular field of research.

3.3 The Danish Research Foundation

The Danish Research Foundation oversees the six Research Councils. The Foundation supports a limited volume of bilateral R&D cooperation outside the Councils and where this does occur it does so on an ad hoc basis through non-specific Cultural Agreements rather than within the context of dedicated bilateral

R&D agreements. Some will be known as Cultural Agreements others as Bilateral Agreements but the difference is a question of diplomacy, rather than the content of the agreement.

The one exception is a bilateral R&D agreement with Russia where the Danish Research Foundation has been involved alongside the individual national research councils and several other Danish ministries. This recently ratified agreement with St Petersburg, Russia is unique among Danish bilateral agreements generally in that it deals with a specific area of research and is embodied in a joint research *programme*. The Danish Research Councils set up the programme in negotiation with The State Committee of Ecology and Natural Resources in St. Petersburg. The Danish Ministry of Food, Agriculture and Fisheries and The Danish Environmental Protection Agency financed the programme, which covered:

- 1 Control of emissions of air pollutants
- 2 Monitoring and analyses of air pollution in St. Petersburg
- 3 The agricultural/environmental interface - benefits and risks associated with animal and human wastes

The agreement was designed to “promote research into environmental and energy problems and mutually beneficial scientific cooperation between Denmark and St. Petersburg”. A total of 6.78 MDK was granted to three 3-year joint-research projects within the three themes. The projects ran from January 1997 to January 2000. The programme was administered by an interdisciplinary steering group consisting of the chairmen of The Danish Natural Science Council, The Danish Agricultural and Veterinary Research Council, and The Danish Technical Research Council. In addition, the Steering Group included representatives from The Danish Ministry of Research and Information Technology, The Danish Ministry of Food Agriculture and Fisheries and The Danish Environmental Protection Agency

3.4 The Danish Natural Science Research Council

The Danish Natural Science Research Council has bilateral agreements with three countries:

- France
- UK
- Ukraine

The agreements with the UK and France are more than 13 years old and still operational. The parties concerned describe these agreements as “facts-of-life” – suggesting that they are not only longstanding frameworks, but that no-one really manages them or actively promotes their use. The agreement with Ukraine dates from 1994 and is administered by the Research Council as part of a wider ‘state to state’ agreement with the Danish Ministry of Research.

3.5 Danish Rectors Conference

The Danish Rectors Conference does not maintain any dedicated international bilateral R&D agreements. However, it is responsible for managing the Cultural Agreement Programmes which are designed to facilitate students studying abroad.

In a small proportion of cases, these cultural agreements do lead to foreign researchers visiting Denmark, with the partner country reciprocating for Danish researcher scholarships.

The scholarships are designed for advanced students, graduates and specialists to enable them to study or carry out research at a Danish university or a similar institution of higher education. Applicants must be nominated by their own authorities (i.e. their Ministry of Education or Ministry of Foreign Affairs). The budget for all programmes combined is around 7 MDK a year. The scholarship is meant to cover the living expenses of the applicant and, for researchers, amounts to a monthly allowance of 5,000 DKK.¹⁰ Each agreement states how many scholarship months are available for both parties. Research scholarships are usually granted for periods of 2-9 months. The final decision is conditional upon the arrangement of an appropriate study programme. Exhibit 8 tabulates those Danish cultural agreements that facilitate the exchange of researchers, experts and lecturers.

Exhibit 8 Distribution of awards by type for all bilateral Cultural Agreements (June 2000)

Country	Researcher scholarships	Experts	Guest lecturers
Austria	x	x	x
Belgium – Flemish Community	x	x	x
Bulgaria	x	x	x
China	x		x
Czech Republic	x	x	x
Egypt	x		x
Estonia	x		
Finland	x		
France	x		
Germany	x	x	x
Greece	x	x	x
Hungary	x	x	x
Iceland			
Israel	x		
Italy	x	x	x
Japan	x		
Latvia	x		
Lithuania	x		
Poland	x	x	x
Portugal	x	x	x
Romania	x	x	x
Russia	x	x	x
Slovak Republic	x	x	x
Spain	x	x	x
Switzerland	x		
The Netherlands	x		x
Turkey	x		
UK	x		

Source: Danish Rectors Conference

¹⁰ The income provided to visiting foreign scholars is tax free in Denmark providing the total stay does not exceed 365 days within a 2-year period. Scholarship holders are not allowed to enter into paid employment during their scholarship period in Denmark.

Exhibit 9 shows the number of months spent by foreign nationals in Denmark on Government Scholarships (by country) for the academic year 1999-2000, however the data include not only researcher ‘months’ but also students and language courses. Notwithstanding this, the table suggests that this mode of international cooperation is attractive to Denmark’s smaller neighbours and equally it is a favoured mode of cooperation between Danes and the Chinese, Polish and Japanese scholars.

Exhibit 9 Number of months spent by foreign nationals in Denmark on Government Scholarships for the academic year 1999-2000

Country	Months	Country	Months
Austria	18	Japan	60
Belgium	14	Letland	49
Bulgaria	22	Lithuania	44
China	150	Poland	101
Egypt	27	Portugal	21
Estland	41.5	Romania	30
Finland	18	Russia	47
France	51	Slovakia	16
Greenland	20	Spain	41
Holland	28	Switzerland	10
Hungary	35	Tjekkiet	34
Ireland	31.5	Tyskland	71
Israel	9	UK	10
Italy	73		

Source: Danish Rectors Conference

4 Germany

4.1 Introduction

Bilateral R&D agreements in Germany are associated with the general notion that research is a cornerstone on which to build good international relationships. In this respect, bilateral R&D agreements can be considered to be an instrument of the external policy of the Ministry of Foreign Affairs. Many of the most recent agreements have been made with the countries in Central and Eastern Europe and the Commonwealth of Independent States (CIS) are examples of this. As such, increased scientific cooperation with these countries has been made a priority in order to assist in preparing the ground for their integration into the EU and NATO.

Bilateral R&D agreements result from the more specific notion that international cooperation generates new impulses for the growth and improved performance of the German education and research system. Germany has numerous agreements in specific scientific areas. For example, the Bundesministerium für Bildung und Forschung, BMBF, (Ministry of Education and Science) has signed agreements in scientific areas that comply with its priority themes. These bilateral R&D agreements serve a more strategic purpose.

Notwithstanding the larger number of formal bilateral agreements, the weight of international R&D cooperation (in terms of policy and expenditure levels) in Germany is on cooperation within the EU framework.

4.2 Bilateral R&D agreements

In 1999, Germany had 216 bilateral intergovernmental R&D agreements, for the most part administered by one or other of the ministries of Education and Science, Agriculture, and Health. The 216 also include a proportion of agreements administered by the German research council, the Deutsche Forschungsgemeinschaft (DFG).¹¹ The 216 R&D agreements are a mixture of intergovernmental declarations, protocols and Memoranda of Understanding (MoU), yet legally binding agreements are by far the most common basis for cooperation.

In addition to agreements that are specifically aimed at R&D cooperation, Germany has many bilateral agreements of which the Ministry of Foreign Affairs is the principal signatory. Cultural Agreements do foresee the possibility of international cooperation in research, but this type of bilateral agreement is a vehicle chiefly for the Ministry of Foreign Affairs and the Ministry for Economic Co-operation and Development. R&D cooperation is not a goal per se. The Deutsche Akademische Austausch Dienst (DAAD) and the Alexander von Humboldt Foundation are independent intermediary organisations that administer bilateral cooperation

¹¹ The number of agreements would increase to 244 if we were to include bilateral R&D agreements signed by the Fraunhofer Gesellschaft, Deutschland, the Max-Planck-Gesellschaft and the Deutsche Agentur für Raumfahrtangelegenheiten GmbH.

programmes of this kind.¹² The DAAD implements exchange programmes for students, graduates, young academics, lecturers and professors. The Alexander von Humboldt Foundation grants research fellowships to both foreign and German researchers and administers programmes for research cooperation projects.

4.3 Geographical distribution of agreements

Those 200 plus agreements were with Ministries and Research Councils in 54 countries. Exhibit 10 shows the geographical distribution of the countries, while Exhibit 11 shows the countries grouped in terms of their economic development.

Exhibit 10 Bilateral agreements by geographic region

EU	Rest of Europe	Rest of World
• Austria	• Belarus	• Argentina
• Finland	• Bulgaria	• Australia
• France	• Croatia	• Brazil
• Greece	• Czech Republic	• Canada
• Ireland	• Former Yugoslavia	• Chile
• Italy	• Hungary	• China
• Netherlands	• Poland	• Costa Rica
• Norway	• Romania	• Egypt
• Portugal	• Slovak republic	• India
• Spain	• Slovenia	• Indonesia
• Sweden	• Switzerland	• Iran
• UK	• Russia	• Iraq
	• Ukraine	• Israel
	• Former USSR	• Japan
		• Republic of Korea
		• Kuwait
		• Morocco
		• Mexico
		• New Zealand
		• Pakistan
		• Philippines
		• Saudi Arabia
		• Singapore
		• South Africa
		• Taiwan
		• Thailand
		• Turkey
		• USA

Source: Compiled by Technopolis from various sources, written and oral

The geographical pattern of the bilateral agreements shows a diverse picture. Agreements have been concluded with countries all around the globe. Nevertheless, the EU and the rest of Europe are well covered. In terms of market maturity, the

¹² In the area of development cooperation, the Carl Duisberg Gesellschaft, GmbH administers programmes for education and training.

balance is toward emerging markets (and Latin American countries) as opposed to industrialised countries.

Exhibit 11 Bilateral agreements by market maturity

Industrialised	Emerging Markets	Emerging Markets
• Austria	• Argentina	• Mexico
• Australia	• Belarus	• Pakistan
• Canada	• Brazil	• Philippines
• Finland	• Bulgaria	• Poland
• France	• Chile	• Romania
• Greece	• China	• Russia
• Ireland	• Costa Rica	• Saudi Arabia
• Israel	• Croatia	• Singapore
• Italy	• Czech Republic	• Slovak Republic
• Japan	• Egypt	• Slovenia
• Netherlands	• Former Yugoslavia	• South Africa
• New Zealand	• Hungary	• Thailand
• Norway	• India	• Turkey
• Portugal	• Indonesia	• Ukraine
• Spain	• Iran	• Former USSR
• Sweden	• Iraq	• Venezuela
• Switzerland	• Republic of Korea	
• UK	• Kuwait	
• USA	• Morocco	

Source: Compiled by Technopolis from various sources, written and oral

4.4 Resources allocated to bilateral R&D cooperation

The programmes of the Bundesministerium für Bildung und Forschung (BMBF) are managed by intermediary organisations. The International Bureau (IB) of the Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR) manages the programmes for bilateral cooperation with:

- the countries in Europe,
- Asia,
- CIS,
- Australia,
- New Zealand,
- Canada,
- the US,
- countries in Latin America.

The IB of the Research Centre Jülich manages the programmes for bilateral cooperation with:

- Africa, especially Egypt, South Africa, Tunisia and Morocco
- Israel
- Turkey

- The Arab countries.

The DLR budget is restricted to mobility costs; it was DM 13.7 million in 1998. We understand that the total R&D effort pursued through bilateral agreements is higher with the major budget items (for personnel, infrastructure, etc.) being financed by special sections of the BMBF. The responsibility for core funding of bilateral R&D cooperation in scientific priority areas of the BMBF is assumed by project management organisations. The areas of priority are:

- Research of environment and climate
- Geoscience
- Material research
- Biotechnology
- Medicine
- Information technology
- Regenerative energy systems and rational use of energy application
- Recycling and lasting application of raw materials
- Basic research

The project management organisations are generally located in private research institutes. For instance, the organisations responsible for New Materials and Chemical Technologies (NMT), Energy, Technology, Sustainability (ETN) and Biotechnology, Energy, Environment of the BMBF and the BMWI (BEO) are located in the Jülich Research Centre, while the Karlsruhe Research Centre accommodates the project management organisation, Water Technology (WT).

Bilateral R&D schemes are administered in a range of different project management organisations. For example, funding of cooperation with Israel involves 6 different project management organisations. This is true for all countries. Consequently, it is difficult to get a full view of the resources committed through the agreements, the number of projects and the number of researchers and scientists involved at the country level. Nevertheless, we have data for cooperation between Germany on the one hand and Israel and China on the other, in the area of materials research (the NMT - MaTech programme). They are presented in Exhibit 12.

Exhibit 12 Expenditure data for the MaTech Programme, 1999

	China	Israel
Expenditure last year	DM 1.3 million	DM 5 million
Number of projects	4	3
Trend	Constant	Constant

Source: The International Bureau (IB) of the Deutsches Zentrum für Luft- und Raumfahrt
 The figures for expenditure are just for cooperation in materials research. If these are typical, the total figure for bilateral R&D cooperation is likely to be closer to DM 100 million rather than DM 15 million.

Cooperation with EU Member States takes place mainly within the multilateral context of the EU Framework Programmes, EUREKA and COST. Extensive bilateral relations at the central level are currently maintained with just a few selective EU countries, i.e. Greece, Spain and Portugal.

4.5 Cooperation and scientific disciplines

BMBF supports joint research projects. The programmes of the IB at the DLR as well as the IB at the Research Centre Jülich do not just intend to promote bilateral cooperation between universities and research organisations, but also seek to involve industry, in particular - small and medium-sized enterprises. For instance, the participation of SMEs in n+n projects is desired. Through this BMBF seeks to stimulate application-oriented research. It is expected that industry participants match the government financial support.

Financial support focuses on the costs relating to exchange of researchers in the context of joint research projects and international workshops etc. Each partner country more or less funds an equal part of the costs relating to travel and dwelling. In this respect, the sending organisation will cover the return travel costs from its country to the first host institute, while an adequate living allowance will be provided by the organisation of the host country. In some special cases an exception will be made to make non-cash contributions available (for the foreign partner).¹³

Applications for funding can be submitted with IB at DLR and the IB at the Research Centre Jülich at any time. There are special calls in the case of certain priority themes only. In 1998, the IB:

- supported 1,233 bilateral research projects with mobility funding
- assisted the BMBF in organising and carrying out 18 committee meetings (mixed committees, working groups and steering committees) in the context of bilateral agreements for scientific-technological cooperation
- and in organising and carrying out 20 visits by national and international government or expert delegations
- supported numerous workshops and seminars (Internationales Büro des Bundesministeriums für Bildung und Forschung, 1998)

The scientific disciplines of R&D cooperation vary from one partner country to another. As mentioned in section 4.1, the agreements envisage cooperation to be to the mutual benefit of both Germany and its partners. The programmes of the BMBF focus on themes that have strategic importance for the ministry. These include new technologies (e.g. nanotechnology, super conductors, chemical technologies, new materials and laser technology), information and communication technology, transport and space craft, environmental research, fundamental physics, and biotechnology and health research.

The programmes of the DFG and the corresponding partner organisations conceive funding of:

1. Exploratory, consultative and research visits
2. Joint seminars
3. Joint research projects

¹³ www.kfa-juelich.de/ib/ib-e/bedingungen-e.htm

For the first two of the above categories, financial support is restricted to travel and living expenses. The sending organisation will cover the return travel costs from its country to the first host institute, while an adequate living allowance will be provided by the organisation of the host country. Joint research projects can be supported utilising the normal funding options applicable to the respective programmes of the DFG and the respective partner organisation.¹⁴ In this case, DFG sponsors the German participant(s), and vice versa. Nevertheless DFG assumes support of the foreign participant(s) too, when funding from foreign sources cannot reasonably be expected. Funding covers expenses relating to personnel, scientific equipment and components, and travel.

Applications for financial support can be submitted to the DFG the whole year round. There are special calls in the case of certain priority themes only.

¹⁴ DFG Programme and Application Requirements (www.dfg.de/english/coop/prog_appl_requ).

5 Greece

5.1 Introduction

A dedicated unit within GSRT – the Directorate for international scientific and technological cooperation – manages all activities pertaining to international scientific cooperation between Greece and other countries. Specifically, it:

- draws up bilateral and multilateral intergovernmental agreements for scientific and technological collaborations and ensures proper fulfilment of all undertakings and the diffusion of all relevant information

5.2 Bilateral agreements

GSRT's Bilateral Cooperation Programme encourages Greek scientific & industrial institutions to develop research collaboration with relevant ministries and administrations in the member states of the European Union, countries of Central & Eastern Europe, countries of the Former Soviet Union as well as with Industrialised and Developing non-European Countries. The programme objectives are:

- the broadening of basic scientific knowledge as well as the opening and transferring of existing knowledge to industry
- the transfer of technological know-how to and from Greece
- the development of international R&D networks

A requirement for the commencement of a Bilateral R&D Cooperation Programme is the signature and ratification by the Parliament of an umbrella agreement that foresees the need to cooperate on R&D issues. Such umbrella agreements might refer to Economic, Industrial or Educational cooperation as well as scientific. The bilateral cooperation projects are implemented through:

- exchange of experts aiming towards the joint investigation of scientific research subjects as well as to the development of joint research projects
- joint research & development projects by the research teams of both countries

In addition to implementing the protocols, GSRT's programme provides financial support for bilateral cooperation projects. The financial support given to each bilateral cooperation project is rather low – normally less than 15,000 Euro – and covers: travel expenses for visits to the partner countries; cost of consumables; small equipment items; publication costs. In some cases, GSRT provides small grants or stipends to young researchers from the partner country where they wish to work for a few months in the Greek institution. For a small proportion of bilateral projects, which fulfil certain requirements, such as the participation of industry, financial support might reach the amount of 30,000 Euro per project.

Greece currently has 19 bilateral cooperation agreements, though only 18 of these agreements are 'active.'¹⁵ Exhibit 13 lists agreements that were active in 2000, by geographical area.

Exhibit 13 Greek bilateral S&T agreements, by geographical area (

Geographical area	Partner country
EU Member States	France
	UK
	Hungary
	Spain
	Italy
	Germany
Other European	Bulgaria
	Cyprus
	Slovakia
	Czech
	Armenia
	Romania
	Albania
	Yugoslavia
	Slovenia
	Russia
	Georgia
Rest of the World	China

Source: GSRT, 2000

In 1999, 132 new bilateral projects were approved with a total budget of 1.95 million Euro. The application to acceptance ratio for project proposals under the bilateral cooperation programme varies from year to year and from country to country, but averages around 2.5:1 (40% of proposals are supported).

Exhibit 14 shows the number of bilateral cooperation projects that were active in any one year during the six-year period to 1999. The number of bilateral projects is growing but slowly at around 8% overall in the six-year period. Europe dominates the list of current bilateral agreements. Germany, Italy and France dominate within the EU. The number of projects within any one agreement tends to fluctuate, but the geographical trend revealed is that while intra-EU cooperation is broadly stable there has been growth in cooperation with Central and Eastern Europe and Russia. Cyprus is the one country where there has been a strong reduction in the level of cooperation, in this case from 36 projects in 1996 and 1997 to no project since.

¹⁵ A bilateral agreement exists between Greece and Israel but it is currently described as dormant.

Exhibit 14 Trend in the number of Greek bilateral cooperation projects, by partner country

Current Projects	1994	1995	1996	1997	1998	1999
France	0	30	28	30	30	22
UK	0	13	9	12	10	8
China	0	0	20	20	22	22
Bulgaria	0	0	25	25	14	14
Cyprus	0	0	36	36	0	0
Slovakia	10	10	14	14	15	15
Czech	12	12	17	17	0	27
Hungary	14	14	0	28	28	26
Armenia	0	0	6	6	0	0
Spain	19	19	0	26	26	0
Italy	30	30	0	22	22	42
Germany	34	34	0	35	35	38
Romania	38	38	0	0	26	26
Albania	12	12	0	0	0	4
Yugoslavia	0	0	0	0	16	16
Slovenia	0	0	0	0	22	22
Russia	0	0	0	0	0	18
Georgia	0	0	0	0	0	21
Total	2163	2207	2151	2268	2264	2320

Source: GSRT, 2000

6 Spain

6.1 Introduction

In the recent past, Spain has sought to strengthen its position in the international S&T panorama and, inter alia, increased the number of bilateral cooperation agreements. Research – and international cooperation – received a major boost with the publication of the five-year national plan in 2000.

In Spain, as in Italy, there are two levels of agreements, the government agreements signed by the Ministry of Foreign Affairs represent the framework within which the Institutions can then develop their own schemes. The General Sub-directorate of International Scientific Relations is responsible for these agreements and it organises a "Mixed Commission" that decides what projects will be funded by the Ministry.

In Spain, bilateral R&D agreements are administered by the Higher Scientific Research Councils (CSIC) and three national public research institutes, each with a particular topical focus and Ministerial remit.

Organisation	Acronym	Ministry
Consejo Superior de Investigaciones Científica (<i>Higher Scientific Research Council</i>)	CSIC	Culture and Education
Instituto Nacional de Técnica Aeroespacial (<i>National Institute of Aerospace Technology</i>)	INTA	Defence
Instituto Nacional de Tecnología Agraria and Alimentaria (<i>National Institute of Food and Agriculture Technology</i>)	INIA	Agriculture, fishing and food
Centro de Estudios y experimentación de obras públicas (<i>Centre of studies and experimentation on public works</i>)	CEDEX	Public Works and environment

6.2 Consejo Superior de Investigaciones Científica (CSIC)

Among the four Research Councils, CSIC maintains the largest number of bilateral R&D agreements. Scientific and technological activity is international. CSIC maintains contact with research councils abroad and with international scientific institutions. This is demonstrated by the agreements and understandings that the CSIC has with scientific institutions in various countries for the following purposes:

- Exchange of researchers
- Cooperation in international R&D projects
- Training of research staff

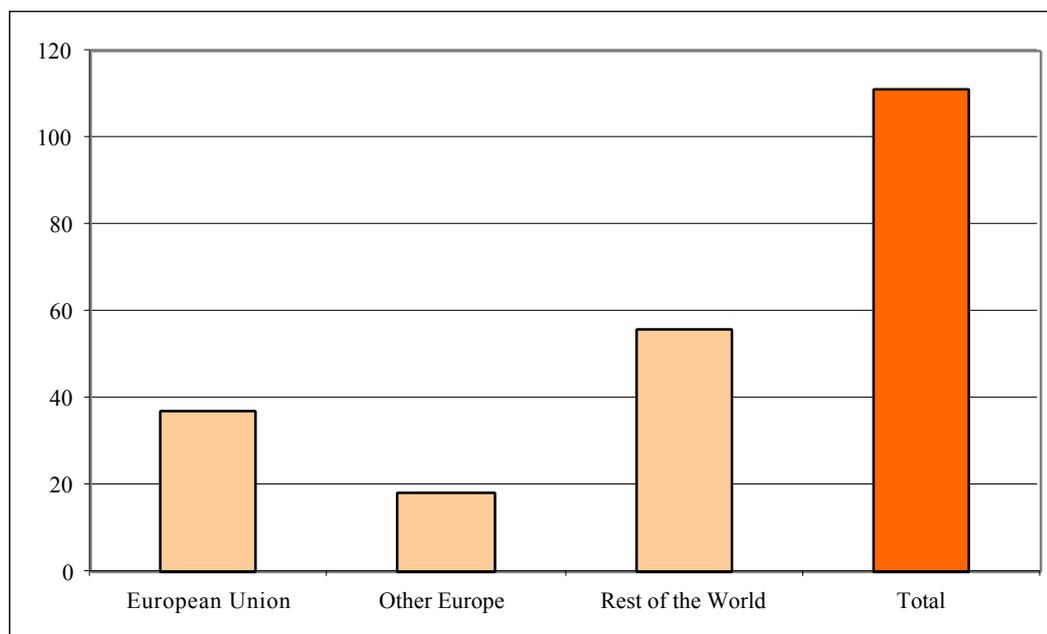
The CSIC collaborates with the Government institutions responsible for international scientific cooperation (Foreign Ministry, Inter-Ministerial Commission for Science and Technology, etc.) and participates in their programmes.

