

**DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY  
COMMITTEE FOR SCIENTIFIC AND TECHNOLOGICAL POLICY**

**Working Party of National Experts on Science and Technology Indicators**

**MEASURING R&D IN RESEARCH INSTITUTIONS**

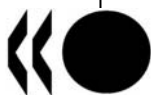
**22 JUNE 2010**

*This paper is presented for discussion under item 9 of the second meeting of the Working Party on Research Institutions and Human Resources (RIHR) held on 22 June 2010 at the OECD headquarters. It presents the results of the NESTI national R&D tabulation contribution to the RIHR project on the transformation of research institutions.*

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## MEASURING R&D IN RESEARCH INSTITUTIONS

### Background

1. In 2008 NESTI agreed to collaborate with the Committee for Scientific and Technological Policy (CSTP) Working Party on Public Research and Human Resources (RIHR, the former SFRI group) on developing indicators on inputs/outcomes/linkages in research institutions [DSTI/EAS/STP/NESTI(2008)30].

2. For R&D statistical collection purposes, research institutions are defined according to their principal activity. With the exception of those administered by the higher education sector, all non-market non-profit institutions controlled by government are included in the government sector.<sup>1</sup> However, there are ‘borderline’ research institutions whose classification in the university, in the government, in the business or non-profit sectors will vary by country. With the transformation of research institutions these classifications have become increasingly blurred. Irrespective of where institutions are classified, irrespective of their nature, once a policy relevant taxonomy has been agreed upon, *i.e.* the target population of interest has been identified, a micro-data extraction from R&D survey data to obtain R&D expenditure and personnel data related to that particular population can be carried out to help follow transformations in these institutions. As a first step in the project, NESTI is asked to help re-tabulate some of the R&D statistics to analyse trends in the population identified by RIHR.

### RIHR work

3. The RIHR project has been divided into various steps. For example, the Secretariat has examined the sector, as traditionally defined, using R&D data and other indicators, and has invited member and observer countries to contribute to a “country context note” on research institutions. See DSTI/STP/RIHR(2009)5 for the full results.

4. That note had the aim of building an overall picture of the number and different types of institutions, the organisation of “public” non-university research systems, and government policies to promote change. It also aimed to build a “new sample” list of entities across countries so further analytical work can be conducted by NESTI.

5. For the purposes of the country context note, the target unit of analysis was research institutions (excluding pure university institutes), defined as: *National entities, irrespective of their legal status (organised under public or private law):*

- *whose primary goals are to conduct fundamental research, industrial research, experimental development, training, consulting and service provision, and to disseminate their results by way of training, publication and technology transfer; and*

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1. OECD (2002), *Frascati Manual*, OECD, Paris.

- *whose profits (if any) are reinvested in these activities, the dissemination of their results, or training; and*
- *which are either totally or to a substantial share publicly owned, and/or are funded primarily from public sources via base funding (block grants) or through contract-based research, and/or are regulated, so as to achieve primarily public missions.*

6. The entity could come from any statistically-defined sector (government, higher education, business or private non-profit). Respondents were also able to include, if relevant for their countries, research performing institutions located in their countries that function under international agreements of international law.

7. The RIHR Secretariat analysed 15 responses to the country context note: Austria, Belgium (Flanders), Canada, Denmark, Finland, Germany, Italy, Japan, Luxembourg, New Zealand, Norway, Poland, United Kingdom, Chile and Russia. The results were discussed at the first RIHR meeting held on 18 and 19 May 2009 [DSTI/STP/RIHR/A(2009)1]. Since then it has received four additional contributions from Australia, Korea, Spain and the European Commission Joint Research Centre, as well as a number of case studies that are presented in document DSTI/STP/RIHR(2010)9.

8. As noted in DSTI/STP/RIHR(2009)5, it is interesting to observe which types of research institutions countries chose to include in their country context notes. Although the definition of research institutions provided for the project sets some boundaries on the types of research institutions included, it does still leave scope for interpretation. Different countries have taken different approaches, reflecting the range and form of institutions that are situated in each country and judgements about the degree of “public mission” and the importance of various institutions in national innovation systems.

9. Given the different patterns that emerged from the context notes, it was noted that it may be useful to discuss further the desired approach to certain types of institution, with a view to consistent coverage in the subsequent data analysis stages of the RIHR project. The re-tabulation of R&D statistical data conducted with the help of NESTI delegates provides some interesting results in this regard and are discussed below.