The CSIC's sub-directorate, the General Directorate for International Relations, deals with agreements and projects and reports on opportunities for funding of international cooperation projects, training scholarships and stays abroad.

6.3 Bilateral Agreements

Exhibit 15 shows the geographical distribution of the 100 intergovernmental bilateral R&D agreements, which we recorded in Spain. Those agreements involve 39 partner countries, 10 of which are within the EU, 10 Other European Countries and 19 agreements are with non-European countries.

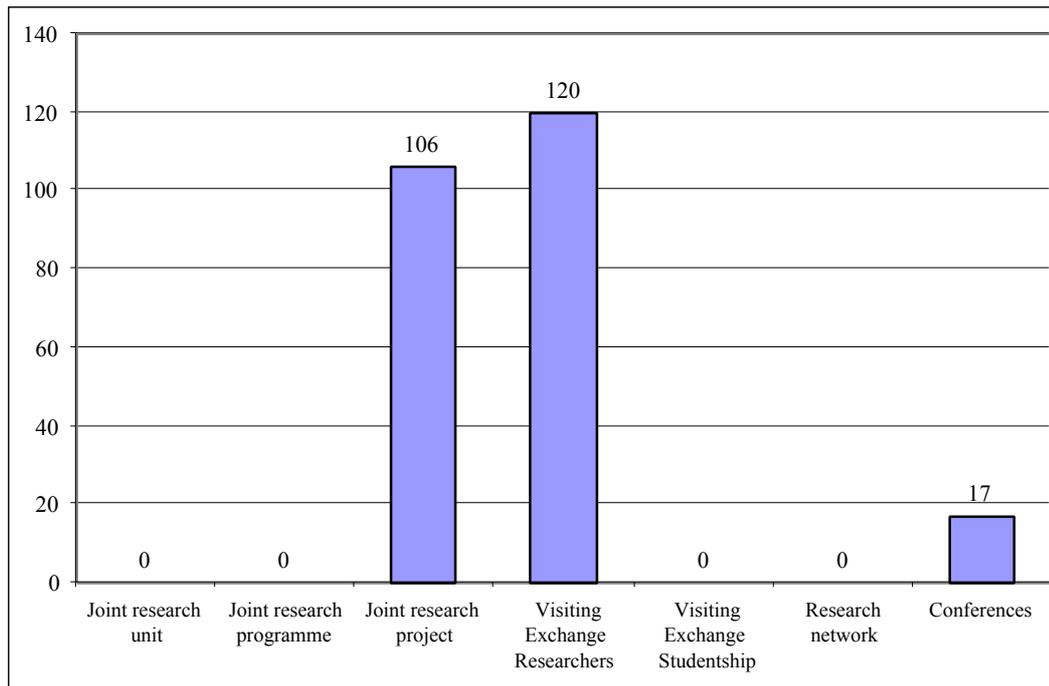
Exhibit 15 Distribution of Spanish bilateral R&D agreements by geographic region, by number of agreements current in 2000



Source. Technopolis, compiled from various official sources

The majority of the Bilateral Agreements fund the exchange of researchers; however the cooperation between Institutions is carried out through "common research projects" and the organisation of conferences and seminars.

Exhibit 16 Dominant mode of international cooperation for Spanish bilateral R&D agreements current in 2000 (number of agreements)



Source. Technopolis, compiled from various official sources

Projects that arise under the various Bilateral Agreements are not tracked systematically by the sponsoring organisations. As such, CSIC, for example, has no disaggregated data on expenditure or numbers of participating researchers. Rather, the budget associated with these bilateral agreements falls into the general category, "International Activities". More than the 77% of the agreements are based on open themes. The rest, 25 out of 110 agreements, are based on specific themes agreed by the two countries. They spread from Maritime Science and Engineering to Space Science. These specific themes are defined on the basis of the Institutions characteristics and carried out by both of the Institutions, or strategic plans on government's level. A 'Memorandum of Understanding' is the most common legal basis of agreements in Spain, with 85 of the 110 agreements having a MoU. This emphasis is explained with the fact that a MoU is, generally speaking, a more flexible means to facilitate cooperation between two parties; it permits an "open" framework of collaboration.

7 France

7.1 Introduction

On the national level, the Ministry of Foreign Affairs is in charge of *all* kinds of bilateral agreements; in the case of research agreements there is strong cooperation with the Ministry of Research. A particular feature of the French research system is the central role played by research institutes (*OPR, organismes publics de recherche*) in both policy and operational terms. They are signatories to bilateral agreements and they are the main French partners for any research cooperation.

In the last decade the national institutes have become increasingly mingled with university laboratories,¹⁶ which makes the identification of financial resources for co-operative schemes impracticable. The task of counting this activity has been made all the more difficult by a decision three years ago – a result of an acknowledgement that all research has an international dimension – to remove ‘international activity’ from the list of budget items presented in research contracts.

7.2 The Ministry for Foreign Affairs

Bilateral programmes are the prime responsibility of the Ministry of Foreign Affairs (MAE, ministère des affaires étrangères) in cooperation with the Ministry of Research (MENRT, ministère de l’éducation nationale, de la recherche et de la technologie). There exists an association in connection with the ministry, which is in charge of accompanying several programmes of personal mobility and cooperation in the field of knowledge exchange. It is now managing the call for tenders and the bilateral programmes. The EGIDE homepage is the main platform of information concerning the bilateral research.¹⁷

Within the Ministry of Foreign Affairs, it is the Directorate of scientific and Technological Cooperation that is responsible for bilateral agreements. It is divided in four geographical sub-directorates and three sub-directorates according to specific subjects:

- Industrialised countries
- Developing countries
- Maghreb
- Central- Eastern Europe
- Scientific and technological support
- Social, human and archaeological sciences
- Administrative cooperation and non-governmental cooperation.

¹⁶ The so-called mixed laboratories are based on a four-year contract of the research organisation, the state and the university involved. 80% of CNRS laboratories are mixed laboratories with different budgetary resources.

¹⁷ <http://www.egide.asso.fr/pai>

The policy differs according to the different regions. Firstly, with EU-member countries and EU-candidates, bilateral cooperation is maintained, but with the aim of attaching them to multilateral programmes¹⁸. Second, with the other big industrialised countries, everything is bilateral. Third, with emerging countries, some links are multilateral¹⁹. Fourth, with countries of the so-called priority zone of solidarity (ZSP)²⁰, there is a strong articulation between bilateral and multilateral schemes. Moreover, cooperation schemes with ZSP cover both the financing of mobility and other things like equipment, whereas with the rest of the world, only mobility is financed by bilateral contracts of the ministries.

7.3 The Ministry for Education, Research and Technology (MENRT)

In the framework of bilateral agreements, the MENRT is assisting the MAE as “technical ministry” with the latter signing all agreements. The Ministry of Research has a stimulating role, it finances and co-finances a certain number of programmes, for instance some of the PAI. It has a minor part in the financing of bilateral agreements. Its contribution to bilateral research policy is important in terms of its competence: most project evaluation is done under the lead of the Ministry of Research.

Within the Ministry of Research, one sub-direction of the delegation of international relations and cooperation (DRIC) is concerned with bilateral interventions. It is organised in geographical units (America, Africa and Middle East, Eastern-Central Europe, and Asia-Oceania). Besides that, the three main departments of the Ministry – Education, Research and Technology – have each their office for international relations. With the arrival of former Minister Allègre in 1997, a specific international R&D policy was introduced. The orientation of the DRIC according to its role as an interface between the MAE and the MERNT is still aligned to the MAE. For the international offices in the technology- and research departments, priorities have been defined, both on a regional and on a thematic level:

- The priority of priorities is Europe
- In second order, the following countries have been chosen: China, India, Brazil and Mexico
- The Department of Technology added Japan, USA and Israel
- The Department for Research added South-Africa

According to representatives of the department for technology, thematic priorities are crossed with regional priorities, for instance the special strength of France in waste treatment is developed further in chosen countries. Similarly, the excellence of Indian researchers in the field of software is recognised and France aims to offer complementary knowledge like tele-teaching. The focus of the unit for international

¹⁸ This aim to become multilateral can be present from the beginning.

¹⁹ On the level of research organisations, and of international organisations like the World Bank, there is much preoccupation with emerging countries.

²⁰ The ZSP, zone de solidarité prioritaire, has been defined in course of a reorientation of the French foreign policy with developing countries in 1998. Mainly, it has widened the circle of countries subject to this cooperation policy, including countries that have not been French colonies before. The list of countries is available under <http://www.diplomatie.fr/cooperation/zsp/zsp00.html>

affairs in the department for technology (created in 1997) is to find best practice in European countries and to enter a concrete partnership in the innovation policy.

Priorities in international cooperation are aligned to European priorities on the one hand and on the other hand to French priorities defined by the Inter-ministerial Committee of scientific research and technology (CIRST) for 1999/2000.²¹ For the first time, a priority is given to life sciences. A second priority is given to new information and communication technologies, whereby more means are dedicated to human and social sciences, a further priority is given to energy (nuclear energy and renewable energy) and transport (supersonic), finally, special weight is given to sciences of earth and space.

7.3.1 Bilateral Programmes concluded by the two Ministries

The following types of bilateral agreements exist:

- Intergovernmental agreements
 - Cultural agreements (most general)
 - Educational, scientific and technical agreements
 - Agreements in specific fields like agriculture, that can include an R&D part
- Other bilateral agreements
 - Inter-university agreements
 - Agreements of the laboratories
 - Agreements of research organisations

7.3.2 Intergovernmental agreements

Bilateral programmes are designed together with the partners in the several countries and financed on a matched funding basis by the two countries involved. They are constituted by projects which pass an evaluation by each of the countries and which are then selected jointly. The call for tenders is published every year. It is distributed to the services for international relations in universities, research centres and institutes and the *Grandes Ecoles*. Projects are supported for two or three years. If there is a strong educational component, they can last four years or more.

A certain group of inter-European bilateral programmes which are concluded on the ministerial level are called “*programmes d’actions intégrées*”(PAI – Integrated activities’ programme). These programmes are jointly proposed by a French team and a team from another country, and jointly supported by the corresponding public authorities. Public and private research institutes are eligible for PAI. The financial aid is supposed to finance the “international cost increment”, like transport or stay. Salaries and investment are excluded. PAI mainly concern short-term mobility (less than a month), and they are generally granted for a maximum of two years²², although some programmes allow for a third year.

Exhibit 17 lists the bilateral PAI-programmes that have been concluded for the years 2000 and 2001.

²¹ <http://www.education.gouv.fr/discours/1999/cacirst2.htm>

²² The programme AURORA with only one year is an exception.

Exhibit 17 List of integrated activities' programmes (PAI)

	Partner Country	Partner Administration
Alliance	UK	British Council
Amadeus	Austria	Büro für Wissenschaftlich-Technische Zusammenarbeit des ÖAD (Österreichischer Austauschdienst), tel: 0043-1-533 24 55
Aurora	Norway	Norges Forskningsraad (NFR), Mme. Hilda Stroem Martinsen, +47 22 03 70 01
Balaton	Hungary	OMFB – Ministère de l'Education, Tel: +36 1 317 06 77
Barrande	Czech Republic	Accord cadre signé en 1992. Association of Innovative Entrepreneurship of the Czech Republic (AIE CR), +420 2 21 08 22 76 Ministry of Education, Youth and Sports. tel: +420 2 571 93 718
Galilée	Italy	The Italian Rectors Conference (CRUI) tel: +3906 85 85 65 81
Picasso	Spain	Ministerio de Education y Cultura, Subdireccion General de Formacion, Perfeccionamiento y Movilidad de Investigadores, tel: +34 91 550 54 65
Platon	Greece	General Secretary for Research and Technology, Directorate for International Co-operation Tel: 30 1 69 11 122
Plonium	Poland	Komitet Badan Naukowych (KBN), National committee for Scientific Research +48 22 628 35 34
Procopé	Germany	DAAD, Deutscher Akademischer Austauschdienst +49 228 882 251
Proteus	Slovenia	Ministry for Science and Technology tel: +386 61 178 47 21
Tournesol	Flemish community in Belgium	Ministerie Van de Vlaamse Gemeenschap, Mme Serlippens +32 2 553 98 23
Tournesol	French community in Belgium	Commissariat général aux relations internationales (CGRI), M. Jadoul +32 2 421 83 19
Van Gogh	Netherlands	Nederlandse Organisatie voor Wetenschappelijk (NWO) Mme JA Consolni-Pollen Tel: 070 344 06 30

Source: The Ministry for Education, Research and Technology (MENRT), 2000

French researchers, notably the project responsible, have to take the necessary steps in order to protect the French scientific, technical and industrial patrimony and their intellectual property. They should care that the project does not lead to technology transfer to other countries that would be inappropriate or detrimental.

Quantitative information on bilateral schemes is not available. The only programme-line for which this information is available are the PAI, the most classical programme of funding of short and medium term mobility of researchers. The financial means for bilateral programmes vary between a mean of 20 000 FF for PAI in Europe and 400,000 FF, for example, for CEFIPRA projects with India

Exhibit 18 The PAI projects accepted for the year 2000

	Number	Financing of MAE (FF)	Financing of MENRT (FF)
Alliance with the UK	100	800 000	453 000
Amadeus with Austria	33	480 000	
Aurora with Norway	17	330 000	
Balaton with Hungary	55	900 000	
Barande with the Czech Republic	62	775 000	
Galilée with Italy	57	700 000	83 000
Picasso with Spain	133	915 000	525 500
Platon with Greece	49	550 000	212 900
Plonium with Poland	129	2 200 000	
Procope with Germany	158	2 700 000	445 200
Proteus with Slovenia	35	395 000	
Tournesol with the Flemish community in Belgium	22	124 000	
Tournesol with the French community in Belgium	33	160 000	
Van Gogh with the Netherlands	15	310 000	93 000
<i>Total</i>	<i>898</i>	<i>11 339 000</i>	<i>1 812 600</i>

Source: The Ministry for Education, Research and Technology (MENRT), 2000

Besides the PAI, Exhibit 19 shows three other bilateral agreements with European countries are signed in a similar way and have a similar role. As for the PAI, EGIDE serves as an interface between the Ministry and researchers.

Exhibit 19 Non-PAI bilateral research programmes

	Partner Country	Contact in France
Programme de Recherche Industrielle (PRI) – Fondation Franco-Norvégienne	Norway	Fondation Fraco-Norvégienne, Insitut Français du Pétrole M. Leprince Tél: 01 47 52 60 00
Programme de Coopération Scientifique et Technique (with the ICCTI, Institut de Coopération Scientifique internationale)	Portugal	Ambassade de France, Service Culutrel, Scientifique et de Coopération, Lisbonne +351 1 311 14 42 scientec@individual.Eunet.pt
Prgramme de Coopération Scientifique et Technique MAE/CNRS - FORBAIRT	Irlande	CNRS Direction des Relations Internationales Mme Hélène Bakhoum 01 44 96 30 http://www.cnrs.fr/Actualites/International/index.html

Source: The Ministry for Education, Research and Technology (MENRT), 2000

7.3.3 Bilateral programmes with non-European countries

Latin America: the ECOS committee

Bilateral cooperation with six Latin-American countries (Argentina, Brazil, Chile, Columbia, Mexico, Uruguay and Venezuela) is structured by the so-called “Comité ECOS”(Evaluation – Orientation de la Coopération Scientifique²³). In total, there are: around 250 multi-annual projects running, which have the aim of strengthening doctoral formation; 550 movements of researcher/teachers are counted (300 French and 250 Latin Americans), and more than 1000 scholarships for Latin American doctoral students going to France. France holds the second rank after the US as a

²³ <http://www.ecos.univ-paris5.fr>

host country for Latin-American doctoral or post-doctoral students, and the first rank in the case of Brazil (500 students). The financial contribution of the MAE amounts to about FF 10 million a year.

United States: The France-Berkeley Foundation (FFB)

The FFB was created in May 1993 aiming at increasing French presence in the best American universities, with a total donation of 10 million FF, financed by the French government and the University of California at Berkeley. In 1996, 2,3 million Francs were added; another subsidy of 300 000 FF was added in 1997 when the geographical coverage was increased to Los Angeles. In 1999 UC Davis and UC Santa Cruz joined the foundation. It is open to all disciplines and is managed jointly by French and US-partners. In average, 10 000 \$ are paid per project, this means that around 15 projects can be funded per year. The French government has the objective to widen the cooperation to several other universities²⁴.

The funds of the MAE for activities in regions of the priority zone of solidarity amounts to 100 million FF per year. This fund is the major source for any activities in this area, R&D or other development aid. In these regions, the Ministry works in close relationship with two major research institutes, the IRD and the CIRAD .

Lavoisier Scholarships

This programme allows French doctoral students in human and social sciences, as well as young French researchers in all disciplines to spend a year in a foreign country. In 1999, 370 such scholarships were supported and the budget for the year 2000 amounts to 23,6 million FF. The MAE also finances scholarships for foreign researchers with a total envelope of 555MF per year. With 23 000 scholarships funded in 2000, the number rose considerably since 1999. The most important region for this kind of cooperation by far is Northern Africa Sub-Saharan Africa (see Exhibit 20).

Exhibit 20 Regional distribution of MAE scholarships for foreigners

North Africa	6 833	30,04%
Sub-Saharan Africa	5 271	23,17%
Central-Eastern Europe	3 885	17,08%
Middle-East	1 872	8,23%
South- and South-East-Asia	1 590	6,99%
Eastern Europe	1 319	5,80%
Farther East and Pacific	86	3,82%
Central America and Southamerica	809	3,56%
North America	299	1,31%
<i>total</i>	<i>21 964</i>	<i>100,00%</i>

²⁴ University of California at Davis, Santa Cruz, San Francisco, Los Angeles, Riverside, Santa Barbara, Irvine, San Diego and 3 national laboratories : Lawrence Livermore, Lawrence Berkeley, Los Alamos.

7.4 Other Ministries

All large specialised research institutes are under the umbrella of the ministry for research, the Ministry for Finance and also the involved Technical Ministries. Therefore, most Ministries are in some way involved in research funding. It goes beyond the framework of this study to go into detail within all the other ministries. In any case, whatever general agreement has been signed, the Ministry of Foreign Affairs has to be involved. Moreover, the technical Ministries are mainly involved into research through their responsibility over research organisations. We therefore decided to give a priority to contacting the latter.

The French government has created **bilateral research associations** with six countries: Germany, Finland, Sweden, Norway, Israel, and Italy. These associations primarily have the role of supporting researchers and industry with a network of contacts. They co-operate closely with French embassies in the countries concerned.

7.5 CNRS

The CNRS has bilateral agreements with 49 countries. These agreements are managed by the Department for International Relations (DRI, *Direction des relations internationales*). They allow researchers (French or foreign) to stay in a research institute of the partner country. Foreign researchers are selected by partner institution and then approved by the CNRS. French researchers can participate in these programmes if they either work in a CNRS laboratory or in a higher education institution with a research unit associated to the CNRS.

According to the director of the International Affairs Directorate, the international policy of the CNRS is guided along the lines of:

- The general increase of internationalisation of research
- The strong economic component of the actual globalisation
- The international character of the “market for grey matter”

A main objective is to make the international policy of the CNRS as coherent as possible, given the fact, that cooperation mostly takes place on the level and the initiative of individual researchers and laboratories. Beyond the cited framework agreements, other bilateral ways of collaboration are used:

- The creation of European Associated Laboratories (20 such LEA exist today)
- The establishment of CNRS laboratories abroad in other fields than the classical ones like archaeology. Three such laboratories have been created recently:
 - DALIEN, a laboratory in China, together with the Chinese Academy of Sciences and ELF, focusing on petrol studies
 - In Singapore, a joint laboratory with the national university of Singapore has been created in the field of new information and communication technologies
 - In Chile, a laboratory for mathematics has been created with the university of Chile. Industry is associated to this laboratory through a “club of industrials”.

The US policy of establishing antennas in several countries (like GeorgiaTech in Metz in France or the John Hopkins University in Bologna) is an example for the research policy of the CNRS.

Exhibit 21 List of the CNRS' bilateral agreements

Algeria	Directorate of Scientific Research (DRS) of the Ministry for Higher Education and Research (1)
Argentina	National council of scientific and technical research (CONICET) (1)
Austria	Oesterreichische Akademie des Wissenschaften (OAW) (2)
Belgium	Commissariat Général des Relations Internationales de la Communauté Française (CGRI)/Fonds National de la Recherche Scientifique (FNRS) (1)
Belgium	Ministry of the Flemish Community (MCF) (1)
Brazil	National Council of Scientific and Technological Development (CNPq) (1)
Bulgaria	Bulgarian Academy of Science (BAS) (1)
Canada	National Research Council of Canada (CNRC) ; Council of Medical Research (CRM) (1)
Chile	National Commission of Scientific Research and Technology (CONICYT) (1)
China	Academy of Sciences (AS), National Foundation of Natural Sciences of China (NSFC), Academy of Social Sciences of China (ASSC), KC Wong Education Foundation (1)
Cuba	Ministerio de Ciencia, Tecnológica y Medio Ambiente (CITMA) (1)
Czech Rep.	Academy of Science of the Czech Republic (1)
Denmark	Danish National Science Research Council (SFN) (2)
Egypt	Academy of Scientific Research and Technology (ARST) (1)
Finland	Academy of Science (AS) (2)
Germany	Deutsche Forschung Gemeinschaft - DFG (3), Hermann von Helmholtz Gemeinschaft Deustcher Forschungszentren - HGF (3), Max-Planck-Gesellschaft - MPG (3) (2)
Greece	The National Hellenic Research Foundation (NHRF) (2)
Hungary	Academy of Science (MTA) (2)
India	Council of Scientific and Industrial Research (CSIR) (1)
Ireland	FORBAIRT/MAE (French Embassy in Dublin) (FORBAIRT) (1)
Israel	Ministry of Sciences and Arts (MOSA) (2)
Italy	Consiglio Nazionale delle Ricerche (CNR) (1)
Japan	Japan Society for the Promotion of Science (JSPS) (1); Agency for Industrial Science and Technology (AIST / MITI) (2); Science and Technology Agency (STA) (2); Ministry of Education, Science and Culture (Monbusho) (2)
Kazakhstan	Academy of Science of Kazakhstan (1)
Lebanon	National Council of Scientific Research of the Lebanon (CNRSL) (1)
Madagascar	Ministry of applied research for development (MDRAD) (1)
Morocco	National Centre for Coordination and Planification of Scientific and Technical Research (CNCPRST) (1)
Mexico	National Council for Science and Technology (CONACYT) (1)
Netherlands	Netherlands Organisation for Scientific Research (NWO)
Norway	The Research Council of Norway (Norges Forskringsrad, NFR) (2)
Oman	Sultan Qaboos University (1)
Poland	Polish Academy of Science (1)
Portugal	Institute of international scientific and technological cooperation (ICCTI) (1)
Romania	Academy of Sciences (AS) (1)
Russia	Russian Academy of Sciences (ASR) (1)
Slovakia	Slovakian Academy of Sciences (SAV) i
Slovenia	Slovenian Ministry of Science and Technology (1)
South Africa	NRF (National Research Foundation) (1)
South Korea	Korea Science and Engineering Foundation (KOSEF) (1)
Spain	Consejo Superior de Investigaciones Científicas (CSIC) (1)
Sweden	Swedish Council for Research in Humanities and Social Sciences (HSFR) (1)
Switzerland	Swiss National Foundation for Scientific Research (FNRS) (2)
Taiwan	National Science Council (NSC) (1)
Tunisia	General Directorate for Scientific and Technical Research (DGRST); States Secretariat of Scientific Research and Technology (1)
Turkey	The Scientific and Technical Research Council of Turkey (TUBITAK) (1)
Ukraine	National Committee for Science and Technology; Académie des Sciences, Ministry of Education of the Ukraine (1)
UK	Royal Society (RS) (1)
United States	National Science Foundation (NSF) (1)
Venezuela	National Council of Scientific and Technological Research (CONICIT) (1)
Vietnam	National Centre of Natural and Technical Sciences (NCNST-VN); National Centre of Social Sciences and Humanities (CNSSH) (1)

Notes: (1) obligation for joint project proposal (2) no joint deposit needed (3) Allow for a subsidy for a post-doctoral stay.

Source: CNRS

7.6 CEMAGREF

The CEMAGREF is a public research organisation in the field of agricultural and environmental engineering. In 1995, CEMAGREF set new priorities for international cooperation. They primarily concern the European Union, the countries of the Mediterranean Basin and Central Eastern Europe. Outside these regions, cooperation is only undertaken in the field of agricultural water.

Bilateral cooperation is mostly developed case by case, especially in Central Eastern Europe (most particularly Hungary, Czech Republic and Poland) cooperations are still sporadic and be better structured. Co-operation is mostly organised in networks; nevertheless, some bilateral agreements can be pointed out (Morocco, Tunisia, Turkey, Ukraine and Russia, Czech Republic).

7.7 CEA

The CEA (Commissariat à l'Énergie Atomique) is the main French actor in the field of nuclear research. Its bilateral cooperation policy is depending on the field of cooperation:

- In the case of atomic research, international cooperation is strictly defined, and is forbidden with certain countries (i.e. India, Pakistan, North Korea and Israel). Treaties of non-proliferation are the ground rules. With North Korea, there is an attempt to develop civil nuclear research in exchange for an exit from military nuclear engagement. With Russia, contracts are mixed, both bi- and multinational, for example on the treatment of nuclear plutonium. All these agreements are related to the global agreements of disarming.
- In the case of civil nuclear research, the CEA is particularly cooperative with European partners, only little with the USA, and more with China, Japan and Russia.
- In the field of non-nuclear research, bilateral cooperation is managed in a decentralised way. The CEA profits from public PAI.
- Basic research is either international (CERN) or bilateral. In general, the CEA uses external programmes of the Ministries, like PAI or post-doctorate programmes.

7.8 INRA

Bilateral cooperation of INRA (National Institute of Agronomic Research) is mainly based on existing programmes of the MAE. Its department for international relations (DRI) has three people in charge of accompanying PAI-programmes. Bilateral agreements on the vertical level are also signed, for instance; the framework agreement with the National Foundation of Agricultural Research in Greece in February 2000. It includes the organisation of seminars, the organisation of a European conference, exchange of researchers, or support for the participation at the 5th Framework Programme.

Another bilateral agreement has recently been signed with INIA (Instituto Nacional de Investigaciones Agropecuarias), the Chilean homologue of INRA.

7.9 INSERM

INSERM, the major French research organisation in the field of health and medical sciences, has 24 bilateral agreements with other countries, mostly with ministries, research councils or associations for medical research. The general design of these programmes is combined financing of a research stay (with a minimum length of some days, and a maximum varying between one month and a year), where the home country of the researcher who is leaving pays travel costs and the receiving country pays the accommodation costs.

Exhibit 22 List of the INSERM bilateral agreements

Country	Partner Administration
Algeria	Directorate of Scientific Research (DRS) of the Ministry for Higher Education and Research
Argentina	National council of scientific and technical research (CONICET)
Australia	National Health & Medical Research Council
Belgium	Commissariat Général des Relations Internationales de la Communauté Française de Belgique (CGRI)
Belgium	Ministry of the Flemish Community (MCF)
Brazil	National Council of Scientific and Technological Development (CNPq); OswaldoCruz Foundation (FIOCRUZ); Fundação de Amparo à Pesquisa do Estado de Sao Paulo (FAPESP)
Canada	Council of Medical Research (CMR)
Chile	National Commission of Scientific Research and Technology (CONICYT); "Human Frontier" programme
China	Academy of Medical Sciences (AMS), Bureau of International Cooperation, Chinese Academy of Science
Germany	Deutsche Forschung Gemeinschaft - DFG
India	Indian Council of Medical Research (ICMR)
Israel	Weizmann Institute
Italy	Consiglio Nazionale delle Ricerche (CNR)
Japan	Japan Society for the Promotion of Science (JSPS),
Morocco	National Centre for Coordination and Planification of Scientific and Technical Research (CNCPRST)
Mexico	National Council for Science and Technology (CONACYT)
Netherlands	Netherlands OrganiSation for Scientific Research (NWO) (2)
Nigeria	Nigerian Institute for Medical Research (NIRMR)
Norway	The Research Council of Norway (Norges Forskingsrad, NFR)
Portugal	Institute of international scientific and technological cooperation (ICCTI)
Quebec	Foundation for Research on Health of Quebeck (FRSQ)
Spain	Consejo Superior de Investigaciones Cientificas (CSIC)
Sweden	Medicinska Forskningsradet (MFR)
Tunisia	General Directorate for Scientific and Technical Research (DGRST)

Source: Inserm

7.10 IRD

It has already been mentioned that international research policy is anchored differently in countries that make part of the priority region for solidarity - that means countries receiving development aid. Two major public research centres are active in these countries, in strong collaboration with the Ministry for Foreign Affairs, namely IRD and CIRAD.

Exhibit 23 shows that more than half of the expenses of the French Research Institute for Development (IRD, formerly Ostrom) are realised outside metropolitan France. 36% of its researchers work abroad, mostly in partner institutions. Brazil and Mexico are the most important partners. Further partner countries are Bolivia, Chile, Columbia, Ecuador, Peru, Venezuela, Costa Rica, Tunisia and Egypt. IRD

researchers are established in 8 West-African countries: Benin, Burkina Faso, Ivory Coast, Guinée, Ghana, Mali, Niger, Senegal. In Central Africa, Cameroon is the most important pole of activity. The IRD further cooperates with Kenya and South Africa, Madagascar. In Asia, several framework agreements have been signed (CNST in Vietnam, National University in Laos). With India, a common research unit will be created in the field of sciences of water. Cooperation with Industrialised countries is primarily working in a multinational framework.

Exhibit 23 Distribution of IRD expenses, by region²⁵

Mainland France	44%
Africa and Indian Ocean	24%
DOM-TOMs	12%
Latin America	13%
Asia / Pacific	7%

Source: IRD

The IRD is active in 3 major scientific fields: Earth and environment, living resources, and society and health.

7.11 CIRAD

Besides the IRD, the Centre of International Co-operation and Agronomic Research (CIRAD) is the second major actor in the combined French policy of research and development aid. The bilateral schemes are more than complex, they are embedded in a global system of national, regional and global cooperation. In concrete projects, the partners are local research organisations; the CIRAD and often an international body like the World Bank. On the organisational level, there exists a complex system of associations aiming to co-ordinate research and development activities.

The CIRAD has the status of an EPIC²⁶, which has two implications for our subject. First, public funding, defined in the yearly research budget only assures 68% of financing, with the rest coming from contracts. Second, an EPIC can have contracts with private companies as well as with public services.²⁷ This has an impact on the motivation for bilateral cooperative relationships, as the bulk of these contracts finance 30% of CIRAD's activities. According to the Director of external relations, the CIRAD is therefore very problem oriented in its cooperation contracts. The CIRAD has signed some bilateral agreements on the central level, but in general they are frameworks with no specific budget or programmatic content. However, every year, between 400 and 500 contracts are signed, some of which are bilateral.

7.12 INRIA

Within the National Research Institute in Informatics and Automatics (INRIA), the delegation for international relations is in charge of bilateral agreements. INRIA has

²⁵ The IRDs total budget in 1999 amounted to 1,12 mrd FF, out of which 76 % have been spend on salaries of 2 300 persons employed

²⁶ Etablissement public à caractère industriel et commercial

²⁷ In contrast to that, an EPST like the IRD or the CNRS have their whole budget assured by 4 year contracts with the state, and need to create an affiliate if they want to have a contract with a private company.

signed bilateral agreements with 9 partner institutes in different countries, but – as in all institutes – bilateral exchange is not limited to these agreements. Cooperation is well developed in the framework of European programmes, researchers exchange is taking place partly in the framework of bilateral agreements on the national level (PAI). Exhibit 24 and Exhibit 25 provide data about incoming and outgoing visits of researchers by region:

Exhibit 24 Foreign visitors at INRIA in number and duration (person years)

	In numbers				In duration			
	1996	1997	1998	1999	1996	1997	1998	1999
Western Europe	166	242	259	237	82,45	89,37	83,61	73,10
Central & Eastern Europe	113	123	114	112	39,60	42,38	37,44	36,52
North America	87	112	110	90	31,17	28,82	28,07	24,32
South America	55	58	57	60	25,33	30,44	28,04	26,45
Maghreb	134	173	171	195	69,76	80,07	72,51	73,67
Middle East	36	41	54	68	17,24	17,72	20,05	25,66
Africa without Maghreb	22	23	28	27	10,32	7,83	11,61	12,28
Asia	50	56	68	82	18,97	20,40	27,54	29,05
Oceania	7	8	11	11	1,73	1,81	2,83	2,12
TOTAL	670	836	872	882	296,5	318,8	311,7	303,1
					7	4	1	7

Exhibit 25 Missions to foreign countries by researchers from INRIA

	1996		1997		1998	
	number	duration	number	duration	number	duration
Western Europe	1247	17,17	1334	18,08	1465	21,71
Central & Eastern Europe	114	2,66	79	1,92	77	2,13
North America	478	15,07	481	18,58	547	19,66
South America	27	1,34	35	1,31	24	1,88
Maghreb	49	0,99	32	0,73	103	1,98
Middle East	16	0,52	56	1,47	49	1,29
Africa without Maghreb	20	0,58	10	0,28	49	1,31
Asia	98	2,95	104	3,71	134	5,27
Oceania	13	0,70	12	0,62	34	2,20
TOTAL	2062	41,98	2143	47,00	2482	57,44

Source: <http://www-direction.inria.fr/international/statglob.html>

7.13 List of non-European bilateral agreements

	Partner Country	Contact	Financing
Programme France-Berkley 1997-1998	United States	MAE	Incremental costs of cooperation
Programme of scientific and technological cooperation	Quebec	MAE, MENRT, Bureau Amérique	1 week – several months, travel of French and stay of Quebec researchers in France
CAPES/COFECUB and NORTE	Brazil	COFECUB, Université de Paris XII Val de Marne, 01 45 17 12 63 or 01 45 17 12 64	Scholarships for high level students (up to PhD studies), missions of French researchers in Brasil
Co-operative Programme for postgraduates (PCP), with COLECIENCIAS	Columbia	ENSGTI, Université de Pau et des Pays de l'ADOUR, M. Michel Roques, Tel: 05 59 72 20 85	Short mobility; PhD scholarships

	Partner Country	Contact	Financing
Cooperative Postgraduate Programme (PCP), with CONACYT ECOS North	Mexico	ENSIGCT, INP Toulouse, M. Joël Bertrand, Tel: 05 62 25 23 40 Ecos.Nord@ecos.univ-paris5.fr	Short mobility, each country pays expenses in its own currency. (travel and stay). Scholarships for doctoral and post-doctoral studies.
Cooperative Postgraduate Programme (PCP), with CONICT ECOS North	Venezuela	ENSIGCT, INP Toulouse, M. Michel Roques, Tel: 05 59 72 20 85 Ecos.Nord@ecos.univ-paris5.fr	Short mobility, each country pays expenses in its own currency. (travel and stay). Scholarships for doctoral and post-doctoral studies.
ECOS North	Columbia,	Ecos.Nord@ecos.univ-paris5.fr	Short mobility, Travel costs for French researchers, stay for guest researchers. Scholarships for longer stay (doctoral and post-doctoral studies)
ECOS South	Argentine,	Ecos.Sud@ecos.univ-paris5.fr	Short mobility, Travel costs for French researchers, stay for guest researchers. Scholarships for longer stay (doctoral and post-doctoral studies)
ECOS South	Chile	Ecos.Sud@ecos.univ-paris5.fr	Short mobility, Travel costs for French researchers, stay for guest researchers. Scholarships for longer stay (doctoral and post-doctoral studies)
ECOS South	Uruguay	Ecos.Sud@ecos.univ-paris5.fr	Short mobility, Travel costs for French researchers, stay for guest researchers. Scholarships for longer stay (doctoral and post-doctoral studies)
Programme for education through research	Algeria	MAE, Direction de la Coopération, Sous-Direction du Maghreb – Bureau Algérie, Tel: 01 43 17 84 82	Only for Algerians coming to France (not the other way), Scholarships.
CEDRE	Lebanon	Ministry for Foreign Affairs and Ministry for Culture and Higher Education	
Programme for education through research (CMIFM, Comité mixte inter-universitaire Franco-Marocain) Agronomic projects for Development (PRAD)	Morocco	CMIFM: Université de Perpignan, M. Daniel Bodiot, Tel: 04 68 66 22 89 PRAD: MAE, Direction de la coopération Scientifique et Technique, Sous-Direction du Maghreb, Bureau Maroc, Tel:01 43 17 93 74	CMIFM: Invitations to French or Moroccan research labs, scholarships. PRAD: cost-overrun due to cooperation.
Programme for education through research (CMCU: Comité Mixte de Coopération Universitaire)	Tunisia	MAE, Direction de la coopération Scientifique et Technique, Sous-Direction du Maghreb, Bureau Tunisie, Tel: 01 43 27 85 24 CMCU: M. Huber Coudanne, 01.60 19 09 32 Agence pour l'Accueil des Personnalités Etrangères (APAPE)	Invitation for Tunisian researchers in French universities and research labs, missions for French researchers in Tunisia, financial support for Tunisian researchers, tranships and scholarships.

	Partner Country	Contact	Financing
		Tel: 01 43 17 70 32	
French-South African programme of scientific research cooperation	South Africa	MENRT Délégation aux Relations Internationales et à la Coopération, Tel: 01 55 55 64 80 MAE Direction de la Coopération scientifique et technique, 244 bd St. Germain, Tel: 01 43 17 89 43	Co-operation projects of mixed teams Financing of missions to partner institutes, specific and limited participation in financing of research, some financing of equipment, up to 300 000 Francs in 2 years.
arc en ciel-Keshet	Israel	AFIRST: Association Franco-Israélienne pour la Recherche Scientifique et Technologique; Tel: 01 45 50 47 47	Travel costs and scholarships
French-Chinese Association for Scientific and Technical Research (AFCCRST), French-Chinese Programme of Advanced Research	China	AFCRST, Tel: 01 45 33 11 33	Specific subjects (Biology, biotechnology, environment, Information Science and Information Technology, Material, Science of the Earth). Researchers exchange up to 6 months, Scholarships for Chinese students. Logistics, Documentation, Meetings.
CEFIPRA	India	CEFIPRA – IFCPAR New Delhi Tel: ++91 11 464 83 65	Project assistance, exchange of researchers, material, scientific seminars, formation of researchers.
FAIR: Programme France Australie Industrie Recherche AFCRIA: Association Française de Coopération en Recherche Industrielle avec l’Australie	Australia	AFCRIA – FAIR Institut Français du Pétrole, M. Leprince, Tel: 01 47 52 60 00	For industrial companies, focus on innovating SME and SMI, research centres of Universities, Chambers of Commerce and Industry. One aim is to facilitate research of industrial partners.

8 Ireland

8.1 Introduction

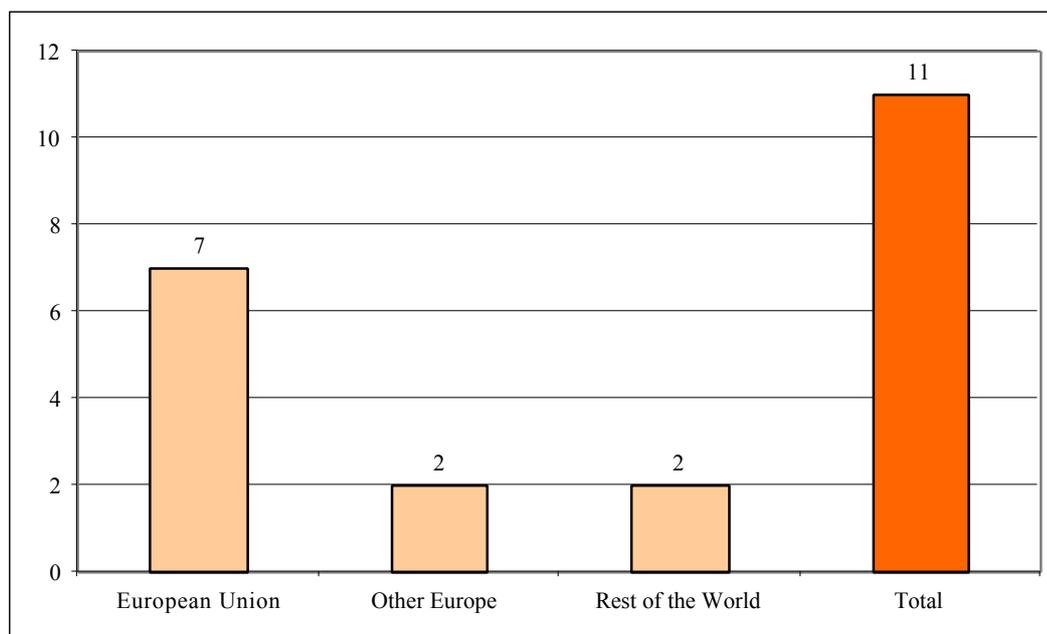
Ireland has 11 formal bilateral R&D agreements, mostly concentrated on specific regional requirements. This small level of activity reflects the strong policy preference for researchers to pursue international cooperation in R&D through the CEC Framework Programmes.

All of the Irish bilateral R&D agreements are signed by government representatives and administered by national administrations. Most of the agreements are based on specific themes, only 4 agreements of the 11 recorded defined an open area for the applicants. The seven 'specific' agreements cover themes such as:

- Food quality and safety
- Animal health, rural development, agri-food modelling and research
- Biomedical Sciences and Health Research
- Humanities and social science

Exhibit 26 shows the geographic distribution of the agreements. The 11 agreements involve 8 Countries, 4 of which are within the EU, 2 Other European Countries and 2 non-European countries.

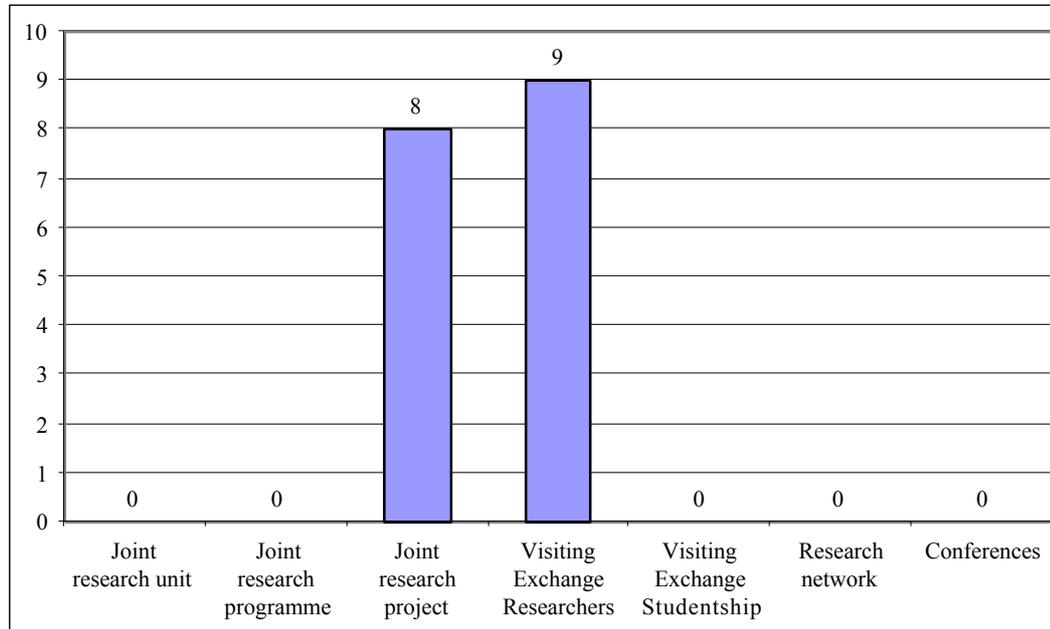
Exhibit 26 Distribution of Irish bilateral R&D agreements by geographic region, by number of agreements current in 2000



Source: Technopolis, compiled from various official sources including Enterprise Ireland

The majority of the Agreements fund the exchange of researchers (the contribution includes only participants' travel and stay expenditures) and "common research projects".