### **Re-tabulation of R&D statistical data in a few selected countries**

10. A first statistical pilot exercise was organised in Norway with the help of NESTI delegates from NIFU STEP and then extended to a few volunteer countries. It consisted of 1) comparing the list of research institutions provided by the RIHR delegate according to the above new definition with that of the Frascati breakdown of institutions and 2) providing the total expenditure for the newly defined population broken down by sources of funds, types of cost, types of R&D, fields of science and socio-economic objectives as well as total R&D personnel by types of occupation. In doing that, it was also asked from NESTI delegates to show the breakdown of the newly defined population according to the original Frascati sectors.

11. Data requests were sent in September 2009 to countries participating on the NESTI side and responses were received from the following countries: Austria, Denmark, Finland, Luxembourg, Poland and Russia. Data were also received from Belgium, but for Flanders only; these data could therefore not be used in comparison with Frascati data that are for the entire country. Furthermore, the data for Denmark, Finland and Luxembourg are not presented below for the following reasons:

- In Denmark, it was said that RI would include the Approved Tech Service Institutions (classified with the Frascati business enterprise sector). The landscape is otherwise changing rapidly: a

number of RI were recently merged with universities. This has made the re-tabulation of the data impossible ;

- In Finland, all RI are said to belong to the government sector ;
- In Luxembourg, GOVERD and RI expenditures coincide.

12. For the other countries, re-tabulating R&D expenditure according to the new population uncovers a research institution sector, of which the size compared to the Frascati GOVERD varies from one country to another and reflects national differences in the organisation of the R&D system (see details in Annexes 1 to 4). The new figures include, on the one hand, research institutions under the umbrella of the other Frascati sectors, predominantly the business enterprise sector, and exclude, on the other hand, government institutions whose primary goal is not R&D (various governmental agencies, hospitals, museums conducting research, etc.)

13. The importance of Frascati business institutions in the new population has also an impact on the distribution of expenditures in terms of sources of funds (more business funding), types of R&D (more applied R&D and development), as well as in terms of field of science (FOS) (more engineering and technology) and socio-economic objectives (more industrial production).

### **Conclusions and next steps**

14. These results were discussed at the NESTI/RIHR expert meeting held on 6 May 2010 at the OECD headquarters. Participants agreed that the unit of analysis was difficult to define, that there would always be a grey zone and that it was not easy to apply strict classifications. Therefore, the definition used in the RIHR project was seen as satisfactory for the purpose of the project, since it is important to analyse the grey zone. In other words, the RIHR project definition is probably well suited to (statistically) describe the characteristics and transformation of research institutions at national level (as exemplified by the Russian case in Annex 4). On the other hand, it should probably not be used to make international statistical comparisons of the research institution sectors (e.g. comparing their sizes)

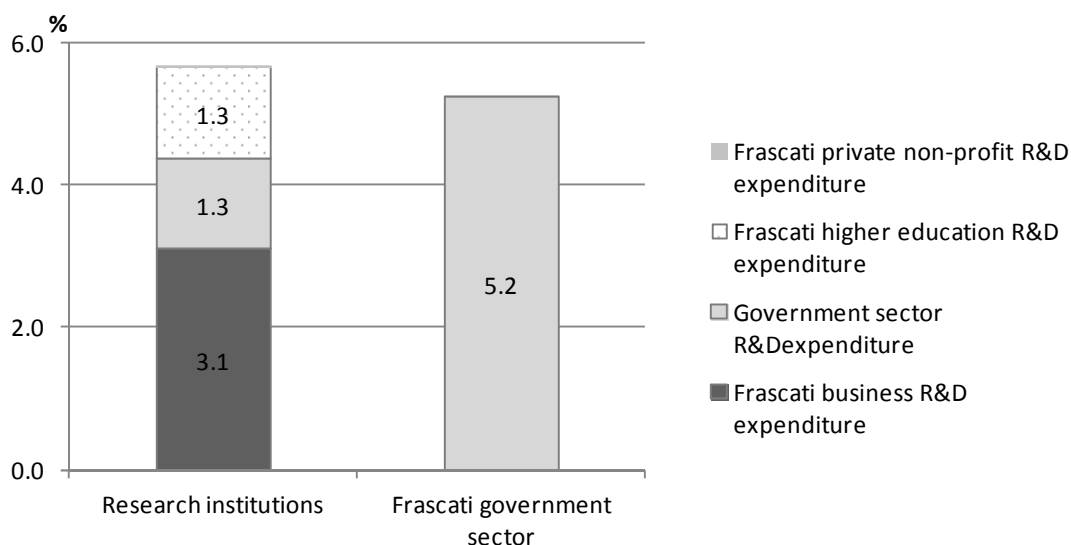
15. Participants agreed that the case study results and data re-tabulation exercise could be supplemented with a survey of institutions as originally discussed in the project proposal. The NESTI Secretariat recalled the results of a survey of research institutions conducted in Russia. Participants agreed it would be beneficial to see the Russian survey instrument and noted that it would be helpful to see the Finnish internationalisation questionnaire as well.