Exhibit 27 Dominant mode of international cooperation for Irish bilateral R&D agreements current in 2000 (number of agreements)



Source: Technopolis, compiled from various official sources including Enterprise Ireland

8.2 Enterprise Ireland

Enterprise Ireland (EI) is the government organisation charged with assisting the development of Irish enterprise. Their core mission is “to work in partnership with client companies to develop a sustainable competitive advantage, leading to a significant increase in profitable sales, exports and employment”. EI organise two different schemes in collaboration with the British Council.

- **Research visits to the UK.** This scheme, in cooperation with the British Council, facilitates Irish and UK researchers in developing collaborative research projects. Support is given for travel and subsistence costs associated with short term visits.
- **Research visits to France.** This scheme is carried out in cooperation with the National research Council of France (CNRS). The aim of the scheme is to encourage Irish and French researchers to initiate and develop mutual research projects.

8.3 The Health Research Board

The *HRB - Health Research Board* organises Research Project Grants called "North-South Co-operation". This Bilateral Scheme is organised in collaboration with the Northern Ireland R&D. The aim of these grants is to develop joint research project grants in biomedical sciences, health research and health services research.

The purpose is to stimulate cooperation between research investigators in the Republic of Ireland and in Northern Ireland by making grant support available for joint health research projects of a high quality. All areas of health and biomedical research are eligible, including health services research. Awards will be co-funded by the HRB and the HPSS Northern Ireland R&D Office. The HRB will provide up to a maximum of Ir£40,000 pa for the Republic of Ireland partner and the HPSS R&D Office will provide up to a maximum of stg£40,000 pa for the Northern Ireland partner. The award may be used for research scholars, small items of equipment, consumables and travel.

Awards will be conditional on the Board and the HPSS R&D Office being satisfied that the project is genuinely collaborative with each partner providing complementary skills. Applications will be assessed both on the quality of the research proposed and the quality of the North-South collaboration. Awards may be sought for one, two or three years.

Other bilateral agreements include:

- The Matching Funds Agreement between the Irish Government and the Wellcome Trust (1997). It is designed to increase the capacity of Irish research in the biosciences and health services research.
- The Memorandum of Understanding between the Irish and UK Governments and the US National Cancer Institute (1999). This agreement is designed to promote cancer research on the island of Ireland.
- Agreement with the R&D Office in Belfast on joint funding of research projects and fellowships (1999). It is designed to promote all forms of research for health on the island of Ireland.

8.4 Teagasc

Teagasc is the leading organisation in the fields of agriculture and food research in Ireland. The research portfolio comprises some 300 projects, which involve some 200 scientists in nine research centres. *Teagasc* collaborates with Irish universities and sponsors a post-graduate fellowship programme, which supports more than 100 M.Sc. and PhD students annually in their research centres, enhancing this collaboration. They participate extensively in EU Framework Programmes. *Teagasc* has bilateral S&T agreements with research organisations in Britain, France, Spain, the USA and New Zealand.

8.5 The MARINE INSTITUTE

The *MARINE INSTITUTE* and the National Oceanic and Atmospheric Administration (USA) signed a Joint Statement of Understanding for Research and Technology Development. Moreover there is the INTERREG Programme 1994 – 1999, Maritime (Ireland/Wales). The aims of the joint Ireland /Wales INTERREG II Programme ("Maritime INTERREG") are to:

- 1 Promote the creation and development of networks of cooperation across the common maritime border and where relevant to link these networks to wider Community networks in the context of the Single European Market.

- 2 Assist the eligible border region of Wales and Ireland to overcome development problems, which arise from its relative isolation within the European Union.

This will be achieved in the main through the upgrading of major transport linkages between the two parts of the region and to the rest of the EU. The development will be carried out in such a way as will benefit the constituent populations and in a manner compatible with the protection and sustainability of the environment.

In order to achieve its strategic objectives the programme is divided into two Areas:

9 Italy

9.1 Introduction

The main institution that establishes Bilateral R&D Co-operation agreements is the Ministry of Foreign Affairs (MAE), through its Directorate General for Cultural Promotion and Co-operation.

Agreements on Cultural and Scientific Co-operation within the Ministry of Foreign Affairs are being concluded with a growing number of countries. These agreements are made operational by means of Executive Protocols, which establish the specific operations to be carried out within each programme. During the course of the year, new Cultural Agreements and Scientific and Technological Co-operation Agreements as well as the Executive Protocols for Cultural Agreements and Scientific and Technological Co-operation Agreements will be negotiated and signed. These Agreements and Protocols will be forged in close collaboration with the other Ministries and the major Research centres.

A special cooperation programme is underway with the Ministry of Universities and Scientific Research (MURST) and with the (CRUI) aimed at fostering the development of ties between Italian and foreign Universities.

Inter-governmental Agreements on Cultural and Scientific Co-operation are being concluded with a growing number of countries.

9.2 Initiating scientific and technological cooperation.

The main instruments used to carry out this activity are the science attaché offices within Italian embassies. The numbers of these offices are now being strengthened by arrangement with the MURST; as well as the major research centres, such as:

- the Italian National Research Council (CNR)
- the Organisation for New Technologies, Energy and the Environment (ENEA),
- the National Institute of Nuclear Physics (INFN)
- the Higher Institute of Health (ISS)
- the International Centre for Science and High Technology in Trieste
- the National Institute of Physics of Matter in Genoa (INFM)
- the Italian Space Agency (ASI)
- the National Institute of Geophysics (ING)

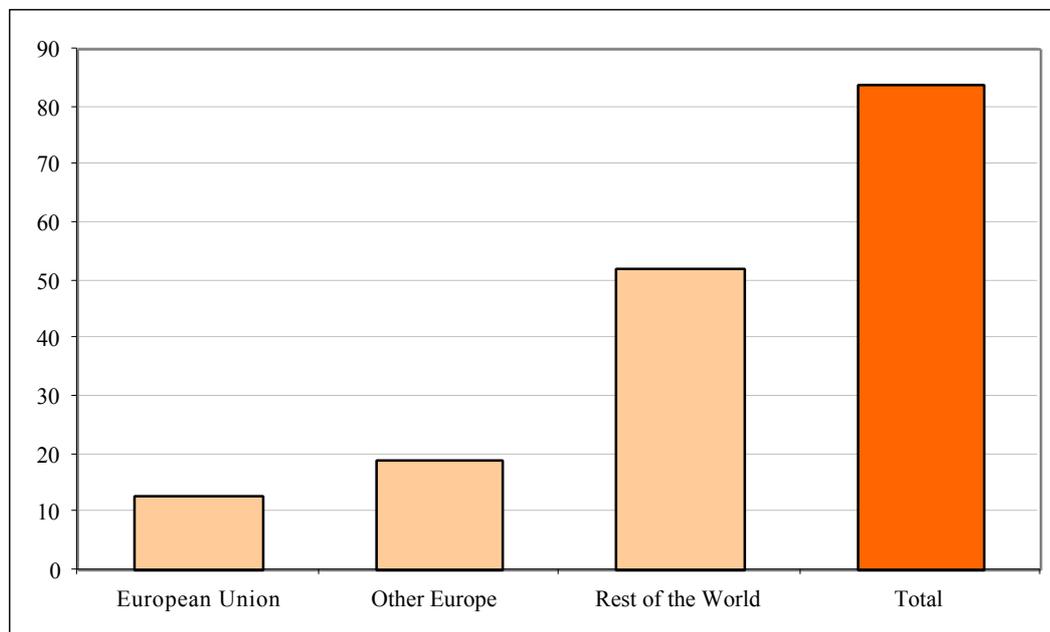
9.2.1 Policies of Bilateral agreements

In Italy, intergovernmental bilateral agreements are formulated through a two-tier hierarchy. A 'headline' agreement is signed by officials and political representatives of the Ministry of Foreign affairs. This agreement is a legal framework within which individual scientific administrations and institutions are permitted to develop their own bilateral agreements. In the case of government S&T agreements, we can talk

about *government push* agreements or *institution pull* agreements. In the first case the MAE and its counterparts develop and plan future collaborations by launching a Science and Technology Bilateral Agreement at Government level focusing on a wide range of aspects of research or areas, trying to involve a higher number of Italian actors and Universities. However, we can talk also of *institution pull* agreements if, at the government level, there is only a Cultural agreement but the MAE decides to set up an S&T agreement pulled by existing agreements stipulated by two or more institutions.

Exhibit 28 shows the geographical distribution of the 84 intergovernmental bilateral R&D agreements, which we recorded in Italy. Those agreements involve 56 Countries, nine of which are EU member states, 17 Other European Countries and 30 non-European countries.

Exhibit 28 Distribution of Italian bilateral R&D agreements by geographic region, by number of agreements current in 2000



Source: Technopolis, compiled from various official sources

81 of the 84 agreements are based on legal contracts. In practice, a MoU is a preliminary stage prior to the contract whereby the two countries stipulate defining terms in the development of their common activities. The majority of MoUs comprise highly generic terms of reference, which give the parties latitude to sponsor joint actions on an ad hoc basis. Where the typical MoU is very open with respect to the ‘what’ and ‘how,’ there is a tendency to define the national research institutes or groups that are expected to be involved in these collaborations. In some instances, individual professors might be named in the MoU as being responsible for the promotion of an international alliance directed to one aspect or another of scientific endeavour. The terms and conditions associated with intergovernmental contracts are more extensive and define in a reasonably precise manner the terms and conditions that hold for matters such as intellectual property.

90 per cent of the agreements are goodwill agreements with no specific scientific focus, only seven agreements have specific themes (see Exhibit 29). Focused agreements are the exception and arise for any one of a number of reasons, including but not limited to: the degree of specificity in the responsibilities of the host administrations and the coincidence between the interests of the host administrations and government policy in a more general sense.

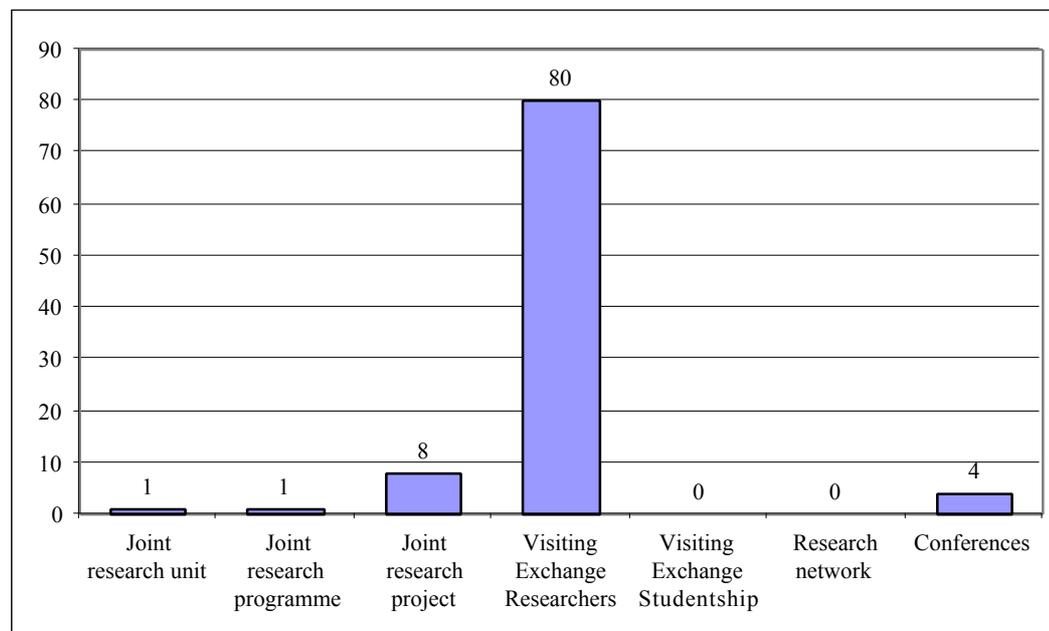
Exhibit 29 Italian bilateral S&T agreements, with a thematic focus

Administration	Partner	Thematic focus
CNR	Australia	Material sciences, vine and wheat genetics, contaminated sediments, radio astronomy and disease of forest trees. Agribusiness, environment and natural resources
ING	USA	Earth Sciences
MAE	Albania	Health care; Agronomy; Veterinary; Geology; Environment; Urban issues; Telecommunications; Archaeology; IT
MAE	Argentina	Agriculture; Biochemistry; Energy; Informatics; Physics; Education
MAE	Nepal	Physio-pathology, Environmental sciences, Geology, Geophysics, Botany, Zoology, Energy, Ethnology, Archaeology
MAE	Slovenia	Agriculture and environment as priority, but open to all fields
MAE	South Africa	Basic and Applied research in Biology, Physics, Medicine and Social Sciences; Industrial research and technological innovation; Focus on Agriculture, environment.

Source: Technopolis, compiled from various official sources

Exhibit 30 shows the distribution of the dominant modes of cooperation as foreseen by each of the 84 agreements. The chart reveals that Italian agreements favour ‘researcher exchange’ as the preferred mode of cooperation. However, in contrast to the general picture, ministerial agreements foresee collaborative projects as the dominant form of cooperation, actions that typically last 2 or 3 years.

Exhibit 30 Dominant mode of international cooperation for Italian bilateral R&D agreements current in 2000 (number of agreements)



Source: Technopolis, compiled from various official sources

Project expenditure is not tracked by the administrations' management information systems, so no good picture of activity is available. However, each MAE agreement has an annual budget, which typically fall in the range of L. 400million to L. 500 million. However, there are exceptions and a small number of agreements have budgets on the order of L. 5 billion.

10 The Netherlands

10.1 Introduction

Bilateral R&D cooperation in the Netherlands proceeds generally from the initiatives of individual researchers. University to university agreements or institute to institute agreements are widespread. Government intervention is not necessary in such cases. The Netherlands has centralised R&D agreements, i.e. inter-governmental agreements or agreements between the Ministry of Education, Culture and Science (OC&W), the Royal Dutch Academy of Sciences (KNAW) and the Research Council (NWO), and partner administrations, with only a few countries. The purpose of a concentrated approach is to develop structural and long-term cooperation with selectively chosen countries. The objectives for centralised international scientific cooperation, in the Netherlands, in general are:

- Strengthening the quality of Dutch research by linking up to the best knowledge in other countries;
- Applying international science policy according to the goals of the overall external policy which guards the economic and cultural interests of the Netherlands and contributes to peace and safety (OC&W, 1999).

The centralised bilateral agreements are largely generic, i.e. relating to any scientific discipline, and often only conceive the mutual exchange of researchers. It may be argued that these R&D agreements are motivated primarily by the requirements of the overall external policy. Only with a limited number of countries have strategic agreements been reached, i.e. far-reaching forms of cooperation in areas of importance to both countries. Of particular importance in this respect are neighbouring countries and the border regions. Bilateral R&D agreements are part of a wider attempt to come to one open space for research and education in the area of the Netherlands, Flanders, Nordrhein-Westfalia, Niedersachsen, and Bremen.

10.2 The agreements

Exhibit 31 lists the 17 countries with which the Netherlands has intergovernmental bilateral agreements. In several cases, for example with France and Germany, there are bilateral agreements between more than one Government ministry or national scientific administration.

Exhibit 31 Bilateral agreements of the Netherlands, June 2000

• Australia	• Germany	• Poland
• Bremen	• Hungary	• Russia
• China	• India	• Slovak Republic
• Czech Republic	• Indonesia	• South Africa
• Flanders	• Japan	• Taiwan
• France	• Nordrhein-Westfalen	

Source: Compiled by Technopolis from various sources, written and oral.

The agreements exhibit a clear geographical pattern:

- border regions
- countries inside Europe
- countries outside Europe

Another feature of the agreements is their focus on emerging markets. Disregarding the border regions, cooperation in Europe is largely with Central and Eastern European countries, bilateral cooperation outside Europe mainly with Asian NICs (Newly Industrialising Countries). This feature reflects that bilateral R&D cooperation in the Netherlands is often based on considerations of economic and foreign policy. Especially, the Asian NICs, i.e. China, India, Indonesia and Taiwan, seem more interesting to the Netherlands for economic reasons than on pure scientific-technological grounds. The intensive cooperation with these countries fits in the context of their accession into the EU. Bilateral cooperation with these countries is marked by participation in the Fifth Framework Programme.

Organisations having centralised bilateral R&D agreements in the Netherlands are the Ministry of Education, Culture and Science (OC&W), the Royal Dutch Academy of Sciences (KNAW) or the Research Council (NWO). There is a positive correlation between the level at which the agreements have been reached and the type of cooperation that they conceive. The agreements of the KNAW and NWO stipulate the exchange of researchers, while the agreements of the ministries conceive of more comprehensive forms of cooperation, e.g. cooperation programmes, the institution of joint research schools and the development of joint research programmes, or the development of joint facilities and research infrastructures. The bilateral agreement between NWO and the Deutsche Forschungsgemeinschaft, GmbH (DFG), which conceives the cooperation between research schools and *Graduiertenkollegs*, and between Dutch and German research units aimed at joint research programmes, is the only exception to this otherwise strict division of labour.

The majority of bilateral R&D agreements in the Netherlands, once reached, are enduring. There is no end date specified and revisions – if any – are minor. This implies that bilateral R&D agreements envisage long-term, stable cooperation.²⁸ However, in a few notable cases bilateral R&D cooperation is based on a MoU. This means that cooperation is evaluated at regular intervals. Depending on the evaluation result, cooperation will be continued or ended. This is the case for the cooperation with Hungary, Russia, Indonesia and China. Co-operation with these countries has been established only recently. Nevertheless, the programmes for cooperation are extensive. Therefore, an MoU is favoured.

²⁸ The exceptions are when a contract has been signed on one specific project with a foreseeable ending. For instance, the Netherlands and Flanders signed an agreement to build a multipurpose bundle line at ESRF together. The agreement expired upon completion of the project. The same holds for cooperation with France concerning the development and construction of the particle accelerator AGOR.

10.3 Resources allocated to bilateral R&D cooperation

The trend in the amount of resources allocated to mobility programmes for researchers and cooperation programmes is more or less constant, or – perhaps – slightly increasing. Annual spending on cooperation with Hungary and Russia increased in 1997, when a new MoU was signed, and has been constant since. Programmes for the exchange of researchers are generally quite invariable. The trend in expenditure is matched by the trend in the number of projects and the number of researchers involved in these projects.

On the other hand, there is increasing cooperation with Germany and Flanders in the area of joint research schools and joint research programmes, and joint facilities and research infrastructures. Especially in 1997 and 1998, several initiatives of this kind were announced. Moreover, recently (1999) the programme of NWO and DFG for cooperation between research schools and *Graduieratenkollegs*, and between Dutch and German research units aimed at joint research programmes was launched. The amount of money involved in these cooperation activities was considerable and will most likely entail an increase in the overall amount of resources allocated to bilateral R&D cooperation. However, the increase is difficult to validate quantitatively.

The total sum allocated to bilateral R&D cooperation is relatively modest. For instance, the budget for multilateral cooperation in European research organisations (e.g. CERN, ESA, ESO, EMBL, EMBC) was fl 141 million in 1999. Nevertheless, this should not be taken as a sign that bilateral R&D cooperation is unimportant in the Netherlands. Rather, it reflects that bilateral R&D cooperation is not of interest with just any country. The relatively modest resources allocated to bilateral R&D cooperation derives from the concentration on a small number of countries with particular importance to the Netherlands.

10.4 Co-operation and scientific disciplines

Co-operation in the context of centralised bilateral R&D agreements in the Netherlands includes:

- mutual exchange of researchers
- cooperation programmes
- institution of joint research schools and development of common research programmes in specific areas
- the common development and use of facilities and infrastructures

Mutual exchange of researchers takes place with nearly all partner countries. The KNAW and NWO administer a range of grant programmes for this purpose. The programmes conceive the funding of mobility costs (travel and dwelling) of individual researchers. There is no theoretical *a priori* specified in the programmes.

Co-operation programmes have been set up with Russia, Hungary, China and Indonesia. The programmes with Russia, Hungary and Indonesia entail the subsidising of joint research projects between Dutch and Russian, Hungarian and Indonesian institutes of higher education and research. The programmes with Hungary and Russia specify alternating areas of science. For 1999 the area of

priority with Hungary was physics. The areas of priority with Russia in 1999 were neuro-medical science, mathematics and information science, and new materials. Co-operation with Indonesia has recently been focused on a number of priority areas as well. In the case of cooperation with China, the emphasis is on cooperation of Dutch institutes with top institutes in China (the so-called Key Laboratories). In addition 2+2-projects have been set up. In these projects, a research institute and a firm in the Netherlands co-operate with a research institute and a firm in China. In all four programmes, procurement is based on annual, open calls for proposals. In other words, any one fulfilling the basic requirements in the call is eligible.²⁹

Joint research schools and the development of common research programmes in areas of mutual importance are characteristic of cooperation with Germany and some German *Laender*. For instance, the Netherlands and Germany have founded a research school for climate research, COACH (Co-operation on Oceanic, Atmospheric and Climate Change studies). With Bremen there is intensive cooperation in the area of maritime research. The cooperation involves one Dutch and four German research institutes. The core of the collaboration is the foundation of the European Graduate College for Marine Sciences, in which young scientists can undertake graduate research. Ultimately, the collaboration envisages the further integration of the institutes in terms of a common research strategy, a co-ordinated personnel policy, and the joint planning of large investments in facilities and the use of research ships. Also the cooperation between NWO and DFG aims at setting up joint research programmes and stimulating cooperation between research schools.

With Flanders there is a history of bilateral S&T cooperation with respect to the development and operation of research facilities and infrastructure.³⁰ For example, The Netherlands and Flanders had an agreement to build together a multi-purpose bundle line (DUBBLE) at ESRF in Grenoble; the first agreement expired in 1999 and was replaced by a follow-on agreement for the joint exploitation of DUBBLE.

The foregoing shows a number of interesting features of centralised bilateral R&D cooperation in the Netherlands. First of all, there is a significant, inverse relationship between the extent of cooperation and the respective number of countries with which cooperation exists. The more comprehensive the cooperation, the lower the number of countries with which such cooperation exists. Second, the more comprehensive the cooperation, the more specific the science and the higher the concentration of efforts on a small number of activities. But foremost, this shows that the accent of centralised bilateral R&D cooperation in the Netherlands is on neighbouring countries and border regions. These are the countries and regions with which cooperation is comprehensive. On the other hand, in the case of Poland, the Czech and Slovak Republics, Taiwan, Japan, Australia, India and UK, the mutual exchange of researchers is the only form of centralised bilateral cooperation.

²⁹ In the case of cooperation with Indonesia, quality between the partners in terms of the financial support raised by the institutes involved and external sources is essential. The financial support raised by the respective partner institutes must be substantial so as to reflect their commitment to the cooperation project (KNAW, 1999).

³⁰ However, the relationship with Flanders is on the policy agenda in the context of Cultural Treaty that includes Science and Education. As a result, a lot of cooperation between the Netherlands and Flanders is in the area of the Dutch language and culture.

11 Austria

1.1 Introduction

The Austrian government maintains a number of formal bilateral R&D agreements however, this mode of cooperation is not at the top of the agenda with respect to international research activities. Rather, the government has placed much greater emphasis upon Austria's integration into the European Research System. As such, the Framework Programme and other multilateral schemes dominate research policy. There are four ministries and national scientific administrations that sponsor international cooperation through formal Bilateral R&D agreements. Exhibit 32 shows that the Federal Ministry for Science, Research and Culture is the main exponent of this method of promoting and regulating international research cooperation, albeit at a low level compared with its total R&D budget.

Exhibit 32 Annual budget associated with formal bilateral R&D agreements, by Austrian lead administration

Administration	Budget in 1999
The Federal Ministry for Science Research and Culture (BMWFK)	20.6 million ATS
The Federal Ministry for External Affairs (BMAA)	1.2 million ATS
The Austrian Foundation of Scientific Research (FWF)	c 688K ATS
The Austrian Academy of Sciences	5 million ATS
Total	c 27.5 million ATS

Source: Technopolis, compiled with data provided by various official sources

1.2 The Federal Ministry for Science, Research and Culture (BMWFK)

The BMWFK is the ministry responsible for the financing of university research in Austria and, in addition, is the national administration in charge of international research cooperation.

1.2.1 BMWFK agreements on scientific cooperation (WTZ)

Bilateral Research Agreements called "Agreements of scientific-technical cooperation" (*Abkommen über wissenschaftlich-technische Zusammenarbeit, WTZ*) exist with 11 countries with an annual budget of 6 million ATS in 1999.

Historically, a representative of the Federal Ministry for External Affairs (BMAA) would have been the first signatory to each WTZ agreement. Today, Austria mirrors the arrangements of its partners: if, in the partner country, the Ministry for external affairs has the prime signature, it will be the same for Austria³¹, if the partner institution is the Ministry for Research, the BMWFK will be the first signature. While both ministries are involved in the formulation of most agreements, the policy design and administration tends to be the BMWFK's responsibility.

³¹ This is the case in China, Hungary, Italy, France, and Spain.

In most cases, WTZ agreements have the status of a legal contract.³² They are signed between two Austrian Ministries (for Research or for External Affairs) and a partner ministry.

While not a policy priority for BMWFK, bilateral agreements are increasing in number albeit from a low base. WTZ increased by 14% between 1997 and 1998 and by 41% between 1998 and 1999. The number of agreements is expected to increase further in 2000. The growth is a result of the increased demand for such agreements by partner countries, and not due to a priority given to agreements by the Austrian government. Indeed, Austria plays a very passive role in these agreements. According to BMWFK officials, this passive approach has three main reasons:

1. Around 70% of all Austrian research is performed in universities and public research centres, which have their own budgets for exchange and cooperation programmes. The BMWFK endorses this bottom-up approach, on the grounds that the best conditions for cooperation are harmonious personal and thematic relationships between researchers themselves.
1. Intergovernmental agreements are more costly than inter-administration and inter-institution bilateral agreements in terms of political preparation and administrative effort as they have to be approved by parliament in addition to the coordination of the wider research constituencies of the two countries
2. Austria recognises that the situation is different in other countries, where there is evident enthusiasm for these agreements; this relates mostly to Central-Eastern European countries. There, it seems easier for researchers to get permission to go abroad where there is a legal agreement between the respective governments. In these cases, an intergovernmental agreement permits more mobility and cooperation than would be the case otherwise, so the additional cost is justified. Austria is ready to enter into these arrangements where researchers (and other governments) demonstrate that it will improve relationships

The Austrian Academic Exchange Service (ÖAD) administers all WTZ agreements on behalf of the BMWFK with the exception of the agreement between Austria and the UK, which is administered by the British Council in Vienna.³³ Its role mainly concerns promotion of the agreements and the selection and monitoring of projects. The selection criteria, which are developed by the BMWFK, include the following:

- Scientific value - practical relevance
- Qualification of the applicant and existing infrastructure for the realisation of the project
- Importance of the bilateral relationship in research
- Chances of realisation of the project
- Coherence of the project objectives with priorities of the WTZ agreement

On average, about 50% to 65% of applicants get funding.

³² The agreement with Poland and the Czech Republic are an exception.

³³ The ÖAD manages a database called "*STIMA - Stipendien für ein Studium im Ausland*," which provides an excellent source of data on opportunities abroad and bilateral projects. It can be accessed online by the general public through <http://stimadb.oead.ac.at/>

Exhibit 33 shows the current WTZ agreements, which have been concluded with 11 countries. The table also provides data on the annual Austrian budget for each agreement. Data on actual expenditure are not available.

Exhibit 33 Scientific technical cooperation: budget and travel movements

	Budget assigned to exchange projects in 1000 ATS (incoming and outgoing)			Travel movements in 1999		Total number of projects
	1997	1998	1999	incoming	outgoing	
China	675	278	763	24	26	36
France	587	933	822	95	0 (financed by France)	45
Israel	136	80	153	8	10	9
Italy	194	207	446	43	37	32
Czech Republic	202	618	933			42
Poland	582	653	815	32	83	37
Spain	730	920	1004	107	0 (financed by Spain)	44
Hungary	662	618	963	47	104	33
Great Britain						15
Russia	starts in 2001					
Slovenia	starts in 2000					
Exceptional Projects with Portugal and Palastine			173			
Total	3768	4306	6071			293

Source: ÖAD, 2000.

The geographical orientation of the combined WTZ agreements is not representative of Austrian bilateral cooperation in research in general, which is primarily conducted with western European countries and also with the USA.³⁴ There are several major international research partners where no WTZ exists. Most notably, Austria has no WTZ with Germany where international research cooperation is strong. Nevertheless, the orientation towards Central and Eastern Europe corresponds to a political will, which has been promoted by the then Minister of Research, Mr. Busek, in the early nineties with a well funded "east-west-programme". Following ministers reduced this action line.

Austria is a small country with a broad research base but with rather few outstanding centres of excellence.³⁵ Austria is precluded from participating in certain research fields however, as Austria has no access to an ocean. This situation is reflected in the thematic distribution of bilateral projects, covering mostly technical and natural

³⁴ There is no consolidated data on bilateral cooperation in Austria. This statement is based on a range of written and oral sources and especially our structured interviews with senior officials responsible for international affairs at the Austrian Rectors' conference and in the BMWFK.

³⁵ In international comparison, the most attractive universities, or more precisely institutes of higher education for foreigners are the Austrian music schools in Vienna and the Mosarteum in Salzburg. This attraction has no equivalent on the research side, even if Austria produces high level research.

sciences, as well as fields that are rising generally like information technologies, biotechnology, genetic engineering, and material sciences.

1.3 Bilateral agreements for cooperation in research and education

After the fall of the iron curtain, Austria sought to establish close contacts and exchanges with its neighbouring countries: Slovakia, Hungary and Czech Republic.³⁶ These agreements are signed with partner-organisations in the respective country, not the corresponding ministries but with associations which have been created for these actions. The Austrian Academic Exchange Service (ÖAD) is in charge of the execution of the programme.

In respect of this policy, three "bilateral actions" were launched with a portfolio, or fund, for each country, which varied according to size between 3 million ATS and 4 million ATS. The aim was to support bilateral cooperation in research and education. In practice, research has accounted for only a small element of each portfolio. Most of the funded 'projects' were university lectures, meetings, and joint publications. An evaluation of the bilateral actions was undertaken on behalf of the ministry. The critical finding was that only the immediate project participants benefit from these bilateral actions, even where the original idea was to help initiate long-term cooperation. Most participants have used the agreement to secure finance for a specific and one-off initiative.

1.3.1 Action Austria-Hungary

The annual budget for the Action Austria-Hungary for 1997-2001 is around 8 Million ATS, it is financed to 2/3 by Austria and to 1/3 by Hungary. Exhibit 34 provides the distribution of projects according to the research area.

Exhibit 34 Accorded projects according to the research area in 1999

Research Area	Attributed ATS	Attributed HUF	Number of Projects
Agriculture	608 162	2 529 400	8
Humanities	367 452	3 218 600	12
Law	33 750	44 000	1
Medical Sciences	163 900	2 055 000	4
Natural Science	386 582	3 072 500	10
Pedagogic	154 020	3 223 000	7
Social Sciences and Economics	402 900	5 835 500	5
Technical Sciences	35 400	476 500	1
Other	488 816	6 316 944	3
Total	2 640 982	26 771 444	51

Source: AÖU, Aktion Österreich-Ungarn, Jahresbericht über das Geschäftsjahr 1999

The Action Austria-Hungary also finances scholarships, for summer schools and for one-year stays. As can be seen in Exhibit 35, the balance of interest for these scholarships is biased towards Hungarian participants.

³⁶ Derived from interviews in particular with Mr. Rainer, BMAA and Mr. Wiltschek of the Austrian Academic Exchange Service (ÖAD).

Exhibit 35 Scholarships Austria-Hungary in 1999

1999	Applied	Accepted
Summer schools		
<i>for Hungarians</i>	103	69
Summer schools	254	50
Language courses in Austria		
<i>for Austrians</i>	34	34
Summer schools		
One year stays		
For Hungarians	257	72 (207 months)
For Austrians	4	4 (26 months)

Source: AÖU, Aktion Österreich-Ungarn, Jahresbericht über das Geschäftsjahr 1999

1.3.2 Action Austria-Czech Republic

The first field of activity of the Action are co-operative research projects. In 1999, 76 cooperation projects were presented to the Action Austria-Czech Republic; 58 received financing, which gives a success rate of 76%. Depending on one's definition of research, in 1999, BMWFK committed between 1 million and 3 million Austrian Schillings to bilateral research through this agreement.

The second field of activity are scholarships, which should not pass 40% of all funding of the Action. Whereas Czech students regularly use the entire scholarship opportunities, the demand of Austrian Students is decreasing.

Exhibit 36 Action Austria-Czech Republic, funding by project type (1999)

<i>Project type</i>	<i>Number of projects</i>	<i>Accorded funding in ATS</i>	<i>Accorded funding in CZK</i>
Research cooperations	21	751 200	1 167 500
Guest lectures	8	459 760	212 000
Scientific excursions of students	7	198 700	136 000
Seminars and trainee-ships of students	11	325 736	279 000
Summer Schools	5	314 560	1 757 000
Scientific seminars, symposiums	3	18 760	161 000
Research stays	2	19 500	0
Publications	1	38 500	23 000
Scholarships			
Scholarships for Czech Citizens		1 212 000	
Additional Scholarships for Austrians		132 000	
Scholarships for Austrian Citizens			504 300
<i>Total</i>		<i>3 170 716</i>	<i>4 239 800</i>

Source: Aktion Österreich - Tschechische Republik, Jahresbericht 1999, Prag, 2000.

1.3.3 Action Austria-Slovakia

The Action Austria-Slovakia is financed by the Austrian Ministry for Research and the Austrian Ministry for Education, which together pay two-thirds of the budget (2,9 Million ATS in 1998), and by the Slovak Ministry for Education to 1/3 (1,4 Million ATS). The activities financed in 1998 and 1997 are presented in Exhibit 37:

Exhibit 37 'Action Austria-Slovakia', accepted 'projects' by type of activity

<i>Project type</i>	<i>1998 (ATS)</i>	<i>1997 (ATS)</i>
Sumposiums / Congresses/ Seminars	694 646	724 189
Lectures	86 826	127 803
Publications	173 665	127 803
Scientific- and research cooperations	1 562 943	1 533 566
Excursions	217 078	212 991
Scholarships	1 302 453	1 235 373
Other	45 986	75 804
Administration	257 917	222 389
<i>Total</i>	<i>4341500</i>	<i>4259903</i>

Source: Aktion Österreich-Slowakei, Wissenschafts- und Erziehungskooperationn, 1997-1998, Jahresbericht

1.3.4 Bilateral cultural agreements with a research element

Besides WTZ-agreements, BMWFK does have an interest in several cultural agreements – that ultimately fall under the responsibility of the Federal Ministry for External Affairs – which have a small research element. This is the case especially in countries where no WTZ agreement has been signed.

1.4 The Federal Ministry for External Affairs (BMAA)

A second group of bilateral agreements are "*Kulturabkommen*" (cultural agreements). Here the BMAA is always in charge, and co-operates with the BMWFK and the Ministry of Youth and Education where appropriate. These agreements are MoUs normally, which seek to promote increased cultural cooperation between the two countries. In many cases, the agreements foresee scientific cooperation as one of several possible modes of cooperation. The cultural agreements are bigger than WTZ agreements, and generally reflect their broader remit and ambitions. However, in practice cultural agreements only have a minor research part. The existing agreements have generated scholarships, invitations for conferences and other presentations, and archaeological cooperation.

The annual budget of the Ministry for External Affairs for 1998 for scientific activities reached 11.2 million ATS³⁷. Out of that, 1.2 million ATS have been spent on 26 scientific projects funded in the framework of bilateral cultural agreements. The total budget for cultural agreement-projects amounted to 7 million ATS. So, research accounted for 21% of spend in 1998 up from 11% and 12% in 1996 and 1995.

1.5 The Austrian Academy of Sciences

The Austrian Academy of Sciences has signed bilateral agreements with 34 partner academies in 31 countries. These agreements are the basis for researcher exchanges. The Academy provides visiting researchers with several kinds of financial support, including a per diem,³⁸ reimbursement of cross-border travel and social security contributions. Correspondingly, partner countries finance Austrian participants.

³⁷ See Bundesministerium für auswärtige Angelegenheiten, Auslandskulturbericht 1998.

³⁸ 390,- ATS per day or 10,000,- ATS per month if more than 8 days.

In most cases, the exchange is prompted by researchers' involvement in similar areas of study and the visits generally align with the participants' domestic research projects, they are generally open to all researchers in the Academy. Two fields have been distinguished as having special weight in international projects, namely historical research in the fields of the Austro-Hungarian Empire, and international conferences in the field of high-energy physics. The table shows the annual budget for bilateral cooperation, which is defined annually on the basis of last year's budget, and has increased slightly since 1995.

Exhibit 38 Bilateral agreements of the Austrian Academy of Sciences

Year	Foreign guest-researchers at ÖAW	ÖAW-members/employees in a partner country	Total expenses (ATS)
1995	232	110	4 233 016
1996	247	108	4 089 279
1997	223	152	4 163 336
1998	264	119	4 621 998
1999	243	104	4 988 537

Source: Austrian Academy of Sciences, 2000

Exhibit 39 Bilateral Agreements of the Austrian Academy of Sciences

Country	Partner Organisation	Financing of stay	Financing of travel
Albania	Academy of Sciences, Tirana	special agreement	ATS 6.840
Belgium	The Royal Academy of Sciences, Letters and the Fine Arts of Belgium, Brüssel	special agreement	ATS 4.800
Bulgaria	Bulgarian Academy of Sciences, Sofia	BGL 15.000 p.d.	ATS 3.800
Canada	The Royal Society of Canada, Ottawa	special agreement	
China	Chinese Academy of Sciences, Beijing	Costs of stay assured	ATS 16.600
China	Chinese Academy of Social Sciences, Beijing	- " -	
China	Tibetan Academy of Social Sciences, Lhasa	- " -	
Croatia	Croatian Academy of Sciences & Arts, Zagreb	HRK 110	ATS 1.300,00
Czech Republic	Czech Academy of Sciences, Prag	CZK 280 p.d CZK 7.000 p.m.	ATS 1.300,00
Egypt	Academy of Scientific Research and Technology, Cairo	EGP 40 p.d.	ATS 5.300
Estonia	Estonian Academy of Sciences, Tallinn	EEK 200 p.d. EEK 3.000 p.m.	ATS 7.190
Finland	The Academy of Finland, Helsinki	special agreement	ATS 6.100
France	Centre National de la Recherche Scientifique, Paris	ATS 30.000 p.m.	ATS 4.700
Georgia	Georgian Academy of Sciences, Tbilissi	GEL 10 p.d.	ATS 7.000
Great Britain	The Royal Society, London	ATS 30.000 p.m	ATS 3.200
Great Britain	The British Academy, London	ATS 30.000 p.m.	
Hungary	Hungarian Academy of Sciences, Budapest	HUF 1.100 p.d	ATS 1.140.00
Ireland	The Royal Irish Academy, Dublin	IRP 58 p.d.	ATS 4.600
Israel	The Israel Academy of Sciences and Humanities, Jerusalem	USD 30 (in ILS)	ATS 6.300
Italy	Accademia Nazionale dei Lincei, Rom	ITL 334.000 p.d	ATS 4.350.00
Latvia	Latvian Academy of Sciences, Riga	LVL 10 p.d	ATS 6.690,00
Lithuania	Lithuanian Academy of Sciences, Vilnius	LTL 48 p.d.	ATS 6.480,00
Macedonia	Macedonian Academy of Sciences and Arts, Skopje	special agreement	
Netherlands	The Royal Netherlands Academy of Arts and Sciences, Amsterdam	special agreement	
Poland	Polish Academy of Sciences, Warschau	PLN 45 p.d.	ATS 3.600,00
Romania	Romanian Academy, Bukarest	ROL 20.000 p.d	ATS 3.820,00

Country	Partner Organisation	Financing of stay	Financing of travel
Russia	Russian Academy of Sciences, Moskau	RUB 130 p.d.	ATS 6.000,00
Slovakia	Slovak Academy of Sciences, Bratislava	SKK 400 p.d SKK 8.000 p.m.	ATS 200,00
Slovenia	Slovenian Academy of Sciences and Arts, Ljubljana	SIT 2.907 p.d	ATS 1.450,00
Spain	Council of Scientific Research, Madrid	ATS 25.000 p.m	ATS 5.000,00
Sweden	The Royal Swedish Academy of Sciences, Stockholm	special agreement	
Switzerland	Schweizerische Akademie der Naturwissenschaften, Bern	ATS 30.000 p.m.	ATS 3.100,00
Turkey	Turkish Academy of Sciences, Ankara	USD 23 p.d. USD 580 p.m	ATS 5.800,00
Ukraine	National Academy of Sciences of Ukraine, Kiev	UAH 1.000.000 p.d.	ATS 6.600,00

Source: Österreichische Akademie der Wissenschaften

1.6 The Foundation of Scientific Research, FWF

The Austrian Foundation of Scientific Research (FWF) was established in 1967 to advance basic research in Austria. The FWF has bilateral agreements (Memoranda of Understanding) with 13 countries. Each MOU is valid for 5 years, but there is an assumption that an agreement will be renewed in perpetuity. The objective is to sponsor joint research projects in all scientific areas. Each party pays the labour costs of its national participants. The FWF also finances expenses for travelling and stay in the framework of project-specific cooperations, as far as they have been defined in the application. Whereas the partner organisations have deadlines in their calls for tender, the FWF has opted for a continuously open call. Once a year, both parties decide together on the final choice of the projects. The FWF has no specific budget for these cooperations. In 1999, four joint research projects were approved and have been financed. However, the trend is downward because of the rather complicated tendering procedure.

Exhibit 40 FWF bilateral R&D agreements, as at June 2000

Argentina	Consejo Nacional de Investigaciones Cientificas y Tecnicas de la Republica Argentina (CONICET)
Australia	The Australian Research Council (ARC) 12.09.1994
China	National Natural Science Foundation of China (NSFC) 13.04.1988
Indonesia	The University Research Council of Indonesia (URC)
Israel	The National Council for Research and Development of the State of Israel (NCRD)
Japan	The Japan Society for the Promotion of Science (JSPS)
Korea	Korea Science and Engineering Foundation (KOSEF)
Czech Republic	Grantova Agentura Ceske Republiky (CA CR)
USA	The National Science Foundation of the United States of America (NSF)
USA	The National Institutes of Health of the United States of America (NIH) 30.07.1993
Thailand	The National Research Council of Thailand (NRCT)
Taiwan	National Science Council of Taiwan (NSC)
Hungary	Nationaler Wissenschaftlicher Forschungsfonds Ungarn (OTKA)

Source: Austrian Foundation of Scientific Research

12 Portugal

12.1 Introduction

Since 1997, the Institute for International Scientific and Technological Co-operation (ICCTI), within the Ministry of Science and Technology, has been the main body responsible for Bilateral Agreements. The ICCTI is responsible for directing, guiding and co-ordinating all international cooperation in the fields of S&T.

Exhibit 41 lists the Portuguese bilateral S&T agreements that were current in 2000. For the past several years, Portugal has been entering into a growing number of formal bilateral agreements; from 20 to 30 in the past five years. This is part of an active policy to increase the level of engagement of its domestic researchers with leading scientists and institutes around the world.

Exhibit 41 Portuguese bilateral R&D agreements, current in 2000

Partner	Agreement
Brazil	Agreement ICCTI/CAPES (Fundação Coordenação de Aperfeiçoamento do Pessoal de Nível Superior) Agreement ICCTI/CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) Agreement ICCTI/FAPESP (Fundação do Amparo à Pesquisa do Estado de S. Paulo)
Cabo Verde	Fundo Fácil - <i>open calls</i>
Chile	Agreement ICCTI/CONICYT(Comissão Nacional de Investigação Científica)
China	Acordo de Cooperação Científica e Tecnológica
Czech Rep.	Agreement ICCTI/Academia das Ciências República Checa
Denmark	Agreement ICCTI/DRA (Danish Research Academy)
France	S&T Agreement with the French Embassy Agreement ICCTI/CNRS (Centre National de la Recherche Scientifique) Agreement ICCTI/INSERM (Institut National de la Santé et la Recherche Médicale) Agreement ICCTI/EHESS (École des Hautes Études en Sciences Sociales) Agreement ICCTI/FREMER (Institut Français de Recherche pour L'Exploitation de la MER) Agreement ICCTI/INRA (Institut National de la Recherche Agricole) Agreement ICCTI/INRIA (Institut National de la Recherche en Informatique et Automatique)
Germany	ICCTI/DAAD (Deutscher Akademischer Austauschdienst) ICCTI/BMBF (Bundesministerium für Bildung und Forschung)
Hungary	ICCTI/OMFB (Comité Nacional para o Desenvolvimento Tecnológico)
Italy	Agreement ICCTI/CNR (Consiglio Nazionale delle Ricerche) -
Morocco	Acordo de Cooperação Científica e Tecnológica entre o ICCTI/CNCPRST
Mozambique	Agreement ICCTI/UEM (Universidade Eduardo Mondlane)
Spain	Agreement ICCTI/CSIC - (Consejo Superior de Investigaciones Científicas)
Tunisia	Scientific Agreement
UK	Agreement ICCTI/BC (British Council)
Ukraine	S&T Co-operation agreement
USA	Oceanography Co-operation Agreement (ICCTI, FLAD, NSF) Co-operation Agreement ICCTI/NIEHS (National Institute of Environmental Health Sciences) Co-operation Agreement ICCTI/FULBRIGHT Co-operation Agreement Portugal/NASA

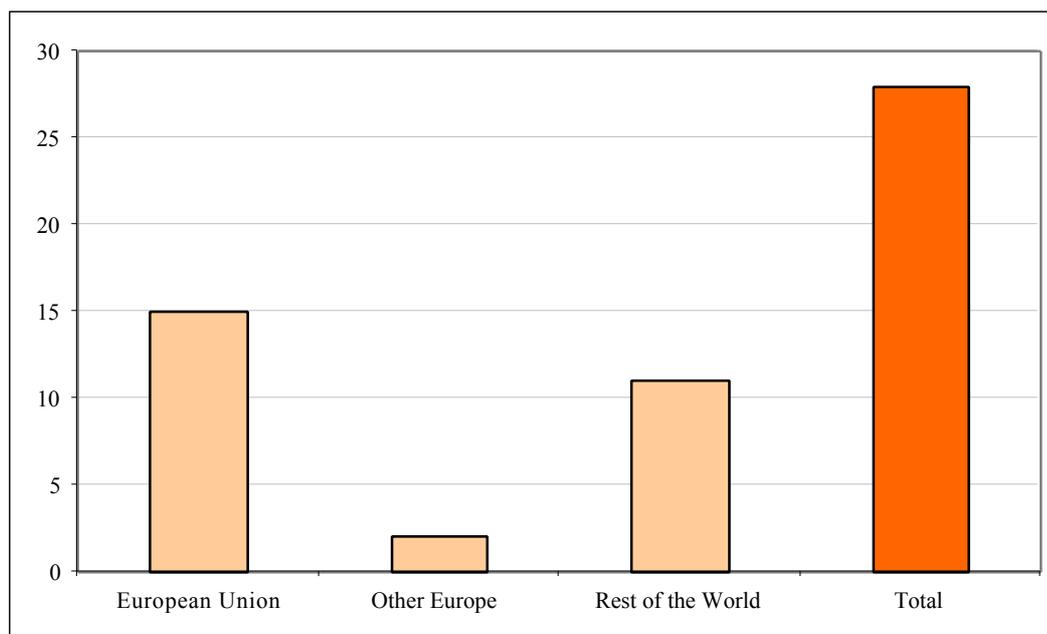
Source: Institute for International Scientific and Technological Co-operation (ICCTI)

ICCTI uses a standard framework to draw up new agreements and to review/renew existing arrangements. The only differences in the contents of agreements are in terms of the range of actions promoted and some legal aspects, which depend on the requirements of the partner organisations.

12.2 Geographical Distribution of the Agreements

Exhibit 42 shows how, when aggregated, these 31 agreements are distributed between major geographical areas. France and Germany are the major partners in the European Union, while in the 'rest of the world' category it is Brazil and the USA that are the partner countries with the largest number of bilateral agreements with Portugal.

Exhibit 42 Geographical distribution of Portuguese bilateral R&D agreements by geographic region, by number of agreements current in 2000



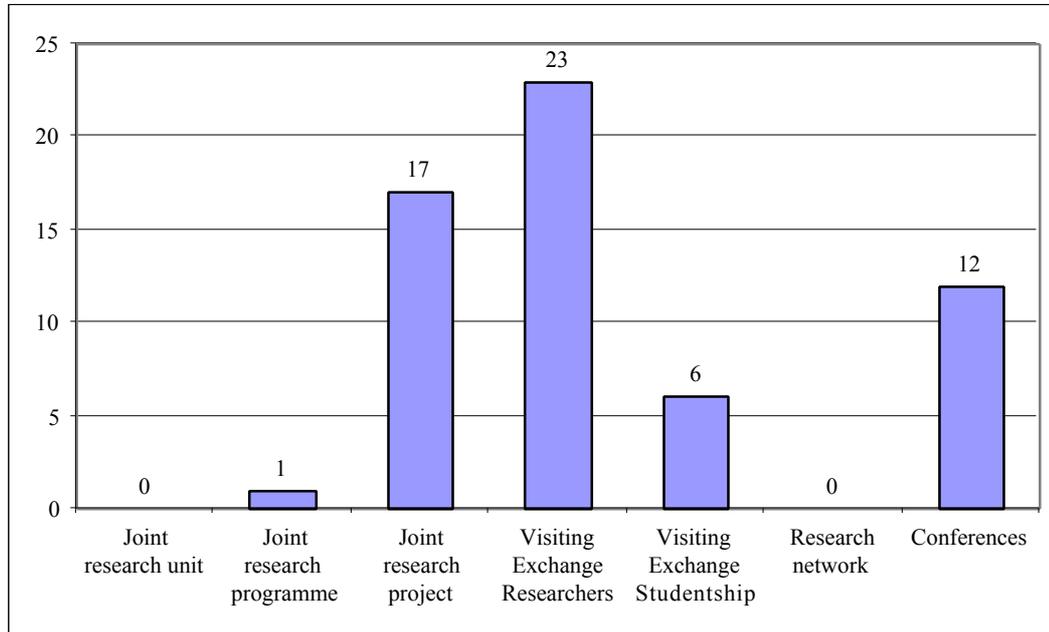
Source: Technopolis, compiled from various official sources

The 31 agreements are distributed between 16 different countries. Six are EU member states and two non-EU European countries. The remaining eight countries are in the 'rest of the world' category, especially with countries that are Portuguese speakers (e.g. Brazil and Mozambique). The split is illustrated below.

Most of Portugal's 31 formal bilateral agreements are inter-agency agreements. Just five of the agreements are inter-governmental. Though most of the agreements are 'open' rather than specific regarding the topic area, 11 of the 31 do have a thematic focus. These agreements are those developed by Portuguese institutes with a particular disciplinary focus, corresponding to that of the corresponding partner institute overseas.

The majority of the bilateral agreements of Portuguese organisations with corresponding institutions in other countries involve the exchange of researchers. However, all of the agreements cover a wide variety of activities. Exhibit 43 shows the distribution of the 31 bilateral agreements in terms of the type of cooperative activities that are foreseen by each as the primary means of cooperation. Exchange of researchers and "common research projects" predominate along with conferences. For the most part, Portuguese administrations do not participate in agreements that promote cooperation through scientific networks, joint programmes or joint research facilities.

Exhibit 43 Dominant mode of international cooperation for Portuguese bilateral R&D agreements current in 2000 (number of agreements)



Source: Technopolis, compiled from various official sources

12.3 Resources allocated to agreements

Spending on individual bilateral agreements is not monitored systematically by the sponsoring administrations. The budget for bilateral international cooperation activities sponsored under the agreements is not separated out, agreement by agreement, but rather it is amalgamated with a general budget line for all "International Activities." As such, it is not possible to provide an estimate of the monetary value of activities sponsored within the 31 agreement without substantial analysis on the part of ICCTI staff.

13 Finland

13.1 Introduction

Overall, intergovernmental bilateral R&D agreements have a limited role in the Finnish government's catalogue of international cooperation measures. There is a tendency to limit such agreements to those instances where the scientific investment warrants a high level of formalism or where a partner country has a presumption that international cooperation between the researchers of two countries can not be supported except where there is an international accord. Geopolitical and or major trading interests might exemplify the former (e.g. Finland-Russia) while several countries in the Far East fall into the second category (e.g. South Korea).

Legally binding intergovernmental agreements are seen as being an unduly formal way to encourage and regulate scientific cooperation. In the Finnish experience, the volume and quality of international cooperation in science is not necessarily improved through such agreements. In addition, such agreements are demanding to negotiate and manage and do not compare favourably, in terms of administrative efficiency, with more ad hoc measures.

The Finnish Ministry of Trade and Industry is in charge of negotiating and managing the content of intergovernmental bilateral R&D agreements. The Ministry of Foreign Affairs prepares and advises on the legal aspects of the R&D agreements; indeed, the Ministry has a cross-departmental responsibility for bilateral agreements, whether they deal with issues of trade, culture or science.³⁹

13.2 Geographical distribution of agreements

In 2000, Finland had eight intergovernmental bilateral R&D agreements (see Exhibit 44). Five of the eight are legal contracts and involve countries that are considered to be strategic partners in terms of future trade and or technology. These countries are *China, Japan, Republic of Korea, Russia* and the *USA*. In addition, Finland has signed memoranda of understanding with *the Ukraine, Brazil* and *Vietnam*.

Exhibit 44 Bilateral agreements by status and geographic region

Status of agreements	Europe	Rest of World
Legal contract	• Russia	• China
		• Japan
		• Korea
		• USA
Memorandum of understanding	• Ukraine	• Brazil
		• Vietnam

Source: Ministry of Trade and Industry of Finland and Finlex, the Finnish government's database of legislative documents

³⁹ In addition to the R&D agreements, other kinds of intergovernmental agreement (e.g. trade agreements) may contain elements that are aimed at promoting scientific & technological cooperation. These other categories have not been considered.

Bilateral agreements with EU member states are not considered necessary because scientific cooperation is well established within the Union's multilateral framework and international relations generally are well-developed.

USA and Japan are world-leaders in several areas of science and technology of strategic importance to Finland (e.g. semiconductors) and hence, there is a strong motive for the Finnish government to pursue more and better bilateral cooperation. There is a strong industrial logic in both these cases and, somewhat unusually within such intergovernmental agreements, Finland has sought to include commercial interests within the agreements. The Finnish side considers it very important that cooperation between private enterprises has now been included in the agreement with Japan. However, while cooperation with Japanese researchers and institutes works well, and is becoming more extensive, the contribution of the intergovernmental agreement is not clear. The Ministry considers that even now the successful relationships are largely based on the initiatives of individuals.

China and the Republic of Korea are large and fast-growing markets already and they have an important role to play in the pace and quality of development of the whole Asian economic area. R&D agreements are seen as an expeditious means through which to establish more extensive relationships, quickly. In the case of China, the agreement has been a significant 'door opener' for increased cooperation among the two countries' scientific communities. The agreement with Korea has been less fruitful to date.

Cooperation with neighbouring Russia is important for Finland because of the geographical proximity and the country's emerging market status. The latest agreement with Russia was signed in 1992, and it represents a continuation of the numerous state level agreements that Finland had with the former Soviet Union. The agreement focuses on the regions that are closest to Finland, including St Petersburg, the Leningrad region, Carelia and Murmansk. It is considered to be in Finland's political and commercial interest to promote economic and technological development in these contiguous regions.

The eight agreements include a mixture of agreements with generic or specific goals. Individual agreements do not specify budgets or include any detailed operational plans. The Ministry of Trade and Industry, which is in charge of the administration of the agreements, does not collect much statistical information on existing bilateral cooperation activities. However, the annual budget for bilateral R&D cooperation is 1.5 billion FIM (250 MEUR). These funds are not specified for any particular country but they form a common resource for overall bilateral cooperation. The Finnish government position on financing is that the parties to a bilateral agreement cover their own costs incurred from the activities.

Some information on activity levels can be gleaned from the minutes of the meetings between government delegates. According to the representatives of the Ministry of Trade and Industry, thousands of researchers are handled each year by its 'Asia Desk,' which is in charge of processing the exchange of researchers with Japan, China and Republic of Korea. Individual private enterprises are themselves in charge of the projects within the framework of bilateral agreements.

As indicated, memoranda of understanding (MoUs) exist with three countries. The MoU with Brazil focuses on cooperation in bioenergy production using peat and other biomaterial as sources of energy. The Ministry of Trade and Industry is the Finnish partner of this contract. Similarly the Technology Department of the Ministry of Trade and Industry signed the MoU with Ukraine in 1999. The agreement with Vietnam has been in place for five years but so far the extent of scientific and technological cooperation has been very limited.

Co-operation between research establishments is co-ordinated by the Academy of Finland, which has an important role in managing operational level activities of bilateral cooperation. It co-ordinates numerous programmes which involve universities and other research establishments. The Academy of Finland also awards personal researcher exchange grants, for research cooperation with: *Belarus, Bulgaria, China, Czech Republic, Estonia, Hungary, Iran, Japan, Korea, Latvia, Lithuania, Poland, Romania, Russia, Slovakia, Taiwan and the Ukraine*. Under these bilateral schemes, researchers can receive funding for research in the host country typically for periods which range from a couple of months up to three years. The academy can also sponsor foreign researchers who go to work in Finland, and scientific seminars among other things.

13.3 The purpose of bilateral R&D agreements

The aim of the existing contracts is to create a fertile ground for bilateral cooperation with USA, Japan, China, Russia and Republic of Korea, which are considered to be strategic partners. In many other cases the bilateral agreements are not considered essential. For instance, Finland already has well established cooperation with the EU member states and the Nordic countries.

In the Finnish case, intergovernmental bilateral agreements provide only a framework for cooperative research activities. Rather than any specific aspects of the agreement, the Finns emphasise the content of the cooperation. It is considered important that the agreements facilitate practical cooperation between academic institutions, research establishments and private sector enterprises. In this respect, the inter-governmental agreement with China is seen as an example of a framework that has contributed to excellent bilateral research cooperation. The exhibit shows the numbers of new and existing Sino-Finnish projects (43 in total, as at June 2000) that have been prompted by the bilateral agreement and are being administered by the Finns within this framework. The agreement has been widely endorsed in Finland with more than 20 leading Finnish research establishments having participated (the column does not sum to a total figure as several of the research establishments are counted in more than one row). This cooperative activity has also involved Finnish businesses.

Exhibit 45 Joint Sino-Finnish R&D projects, June 2000

	No of Projects	Research Establishments	Enterprises
Group C: New Projects	21	18	3
Group B: On-going projects	14	12	2
Group A: Priority projects	8	6	2
TOTAL	43		

Source: Ministry of Trade and Industry.

Finland has a similar type of agreement with the Republic of Korea but in the period since its launch in 1997 (to June 2000), it has produced few cooperative ventures between the research communities of the two countries.

The small number of formal intergovernmental agreements should not be viewed as an indication that Finland does not engage in bilateral cooperation. On the contrary, scientific bilateral cooperation is widespread at the level of individual university departments and research institutes, as well as between private enterprises. In addition, Finish researchers are known to be active in many international networks and the full picture of bilateral research cooperation would require a count of the many ad hoc arrangements between individual researchers.

14 Sweden

14.1 Introduction

In Sweden, bilateral intergovernmental agreements are administered by the research council or agency with responsibility nationally for that area of science, engineering or technology. Swedish Government ministries (Ministry of Education and Science, Ministry of Foreign Affairs) may provide the signatory to the agreement but do not participate directly in the promotion and administration of such bilateral agreements.

With few exceptions, bilateral agreements involving Sweden do not have budgets attached to them; they are 'enabling' agreements to promote the mobility of researchers (through various exchange mechanisms) to promote cross-fertilisation of know how and experiences and to cement international networks.

Any monitoring as such is done by the scientific administration in question (i.e. Research Councils, etcetera). Bilateral agreements do not entail significant research expenditure and, as such, the activity associated with any one agreement is not reported in detail either to the senior executives of the Research Council or to any ministry. As a result, the available records vary greatly in the level of detail presented. The Natural Science Research Council (NFR), for example, is able to identify (for most of its agreements) how many researchers from each country have participated and how many person months have been spent by visiting researchers in the partner country. Unfortunately, the Council is not able to place a monetary value on this activity. The Medical Science Research Council (MFR), on the other hand, has a budget limit for both its agreements, but no figures on actual spend or activity.

14.2 Geographical Distribution of Agreements

In June 2000, Sweden had intergovernmental agreements with the following countries:

EU	Rest of Europe	Rest of the World
France (3)	Poland	Australia
Germany	Russia	China
Netherlands		Taiwan

The agreements are described below. They are grouped according to the Swedish agency responsible for them.

14.3 Research Councils and their Bilateral Agreements

14.3.1 Swedish Natural Science Research Council (NFR)

NFR has five bilateral exchange programmes with foreign agencies. In terms of formal bilateral cooperation, NFR is the most active of the Swedish Research Councils.

Exhibit 46 Swedish bilateral R&D agreements, sponsored by NFR (as at June 2000)

Partner Country	Description of Agreement
Australia	NFR has an agreement on research cooperation with the Australian Research Council (ARC). The cooperation takes place mainly by exchange of information and grants to Swedish nationals for participation in the international projects. No special funds are available. Swedish scientists have to apply with an ordinary application to NFR annually in May.
China	NFR has an agreement on research cooperation with the National Natural Science Foundation of China (NSFC). The agreement includes an exchange of scientists and workshops. Swedish scientists apply to NFR and Chinese scientists to NSFC. Applications in Sweden can be sent in any time of the year, but at least 5 months ahead of any proposed activity.
Poland	NFR has an agreement with The State Committee for Scientific Research of Poland (KBN). Applications in Sweden can be sent in any time of the year, but at least 5 months in advance. Swedish scientists apply to NFR and Polish to KBN.
Taiwan	An agreement with National Science Council in Taipei (NSC). Applications in Sweden can be sent any time of the year, but at least 5 months in advance. Scientists apply to the coordinating body in their home country.
Russia	An agreement with the Russian Foundation for Basic Research (RFBR). The agreement includes research cooperation, an exchange of scientists and workshops. There are no special funds, however one conference was funded in Sweden costing 500 000 SEK. The Swedish scientists have to apply to NFR, the Russian scientists apply to RFBR.

Source: Swedish Natural Science Research Council (NFR)

As stated earlier, none of the NFR agreements were targeted against any particular area of research, that is, other than the general remit of NFR for the Natural Sciences. Given that there is no overarching body for the coordination of bilateral efforts, any agreements are designed to meet short term strategic needs (e.g. where Swedish expertise in an area may need to be developed) but are left ‘open’ to enable other work within the field of Natural Sciences. It may be indicative of the level of strategic thinking behind agreements that some produced no activity, e.g. that between Germany and Sweden. In other cases (e.g. Australia) it has been suggested that the difficulty in obtaining funding from the respective agencies has meant that no activity has taken place. In the past there have been agreements with other EU countries, for example France and Germany. Some of these have been in place for as long as 20 years (France). However, as Sweden has increased its participation in EU collaborative research projects, these agreements became less important, and have (by mutual consent) been closed.

14.3.2 Medical Science Research Council (MFR)

The Swedish Medical Research Council has just two intergovernmental agreements, with France (INSERM) and the Netherlands (NWO).

Both agreements allow separate research teams in each country to apply in parallel to get funding for their own costs in a collaborative project. Applications are reviewed separately by the agencies. This is then followed by a telephone conference to reach a final decision. The costs involved are usually modest – mostly for travel. People already collaborating with each other in an EU project are ineligible for support.

As with NFR, until recently there existed longstanding bilateral agreements with Italy, UK and USA, mainly involving researcher exchanges and small conferences. Over time these became less of a priority (again partly due to increased participation in EU collaborative programmes). It is suggested that the agreement with Italy may be resurrected – but as yet there has been no decision as to the conditions under which this may happen.

Exhibit 47 Swedish bilateral R&D agreements, sponsored by MFR (as at June 2000)

Partner Country	Description of Agreement
France	The agreement with INSERM was set up in June 1998, and is a one-year agreement reviewed on an annual basis. To date, the agreement has been renewed each year, automatically. Though some aspects of the agreement (and the activity that occurs as a result) have been reviewed, this has been somewhat arbitrary. However, the general view is that the agreement is beneficial.
Netherlands	The agreement with NWO was set up in October 1997. The agreement lasts for three years (end of 2000) at which time it will be reviewed, and a decision taken on whether it should be renewed. In 1999 the budget for Swedish participation was 278,000 SEK, with an 'indicative maximum' grant of 60,000 SEK per application. There is no specific sector targeted – other than medicine.

Source: Medical Science Research Council (MFR)

14.3.3 KFB

KFB has very little bilateral cooperation, although the trend may be to increase it in the future – e.g. with France and the French national transport R&D programme, PREDIT.

Exhibit 48 Swedish bilateral R&D agreements, sponsored by KFB (as at June 2000)

Partner Country	Description of Agreement
Baltic States	KFB has some small Baltic cooperation projects, where Swedish money flows in a targeted way to develop research milieux in the Baltic neighbour states – third parties suggest that these may be bilateral agreements but we do not yet have concrete information on these.
France	Collaborative activities with PREDIT, the organisation responsible for transport research in France, have led to discussions about the feasibility of a more formalised agreement. This is likely to facilitate researcher exchange and joint meeting etc. – but no firm decision as yet.

Source: KFB, June 2000

Rather than undertake bilateral agreements, to date KFB has preferred to make use of its Scientific Council. These are four leading peers in its research fields. It is felt that this mechanism provides KFB with better access to research and administrative networks.

15 UK

15.1 Introduction

In the UK, the majority of bilateral R&D agreements are administered by:

- The UK government, as represented by the Foreign and Commonwealth Office (FCO) in conjunction with the Office of Science and Technology (OST), currently holds 56 bilateral R&D agreements with other governments. These high level agreements are mostly general in nature, but a few have specific goals. With a few exceptions, no dedicated budgets are associated with the agreements
- Research Councils: non-departmental public bodies under the statutory control of the Office of Science and Technology within the Department of Trade and Industry. They support research, study and training in universities and other higher education institutions, their own institutions and international research centres. Some central government departments also have direct involvement

All national Research Councils maintain some bilateral R&D agreements except the Council for the Central Laboratory of the Research Councils, which administers a number of large-scale facilities including the Rutherford Appleton Laboratory in Oxfordshire and the Daresbury Laboratory in Cheshire.

There are other bodies that promote international relations, and at least part of whose activity is concerned with support for science and technology. The most important under are the Royal Society (a learned society for the promotion of science), the Royal Academy (the counterpart of the Royal Society in the field of arts and humanities) and the British Council (the UK's international organisation for educational and cultural relations). For completeness, the relevant activities of these bodies are described in this report, but the status of their bilateral agreements is best considered separately from the more formal arrangements entered into by Government and the Research Councils.

15.2 Geographical Distribution of Agreements

Exhibit 49 shows the geographical spread of the 56 agreements currently in place.

Exhibit 49 Regional distribution of UK intergovernmental bilateral R&D agreements, June 2000

EU	Rest of Europe (including former USSR)	Rest of the World
Belgium	Albania	Argentina
Greece	Armenia	Brazil
Sweden	Azerbaijan	China
	Belarus	Cuba
	Bulgaria (3)	Egypt
	Croatia	India
	Czech Republic (3)	Indonesia (3)
	Estonia	Iraq
	Georgia	Japan
	Hungary (2)	Korea (2)
	Latvia	Mexico
	Lithuania	Mongolia (2)
	Kazakhstan	South Africa
	Kyrgystan	USA (4)
	Poland (3)	
	Rumania (2)	
	Russian Federation (2)	
	Slovenia	
	Turkmenistan	
	Ukraine (2)	
	Uzbekistan	
	Yugoslavia	

Source: Technopolis, compiled from various governmental sources

Most of these are 'goodwill' agreements, designed to 'encourage and develop cooperation in the fields of applied science and technology between the two countries on a basis of mutual benefit'. Many of the agreements list fields where cooperation is to be encouraged, but these are very wide-ranging, seeming to include most areas of applied science and technology. Types of research cooperation encouraged include visits of experts, provision of facilities, and exchanges of scientific and technical information. Agreements with strategic aims are:

- Korea: Establishment of an Institute of Technology
- Ukraine: Transfer of a British Antarctic Survey Research Station
- USA: Establishment of Space Tracking Stations in Zanzibar and Bermuda

15.3 Biotechnology and Biological Sciences Research Council (BBSRC)

The work of BBSRC's International Relations Unit (IRU) has three main aims:

- Policy - to influence international (especially European) science policy, programme content and funding patterns to the benefit of BBSRC science;
- Funding Opportunities - to facilitate access to funding for the BBSRC scientific community by identifying, promoting and disseminating information on opportunities for international collaboration;
- Networking - to foster strategic collaborative links between researchers in different countries to mutual benefit.

The work of IRU also contributes to wider UK objectives to increase international awareness of the quality and breadth of UK science and the capabilities of its scientific institutions.

BBSRC works with its counterpart organisations overseas and also through the OST (Office of Science and Technology), FCO (Foreign and Commonwealth Office) and British Council to promote scientific interactions. Where relations are aided by formal agreements, BBSRC has signed memoranda of understanding. Those currently in force are with:

- France: Institut National de la Recherche Agronomique (INRA);
- The Netherlands: Dienst Landbouwkundig Onderzoek (DLO);
- Japan: Ministry of Education, Science and Culture (Monbusho); and
- Agriculture, Food and Fisheries Research Council (AFFRC);
- Korea : Korean Science and Engineering Foundation (KOSEF); and Korean
- Research Institute for Biotechnology (KRIBB)
- USA : US Department of Agriculture (USDA);
- India: Council for Scientific and Industrial Research (CSIR) and
- Department for Biotechnology (DBT)
- Canada: Agriculture and Agri-Food Canada (AAFC)

In addition, an agreement is currently being negotiated with the Chinese Academy of Sciences. These agreements tend to be operated in a flexible manner, with no ring-fenced budgets or specific themes. The overall strategic aim is to seek to increase the level of interaction where possible. The formalisation of an agreement is often at the instigation of the overseas body - this is particularly true of Far Eastern partners.

The degree of activity associated with these agreements varies considerably. Those with France and the Netherlands have historically been very strong and have led to a healthy relationship which forms the basis for many successful consortia bids for funding from the EU Framework Programme. BBSRC provides support mainly in the form of finance for travel, project co-ordination costs and workshops. Regular meetings also take place with the Japanese and the North American partners and a number of workshops have recently taken place. For example USDA - Plant Genome Databases, Food and Nutrition. Canada - Environmental Biotechnology, Food Safety. Japan - Bioremediation (a return mission will be funded in 2001). However, little joint working has taken place under the agreements with India and Korea although efforts are being made to remedy this and workshops on Biomolecular Sciences, Natural Products and Animal Health are under consideration.

15.4 Economic and Social Research Council (ESRC)

ESRC strongly believes that research in the social sciences flourishes in an open and internationalist perspective, when it is ready to derive lessons from comparisons across countries and cultures and from the best current contributions to social science, whatever their provenance. The best of British social science has always been carried on within such a perspective. Across Europe and world-wide there are social scientists with expertise and knowledge beyond that held by British experts.

The Council has therefore affirmed its support for a broad and comprehensively internationalist approach in all the research it supports, while retaining a strong orientation towards promoting its own Thematic Priorities. Where appropriate, this internationalist approach should extend to dissemination and communication of findings.

On issues of science policy, the Council's approach is more focused. While seeking to encourage the broadly internationalist approach, a particular task is to maximise the resources and opportunities for funding for social science research carried out in, or from, the UK. Hence, priority is given to the fostering of strong relationships within Europe, and especially within the European Union, where the Framework Programmes are a particular focus.

In recent years, efforts to develop bilateral links at the level of research programme and individual research centres with other European research funders have met with mixed success. Bilateral agreements currently in force are with:

- France: CNRS
- Japan: Japanese Society for the Promotion of Science

The collaborative work with CNRS (France) is for projects being carried out in Research Centres.

Japan has been a priority of the OST for a number of years and it has attached increasing importance to strengthening scientific collaboration. The Japanese Society for the Promotion of Science, too, is keen to develop stronger links. ESRC has agreed with JSPS to support collaborative work between Research Centres on science policy and innovation in the first instance; future collaboration is expected to take place on the topic of ageing. The rapid development of the other Asian economies, particularly China, presents important new opportunities for research to which ESRC is alert. ESRC is a partner in the British Academy's China Exchange Scheme and contributes modest funds to assist social scientists who wish to visit and study in China.

In addition, a jointly supported seminar series (with sister organisations in Denmark, Finland, Norway and Sweden) on the "Public understanding of science", labour markets, and information technologies are taking place. It is hoped that these will lead to further cooperation including areas of science policy, particularly with regard to the EU.

Regarding collaboration with North America, there is a great deal of experience in American funding agencies of measuring and characterising social science research which could be valuable to ESRC. However, a policy review concluded that developing formal links with such organisations in the US is likely to be highly resource intensive, with uncertain results. ESRC will therefore continue to maintain only a watching brief over developments there. More generally, the Council has not attempted to promote formal links, taking the view that UK academics are likely to be pursuing contact with the scientific community in the US without external support.

15.5 Engineering and Physical Sciences Research Council

International cooperation is a central tenet of EPSRC policy. The Council considers it essential for the maintenance of a healthy UK Engineering base to support lasting links with international research communities. To that end, all EPSRC programmes can support individual Visiting Fellowships and Overseas Travel Grants.

For the most part, the EPSRC expects to support international cooperation where individual scientists and engineers crystallise demand in a particular proposal and are able to secure support for their study or visit, in competition with all proposals. There are several notable exceptions where the EPSRC adopts a more focused or strategic approach. Those cases include

- Access to unique international laboratories and facilities
- Emerging areas of science and engineering (e.g. applied catalysis or healthcare)
- Geographical regions where the UK central government has a particular wish to cement international relations, for economic and scientific reasons (e.g. China, South Africa and the US)

International Cooperation Mechanisms

Bilateral R&D agreements are one of several formal mechanisms used by the EPSRC to support international scientific collaboration. Other forms of cooperative mechanism (formal and ad hoc) include:

- **Multilateral R&D agreements.** EPSRC is the UK member of two inter-governmental facilities: the Institute Laue-Langevin (ILL) and the European Synchrotron Radiation Facility (ESRF), both in Grenoble. These international agreements provide EPSRC researchers with access to leading laboratories, which complement the central facilities based at UK Universities
- **Membership of the European scientific and science policy networks** like the European Science Foundation (ESF) and the EUROHORC network (European Union Research Organisations Heads of Research Councils)
- **Ad hoc international collaboration** between UK universities/institutes and their counterparts overseas, which is sponsored and managed within EPSRC's thematic programmes

EPSRC policy is to make R&D agreements at the lowest level possible, taking account of the scale and complexity of the envisaged relationship. So ideally, cooperation operates between individual scientists. In some cases however, it is necessary to forge inter-agency alliances or even inter-governmental agreements.

The EPSRC operates three types of bilateral R&D agreement

- Goodwill agreements, which provide 'permission' within which scientists and engineers can cooperate. These tend to be non-specific in scientific terms and are motivated in large part by the legal requirements of the other country. Most countries in the Far East require a formal agreement to be in place before they will sanction/sponsor scientific collaboration with foreigners

- Mutual interest agreements, which bring together key institutes and research groups to cooperate in strategic areas of science and technology where they have common and or complementary interests
- Facility access agreements, which encourage UK scientists and engineers to become actively involved in theoretical and experimental work connected to the instruments and machines of particular central facilities

The motivation for the creation of an inter-governmental or inter-administration R&D agreement varies from scientific efficiency (facility access) to synergy (semiconductors) to international relations and trade.

The EPSRC's agreement with the Chinese Ministry of Science and Technology (MOST) is typical of a Goodwill Agreement, motivated by wider economic and political interests. During a visit to China in 1998, the UK Minister of Science agreed with his Chinese counterparts to explore ways to increase cooperation between the two countries' scientific communities. Advanced manufacturing and biotechnology were identified as strategic topics where there was a common interest. As a direct result, the EPSRC sent a delegation to China in 1999 to establish where and how their scientific and engineering communities might cooperate in the future.

The delegation concluded that sustained scientific collaboration between the UK and China would be best nurtured at the level of the individual scientists. However, it was agreed that scientists keen to make contact and collaborate must be provided with an appropriate infrastructure/environment. There was deemed to be a real risk that cooperation would become more difficult if the early exchanges did not lead to positive results. The urgency of the need to improve links was underlined by the recognition that the UK's competitors in Europe and elsewhere are seeking to establish formal collaborative arrangements with China through joint laboratories and bilateral scientific agreements.

Strengths and weakness of Bilateral R&D agreements might include:

- Formal agreements add complexity and bureaucracy and can dissuade scientific communities from working together.
- The diversity among countries in the organisation of their respective public sector research systems – and science policy – poses some problems. China for example does not view Intellectual Property issues in the same way as would be typical in the UK. Similarly, the Korean and Japanese governments are unfamiliar with the EPSRC's requirement for bilateral R&D agreements that do not have ring-fenced budgets.

Exhibit 50 EPSRC Bilateral R&D Agreements

Administration	Country	Level of agreement	Type of agreement	Subject	Cooperation	UK Funding	Start date	Review period
Ministry of Education Science and Culture (Monbusho)	Japan	Inter-government	Goodwill	Open	Joint research N+N seminars Visiting fellowships Exchange of information	No separate budget	1993	3 years
Korean science and engineering foundation (KOSEF)	Korea	Inter-administration	Goodwill	Open	Joint research N+N seminars Visiting fellowships Exchange of information	No separate budget	1994	3 years
Ministry of Science and Technology (MOST)	China	Inter-government	Goodwill	Open		No separate budget	1978	
National Natural Science Foundation of China (NNSFC)	China	Inter-administration	Goodwill	Open		No separate budget	Under negotiation	N/a
Japan Society for the Promotion of Science (JSPS)	Japan	Inter-administration	Mutual interest	Semiconductors	Joint research between particular institutes Scientific exchange Postdoctoral fellowships	No separate budget		
National Science Foundation (NSF)	USA	Inter-administration	Mutual interest	High-Perform. Computing		No separate budget	Under negotiation	N/a
National centre for scientific research (CNRS)	France	Inter-administration	Facility access	Chemistry		No separate budget		
The Netherlands Organisation for Scientific Research (NWO)	The Netherlands	Inter-administration	Facility access			No separate budget		
The Australian National University (ANU)	Australia	Administration-international laboratory	Facility access	Nuclear physics	Instrument development and experiments using ANU accelerators	No separate budget	1993	4 yearly

15.5.1 Management of Bilateral R&D Agreements

The EPSRC International Group is responsible for the negotiation and management of formal agreements with national research administrations and funding agencies in other countries.

The EPSRC uses its normal grant mechanisms to support international collaboration; there are no special budgets set aside. Support for any bilateral proposal will be assessed on standard evaluation criteria and will have to compete for funding against wholly domestic proposals and other international submissions.

The following paragraphs list the main forms of international cooperation, which typify bilateral R&D collaboration:

- Bilateral research projects. This is collaborative research. The UK lead partner must submit a standard research grant proposal to the relevant scientific or thematic programme. Eligible costs include all project-related expenditure incurred by the UK universities/institutes and travel funds for foreign partners visiting the UK
- Bilateral research workshops (N+N seminars). These meetings are intended to exchange ideas and explore the possibility of more substantial future collaboration. Roughly equal numbers attend from each side, hence these bilateral workshops are often known as N + N meetings. EPSRC will fund travel and accommodation expenses of UK participants and, for meetings in the UK, core meeting costs. The foreign participants are expected to secure financial support from their national research administration. It is preferred that a single UK participant co-ordinates the UK side and submits a single standard research grant proposal to cover all the UK side's costs
- Overseas Travel Grants (OTG). UK researchers can submit a standard research grant proposal – to recoup travel and subsistence costs for themselves and members of their research teams – to undertake a research-oriented visit to a leading research group overseas. OTGs are not for attendance at Conferences or similar meetings
- Visiting Fellowships (VF). Visiting Fellowship proposals can be submitted by UK academics for the travel and subsistence support of leading overseas researchers to visit a UK university for a period of up to one year

15.6 Particle Physics and Astronomy Research Council (PPARC)

PPARC's objectives are to support basic research in astronomy, planetary science and particle physics, to train scientists and engineers, to increase the competitiveness of UK industry, to attract future generations of scientists and engineers and to stimulate the interest of the public. Its principal activities are to support large-scale multilateral research facilities (notably CERN, ESA and ground based astronomy facilities), and to provide grants for research undertaken in UK universities, including support for postgraduate students and research fellows.

International collaboration is extensive. Joint ventures exist with the USA, Canada, Australia, and several EU countries. These may be formal agreements between

PPARC and partner agencies, or informal arrangements drawn up independently between individual UK research establishments funded by PPARC and its overseas counterparts, where higher-level umbrella agreements are not required. High-level enabling agreements comprising expressions of interest in collaboration are, however, generally required by far-eastern countries; there is also one with South Africa on telescope access reflecting the long history of collaboration.

Many of these agreements are multilateral, however, PPARC's programme of ground-based astronomical facilities⁴⁰, which allows the UK community access to telescopes operating within all wavelengths readily accessible from the ground, includes a typical bilateral agreement.

The Isaac Newton Group (ING) of telescopes is based at the Observatorio del Roque de los Muchachos, La Palma, in the Canary Islands, Spain. The group consists of the 4.2 metre William Herschel Telescope (WHT) the 2.5 metre Isaac Newton Telescope (INT) and the 1 metre Jacobus Kapteyn Telescope (JKT). The telescopes are operated by the ING on behalf of the UK and the Netherlands scientific communities, represented by the national funding agencies PPARC and the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) respectively. An ING Board oversees the programme of operation, maintenance, and development of the installations, approves annual budgets and forward estimates and determines the arrangements for the allocation of observing time. The UK has an 80% share of available observing time and the Netherlands 20%. For the JKT only, further international agreements allow astronomers from Eire 27 nights per year, Portugal 28 nights per year.

Other initiatives currently in place under such bilateral agreements are:

- Japan: Collaboration between the Mullard Space Science Laboratory and the Institute of Space and Astronautical Sciences, Japan, involving the development of satellite instrumentation (£4m)
- Korea: Discussions on possible joint seminars (N+N meetings) with the Korean Science and Engineering Foundation in astronomy and space science.

In addition, PPARC is encouraging the Chinese in their plans to build a new radio telescope, and a collaboration agreement has been signed between Beijing Observatory and Jodrell Bank. In this case there is an inter-governmental agreement on cooperation, but not (yet) a PPARC agreement, although one is being contemplated with the Chinese Academy.

High-level enabling agreements do not have dedicated budgets associated with them – work proposed under the auspices of such agreements is evaluated and, if considered appropriate, funded according to the same criteria as other proposals submitted to PPARC.

15.7 Natural Environment Research Council (NERC)

NERC supports research on the natural environment, carried out in its own institutions, and in universities and other bodies. Its stated objectives are:

⁴⁰ A facility is defined by PPARC as one that offers open access to the UK research community through peer-reviewed research programmes.

- to promote and support, by any means, high quality basic, strategic and applied research, survey, long-term environmental monitoring and related postgraduate training in terrestrial, marine and freshwater biology and Earth, atmospheric, hydrological, oceanographic and polar sciences and Earth observation;
- to advance knowledge and technology, and to provide services and trained scientists and engineers, which meet the needs of users and beneficiaries (including the agricultural, construction, fishing, forestry, hydrocarbons, minerals, process, remote sensing, water and other industries), thereby contributing to the economic competitiveness of the United Kingdom, the effectiveness of public services and policy and the quality of life;
- to provide advice on, disseminate knowledge and promote public understanding of the fields aforesaid.

Environmental research is a major focus for current and proposed international cooperation and the NERC maintains extensive international links, with international bodies, analogous scientific administrations, international surveys and so on. The majority of links are multilateral and occur at the level of individual projects or institutions. The NERC has two bilateral R&D agreements. The first is a strategic agreement with the French national research institute for the exploitation of the sea (IFREMER) to coordinate the provision and operation of both countries major naval equipment. The second is a goodwill agreement between the British Geological Survey (NERC) and the Chinese Natural Research Council; the Chinese favour formal arrangements.

15.8 Other Institutions

15.8.1 The Royal Society

The Royal Society is a prestigious learned society in the UK, existing to promote research and education in science and technology nationally and internationally. The Society's international programme provides grants for scientific research visits to and from the UK. The following types of grant are available:

Study visit grants, for short-term visits (up to three months) - 256 (588) awards from (to) the UK in 1997-98, involving 115 (107) countries

Fellowship grants, to enable young scientists to carry out research abroad for up to two years. Fellowships are available under a variety of schemes operated in association with other bodies, including the Foreign and Commonwealth Office, large UK companies and Japanese agencies. There were 48 (182) fellowships from (to) the UK in 1997-98, involving 36 (7) countries

Joint Project grants, providing funding for 2-3 years for exchange visits in connection with bilateral research collaboration between a UK and overseas research group. There were 153 awards involving 51 countries in 1997-98.

The Joint Projects are similar to the British Council's Joint Research Projects (see below). In 1998-99, Joint Project Awards were made, 272 Joint Projects were in progress, and the budget was £1.06m (EA Report).

15.8.2 British Council

The British Council is the UK's international organisation for educational and cultural relations. With science or science qualified posts in over thirty countries, the Council has a key role in promoting overseas links with the UK science community, and its resources and products, including S&T policy, education and the public understanding of science, research training, research links and consultancy capability. It works in partnership with a wide range of UK organisations, including universities, the research councils, government departments, non-governmental organisations and a wide variety of other public and private sector organisations.

The Council, with offices in 110 countries, promotes a wider knowledge of the English language, and encourages cultural, scientific, technological and educational cooperation between the UK and other countries. Initiatives overseas cover a wide variety co-funded science activities which contribute to a better understanding of the UK's capabilities, to sharing experiences in policy and practice and to the longer-term benefits of establishing partnerships between UK and overseas institutes and individual scientists.

Of particular interest here are the Council's Joint Research Programmes, developed to promote links and contacts between British and other European higher education institutions, research institutions and laboratories. Financial support is provided to contribute to fares and subsistence for exploratory and bilateral visits of specialists, for approved projects of up to three years' duration.

The schemes were begun in 1983, but most were initiated in the 1990s. There are 23 schemes in all in 21 countries, most foreign partners being government departments or research councils, with some universities and academies (three each). The total annual budget is currently about £1.8m, with funding generally, but by no means exclusively, on a 50-50 basis with the partner. All schemes cover medical, biological, physical and engineering sciences, while some also include social sciences, arts and humanities. Schemes support between 4 and 120 projects per year, with around 680 new projects being funded each year. The average project grant is about £4,400.

16 Japan

16.1 Introduction

Information on national bilateral agreements is limited to an annual White Paper by the S&T Policy Bureau at the Science and Technology Agency. The information below is based on the 2000 edition of the White Paper ("Kagakugijitsu Hakusho: Heisei 12-nen", August 21, 2000), which indicates that agreements are in force with 22 countries.

16.2 Geographical Distribution of the Agreements

The table below shows the partner countries involved in current agreements.

EU	Other Europe	Rest of the World
Germany	Yugoslavia	Australia
Finland	Poland	Canada
Netherlands	Czech Republic	South Korea
Sweden	Bulgaria	USA
Italy	Hungary	China
France	Rumania	India
UK	Slovakia	Brazil
		Israel
		Russia

No explicit S&T agreements exist with the EU as a whole, or with Norway or Switzerland, but "discussions" are held within the framework of trade talks (Norway), the S&T round table (Switzerland), and the S&T Forum (EU). A cooperation agreement with France was renegotiated in 1991.

A bilateral agreement with the former Soviet Union was concluded in 1973, and an agreement on space cooperation with Russia in 1993. At the occasion of Putin's visit to Japan in early September this year, a bilateral agreement with Russia was concluded. Japan had also concluded bilateral agreements ("kyotei") with the former Yugoslavia and Poland, as well as less formal cooperation agreements ("tori-kime") with Czechoslovakia, Bulgaria, Hungary, and Rumania. Of all these agreements with Eastern European countries, only the agreements with Hungary, Poland, Rumania, and Bulgaria were active in 2000.

Japan does not have agreements with many Asian countries, such as Thailand and Malaysia, nor with countries from the Mid-East (with the exception of Israel). In the framework of trade agreements, Japan is presently in discussions with Saudi Arabia on S&T cooperation.

Bilateral agreements at the country level are by no means a prerequisite for agreements nor for actual collaboration, or for Japanese financial contributions to existing collaborations at a lower (agency, institute, laboratory) level. In fact, there are many examples of existing collaborations, especially between Japan and

developing countries in East Asia, where no such bilateral agreements exist at the country level. This applies particularly to the cases of Thailand and Malaysia, where several Japanese funding agencies have regional offices.

Also, according to international cooperation officers at various government research centres, lower-level cooperation agreements are frequently concluded independently of any cooperation agreement at the country level. However, if there are significant amounts of funding involved, there is a certain preference - especially with officials at central government agencies - for collaborative agreements under an existing 'umbrella agreement'. However, a review of cooperation agreements at three research institutes (one national research centre and two slightly more autonomous 'tokushu hojin' organizations), and at two major funding agencies (JSPS and JST) does not seem to support the hypothesis that agency/institute level bilateral agreements are following patterns of bilateral agreements at the country level.

A director of a national research centre argued that the existence or otherwise of a bilateral agreement at the country level was not an issue of concern when signing a formal cooperation agreement. However, it is clear that more analysis would be necessary to determine whether funding for international collaborations are tied to bilateral agreements.

16.3 The Policy Context

By any definition, the US remains the most important cooperation partner for Japan. The cooperation agreement with the US tends to be more complex and detailed than with other countries. The Japan-US bilateral agreement includes a preamble on "fair access", with a corresponding sub-committee (TFA), which appears to be unique to the US-Japan agreement. An indication of the importance of the US is provided by the S&T White Paper, which has two pages on Japan-US cooperation, one page on selected individual European countries and less than a sentence on the EU.

As the above list reveals, bilateral agreements are highly political. Perhaps with the exception of the US, which has a long-standing and complex history of cooperation with, and technology-transfer to, Japan, bilateral agreements on S&T rarely reflect specific strategic intentions, but rather reflect more broadly foreign policy 'needs'. Government officials point out that bilateral agreements on S&T cooperation are the easiest and usually least conflictual to conclude and provide a bridgehead for more extensive and wide-ranging cooperation. The agreement between Japan and China of 1980 and the series of agreements with the former Soviet Union and Russia are cited as illustrations of the role that S&T agreements can play in underpinning a breakthrough in international relations.

Japan's foreign policy towards industrialised nations has been more re-active than pro-active. This fact, together with the decline of an industrial policy component in S&T cooperation agreements generally between Japan and other industrialised countries, leaves little strategic quality to Japanese S&T cooperation. A senior government official (and present co-chair of the OECD Global Science Forum) suggested in an interview 'that there is little strategy to Japan's S&T cooperation, certainly not in the sense the term is used in the West'. Statements by responsible officials on international cooperation at the Japan Science and Technology

Cooperation and the Japan Society for the Promotion of Science, two important funding agencies involved in international cooperation, confirmed this opinion. It was also suggested that bilateral agreements at the country level (and possibly also at the institute level) were intentionally kept fairly broad and unspecific.

Most science related agencies in Japan (with the exception of the Ministry of International Trade and Industry, which, through JETRO, has a worldwide network to its disposal) are strictly domestic and lack international experience. Over the past few years there have been efforts to change this situation. Major funding agencies, notably JSPS, NEDO, and JST are now running offices in London and Washington, as well as in several Asian countries. However, foreign policy is still clearly a domain of the Foreign Ministry. Perhaps because of the re-active nature of Japan's foreign policy, and also perhaps because of a lack of S&T competency of the Japanese Foreign Ministry, there seems to be a preference for pursuing activities through international organisations or multilateral bodies. This is not the case necessarily with regard to the European Union; Japanese officials say they have found it difficult to identify the 'right' approach towards cooperation with the European Union.

16.4 Factors Influencing Bilateral S&T Agreements

The following is an attempt to identify factors that crucially influence the Japanese approach towards bilateral cooperation agreements. In most cases, the domestic policy context is crucial. Even in the context of international cooperation, Japanese government agencies expend more time and effort on dealing with each other than on dealing with the foreign partner. "Strategy" issues in international cooperation in Japan are usually of a domestic nature. This is true beyond collaboration in S&T (examples are GMO regulation and the Japanese 'joint implementation' programme). The following provides some clues why this is so.

16.4.1 History

Japan's track record of successful international R&D cooperation is limited; as is the number of cooperation projects that had been initiated by Japan, or by Japanese scientists. Bringing a large international cooperation project to Japan has proved rather difficult to do.

More generally, the internationalisation of Japan's national research system has been a fairly restricted and one-sided affair. Despite a large number of short-term scholarships and opportunities, the number of foreign scientists from industrialised countries remains fairly low. Although the number of students from Asian countries has been increasing rapidly, the percentage of western foreigners at Japanese national universities is low; there is perhaps not a single full professorship at a large national university occupied by a Western scientist.

In addition, there are a number of historical examples of failure in international cooperation, such as the coal liquefaction project pursued on a trilateral basis by Japan, Germany, and the United States. Although both the US and Germany pushed Japanese officials, both nations departed from the project relatively soon after its inception – leaving Japan with a facility but without cooperation partners. This

experience seems to have had a lasting impact on cooperative behaviour and on the mindset of Japanese science administrators.

The Human Frontier Science Programme (HFSP) was identified by one interviewee as another crucial influence on cooperation programmes (if not necessarily bilateral ones). A small, but relatively successful programme, HFSP remains almost exclusively financed by Japan - despite its initial design as a multilateral cooperation programme. HFSP has not only demonstrated that Japan-led international cooperation programmes can be successful, but has also made it clear that Japan can do so 'on her own'. It appears that more energy was put into solving domestic leadership issues (between STA and MITI) than in efforts to make the project into a truly international one. One implication of HFSP has been an increasing tendency towards one-sided collaboration initiatives, where virtually all costs are covered by Japan. This is true for several existing schemes that support cooperative research as well as for scholarships or fellowships for Japanese researchers, especially at prestigious US universities. Other examples include the research centre sponsored by the Research Institute of Physical and Chemical Research (RIKEN) at Brookhaven National Laboratory, Rutherford-Appleton Laboratory, and MIT (in the latter case the beneficiary is a Japanese Nobel-prize winning neuroscientist).

16.4.2 The Budget Cycle

Budget formation is the dominating process within the Japanese central government. There is practically no activity of a central government agency that is not influenced by the budget cycle. Following the setting of ministry level ceilings (usually in June), ministries and agencies enter a period of intense negotiations with the finance ministry as well as with their 'clients'. Detailed budget requests are filed to the Ministry of Finance by the end of August. The MoF then prepares a detailed budget proposal that is handed to the Diet, the Japanese parliament. Except for projects that are intimately linked to political constituencies (like large construction projects), the parliament has relatively little influence on the budget process. However, individual Diet members play an important role in facilitating interaction between agencies and the MoF. The level of detail of budget proposal is surprising and leaves agencies with very little space to act or to deal with emergencies. What is perhaps more important is that agencies need to obtain permission for almost any activity from the Finance Ministry.

The implications for bilateral collaborations in S&T are twofold:

- Agencies usually need about a year to process even small amounts of funding
- As soon as there is any significant funding involved, agencies have to deal with the MoF, which can be complicated and time consuming.

Although not a formal requirement, existing bilateral agreements are often mobilised in support for a specific budget request, providing additional credibility. Yet another element that must not be underestimated, and that relates to remarks made earlier about Japan's foreign policy approach, concerns the often fairly limited international experience and exposure of government officials within the national bureaucracy. Most agencies have practically no mid-career staff and little possibility for providing agency officials with international exposure. The most common, although rare,

international experience for career staff at the Science and Technology is a government financed graduate degree at a US university. The other possibility is an experience at a foreign embassy or, on the case of MITI career staff, a position with JETRO. However, Japanese embassies have very few 'science councillor' positions and, again, the main focus is on the US rather than Europe. It seems there is little career agency staff at the JSPS and JST offices in London and Washington, with personnel typically coming from the agencies themselves rather than from the central government.

16.4.3 The Domestic Policy Context

In addition to the finance ministry, for cooperation agreements over a certain size agencies have also to deal with the foreign ministry, adding yet another layer of complexity. As mentioned, conflicts over the lead in an international cooperation project between agencies (typically STA and MITI) are frequent, and it is usually within the domestic policy context - rather than the international one - where the most harsh conflicts occur and where agendas are played off. In other words, there are typically three government agencies involved in any cooperation effort, and often more than that. In such an environment, the success of an international collaboration project depends on the political network and clientele that the project leader or official can mobilise. An implication for partner countries negotiating cooperation agreements with Japan is the need to carefully evaluate the specific position and political network of the project leader or responsible official at the Japanese side.

17 USA

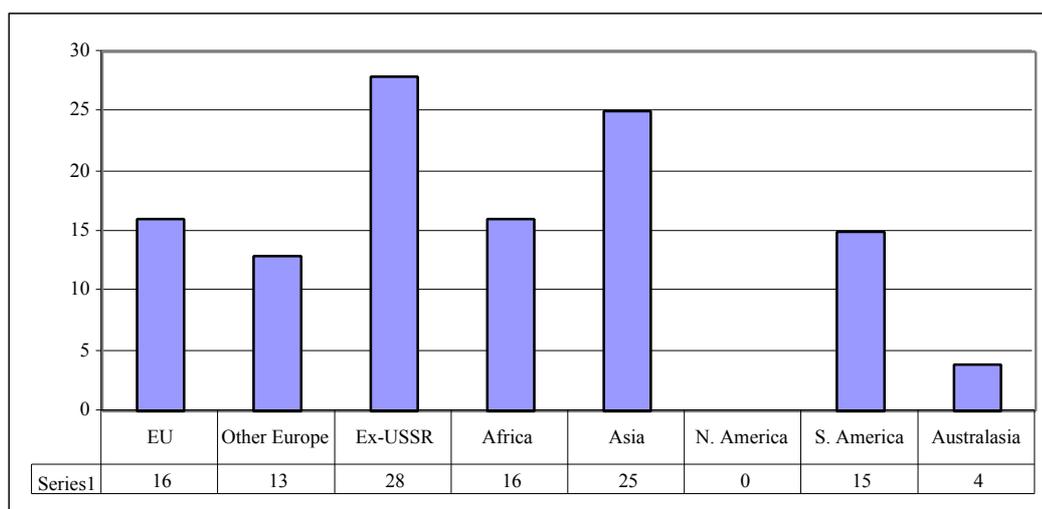
17.1 Introduction

The USA has around 830 bilateral R&D agreements in total of which 117 are government-to-government agreements and 710 are agency-to-agency agreements. The intergovernmental agreements are monitored by the US Bureau of Oceans and International Environmental and Scientific Affairs, which can provide, for each agreement, data on partner country, US agency responsible, subject, start and end dates, funding, and short description. There are no consolidated data for the agency level agreements and hence we focus on the intergovernmental agreements.

17.2 Geographical distribution of Agreements

Exhibit 51 shows the broad geographical distribution of the bilateral agreements.

Exhibit 51 Distribution of US bilateral R&D agreements by numbers of agreement and region for agreements current in 2000



Source: Technopolis analysis of data available through the National Science Foundation (NSF)

Compared with the EU as a whole, the high proportion of agreements with the ex-USSR is noteworthy, reflecting improved post-cold-war relations. Despite the geographical proximity, there are no intergovernmental S&T agreements with Canada. But in other respects, particularly the proportion of agreements with Asian, South American, and African countries, the pattern is similar to that of the European Union member states. Apart from the 'special cases' of the ex-USSR and Canada, the implication is that the same forces, such as a political desire to show goodwill or to encourage emerging nations, are operating here.

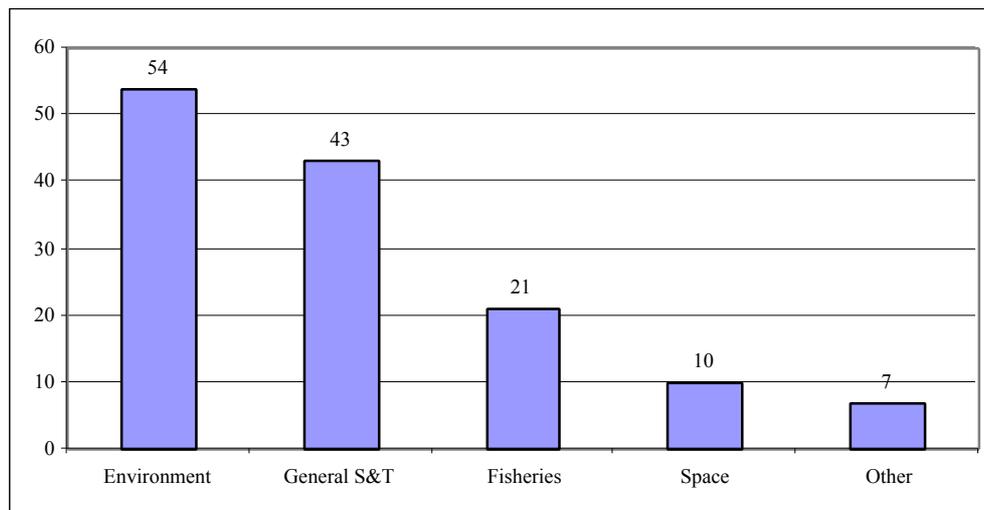
The more detailed pattern within the large geographical blocks is rather different. Among the Asian countries, China (7 agreements) figures prominently, as it does in the EU case; but the Asian partner with whom the USA has the most agreements (8)

is Japan, which does not feature particularly strongly as an EU partner. Among South and Central American countries, Mexico (rather than Brazil) has the largest number (4) of bilateral agreements with the USA. Two of these agreements are explicitly concerned with environmental issues relating the common border between the countries.

17.3 Topic Areas

As indicated below, most of the US intergovernmental agreements fall into one of four topic areas – environment, general science and technology, fisheries, and space.

Exhibit 52 Distribution of US intergovernmental bilateral R&D agreements, by major topic areas (number of agreements current in 2000)



Source: Technopolis analysis of data available through the National Science Foundation (NSF)

All but six of the 54 environmental agreements fall under the GLOBE (Global Learning and Observations to Benefit the Environment) programme, an international environmental science and education programme for F-12 students worldwide. Working under the guidance of GLOBE-trained teachers, GLOBE students make environmental measurements at or near their schools; report their data through INTERNET to a GLOBE data processing facility, receive global images created from worldwide GLOBE school data; and study environmental topics.

Most of the agreements in the 'General S&T' category are umbrella or framework agreements. Some of these are completely general, while others specify the broad kinds of activities covered (such as exchange of scientists and information, joint seminars and joint research projects). Others mention particular issues – for example: intellectual property rights are commonly mentioned.

Most of the fisheries agreements are in fact multilateral, and concern the conservation of marine resources. Agreements in the space area vary from the general (with Israel) to the very specific (with Russia in particular; 4 space agreements with Russia are currently in force).

17.4 Resources Allocated to Agreements

For the great majority of the government -to-government (and, indeed, of the agency -to-agency) agreements, funding levels are not specified. The main areas of bilateral government-to-government cooperation where funding *is* specified are:

- Joint projects with Israel establishing a Bi-National Science Foundation and a Bi-National agricultural R&D foundation (\$11m and \$100m, respectively)
- Umbrella S&T agreements with Egypt, Hungary, Poland, Slovakia, Slovenia and Zimbabwe. Each of these involves a US annual contribution of less than \$2m, normally matched by the partner country in their own currency
- An agreement with Russia in the area of space technology, involving a *Russian* contribution to a space station in excess of \$2 *billion*

18 Annex A - Contributing organisations

The table lists the ministries and scientific administrations that have contributed to the study either through interviews or the provision of written material on their respective bilateral R&D agreements.

Country	Contributing organisations
Austria	ERP, Fonds (infrastructure programme)
Austria	FFF, Forschungsförderungsfonds für die gewerbliche Wirtschaft, Research Fund for Industry
Austria	BMWV, The Bundesministerium für Wissenschaft und Verkehr, Federal Ministry for Science and transport
Belgium	BLEU, Belgian-Luxemburg Economic Union
Belgium	DGTRE, Direction Generale des Technologies, de la Recherche et de l' Energie, DG Technology, Research and Energy of the Ministry of Walloon Region
Belgium	Federal Ministry for Science Policy
Belgium	OSTC, Federal Office for Scientific, Technical and Cultural Affairs
Belgium	Flemish government
Belgium	FNRS, Fonds National de la Recherche Scientifique'
Belgium	FWO, Fonds voor Wetenschappelijk Onderzoek -Vlaanderen, Fund for Scientific Research - Flanders
Belgium	Government of the French Community
Belgium	IWT industrial research and technology transfer (Flemish region)
Belgium	Kingdom of Belgium
Belgium	Ministry of the Flemish Community (Science and Innovation Administration)
Denmark	DNRF, Danish National Research Foundation
Denmark	Danish Research Councils
Denmark	MRIT, Ministry of Research and Information Technology
Finland	AKA, Ajankohtaista Suomen Akatemiass, Academy of Finland
Finland	Ministry of Education
Finland	Ministry of Trade and Industry
Finland	TEKES, Finnish National Technology Agency
France	ANVAR, Agence Française de l'Innovation, French Innovation Agency
France	CNRS, Centre National de la Recherche Scientifique, National Research Council
France	Ministère de l'Education Nationale, de la Recherche et de la Technologie
France	MAE, Ministère des affaires étrangères, Affaires spatiales, réglementation européenne du double usage
France	Cemagref, Agriculture and Environmental Engineering Research centre
France	INRIA, Institut National de Recherche en Informatique et en Automatique, Research Institute in Computer Science and Control
Germany	BMBF, Bundesministerium für Bildung und Forschung, federal Ministry of Education and Research
Germany	BML, Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft
Germany	DAAD, Deutschen Akademischen Austauschdienst, German Academic Exchange Service
Germany	DFG, Deutsch Forschungsgemeinschaft, National Research Council
Germany	Forschungszentrum Jülich, Jülich Research Centre
Germany	Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren, Hermann von Helmholtz Research Centre
Germany	MPG, Max Planck Gesellschaft
Greece	GSRT, General Secretariat of Research and Technology
Ireland	Enterprise Ireland
Ireland	Forfas, National Policy and Advisory Board for Enterprise, Trade, Science, Technology and Innovation

Country	Contributing organisations
Ireland	Office of Science and Technology, Department of Enterprise, Trade and Employment
Ireland	Royal Irish Academy
Ireland	TEAGASC, Irish Agriculture and Food Development Agency
Ireland	HRB - Health Research Board
Italy	MAE, Ministero degli Affari Esteri, Ministry for Foreign Affairs
Italy	CNR, centro Nazionale per le ricerche, National research Council
Italy	MURST, Ministero dell'Universita' e della Ricerca Scientifica e Tecnologica, Ministry of University and S&T Research
Italy	ING, Istituto Nazionale di Geofisica, National Institute of Geophysics
Italy	ENEA, Ente Nazionale Energie Alternative, The Organisation for New Technologies, Energy and the Environment
Italy	INFN, Istituto Nazionale di Fisica Nucleare, National Institute of Nuclear Physics
Italy	ISS, Istituto Superiore della Sanita', Higher Institute of Health
Italy	INFM, Istituto Nazionale di fisica della Materia, National Institute of Physics of Matter in Genoa
Italy	ASI, Agenzia Spaziale Italiana, Italian Space Agency (ASI)
Japan	Japan Atomic Energy Research Institute
Japan	Japan Science and Technology Corporation, International Cooperation Division
Japan	Japan Society for the Promotion of Science, International Cooperation Division
Japan	Institute of Physical and Chemical Research
Japan	Nuclear Fuel Cycle Institute
Japan	National Institute of Informatics
Japan	Agency for Industrial Science and Technology
Japan	National Institute of Science and Technology Policy
Luxembourg	Ministry of Economy
Portugal	AdI, Agência de Inovacao, Innovation Agency
Portugal	ICCTI, Instituto de Cooperacao Cientifica e Tecnologia Internacional, Institute for International Scientific and Technological Co-operation
Portugal	JNCIT - Portuguese Ministry of Science & Technology
Spain	CDTI, Centro para el Desarrollo Tecnológico Industrial, Centre for Industrial Technology development
Spain	CICYT, the Inter-Ministry Commission for Science and Technology
Spain	CSIC, Consejo Superior de Investigaciones Cientificas, National Science Council
Spain	INIA, National Research Council
Spain	MAE - Ministry of Foreign Affairs
Sweden	BFR, Bygghorskningsrådet, Swedish Council for Building Research
Sweden	FRN (Council for Planning and Coordination of Research)
Sweden	KFB (Swedish transport and communications board)
Sweden	MFR (Medical Research Council)
Sweden	Ministry of Education and Science
Sweden	Ministry of Industry & Trade
Sweden	NFR (Natural Sciences Research Council)
Sweden	NUTEK (National Board for Industrial and Technical Development)
Sweden	TFR (Research Council for Engineering Sciences)
Netherlands	KNAW, ,Netherlands Academy of Arts and Science
Netherlands	EZ, Ministry of Economic Affairs
Netherlands	OCW, Ministry of Education, Culture and Science
Netherlands	NOW, Nederlandse Organisatie voor Wetenschappelijk Onderzoek, Netherlands Organization for Scientific Research
UK	BBSRC, Biology and Biological Sciences Research Council
UK	British Council
UK	DfID, Department for International Development
UK	EPSRC, Engineering and Physical Sciences Research Council
UK	ESRC, Economic and Social Research Council
UK	FCO, Foreign and Commonwealth Office
UK	MRC, Medical Research Council

Country	Contributing organisations
UK	NERC, Natural Environment Research Council
UK	OST, Office for Science and Technology, International Directorate
UK	PPARC, Particle Physics and Astronomy Research Council
UK	Royal Society
USA	DOC, Department of Commerce
USA	DOD, Department of Defense
USA	DOE, Department of Energy
USA	DOI, Department of the Interior
USA	DOT, Department of Transportation
USA	EPA, Environmental Protection Agency
USA	HHS, Department of Health and Human Services
USA	NASA, National Aeronautics and Space Administration, Washington
USA	NRC, Nuclear Regulatory Commission
USA	NSF, National Science Foundation
USA	Smithsonian Institution
USA	USDA, United States Department of Agriculture