16. They agreed that it would be important to define the unit of analysis (e.g. institution as a whole, division) and design the survey accordingly. Participants also agreed to start working on a survey design and this will be further discussed at the meeting.

**ANNEX 1: AUSTRIA**

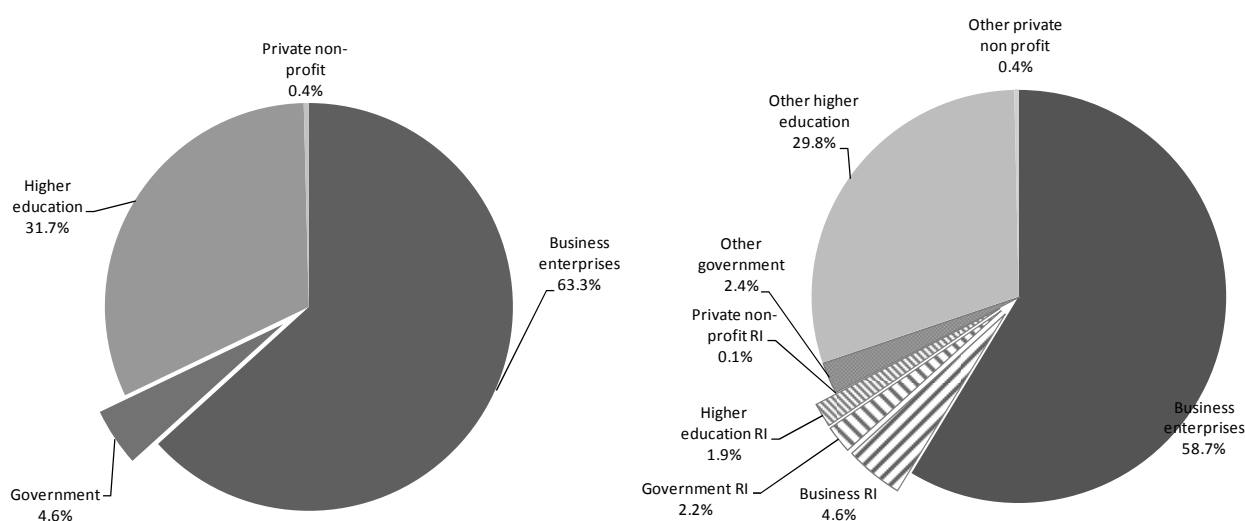
**Data tabulation results and country note by Statistics Austria**

**Figure 1. Research institutions expenditure and GOVERD as a percentage of GERD in Austria – 2006**



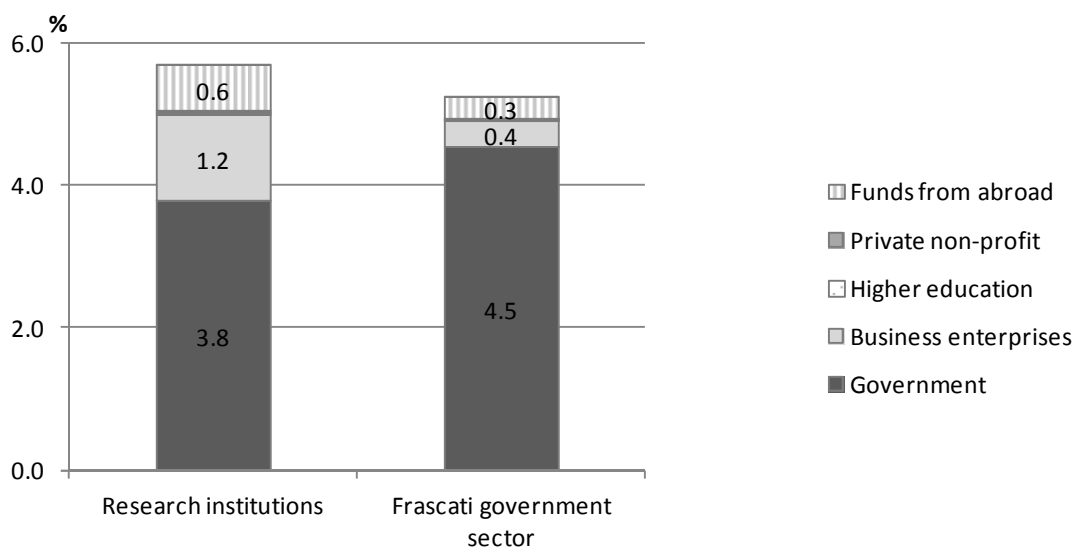
Source: Statistics Austria and OECD data.

**Figure 2. GERD breakdown by Frascati sectors of performance showing research institutions according to RIHR in Austria – 2006**



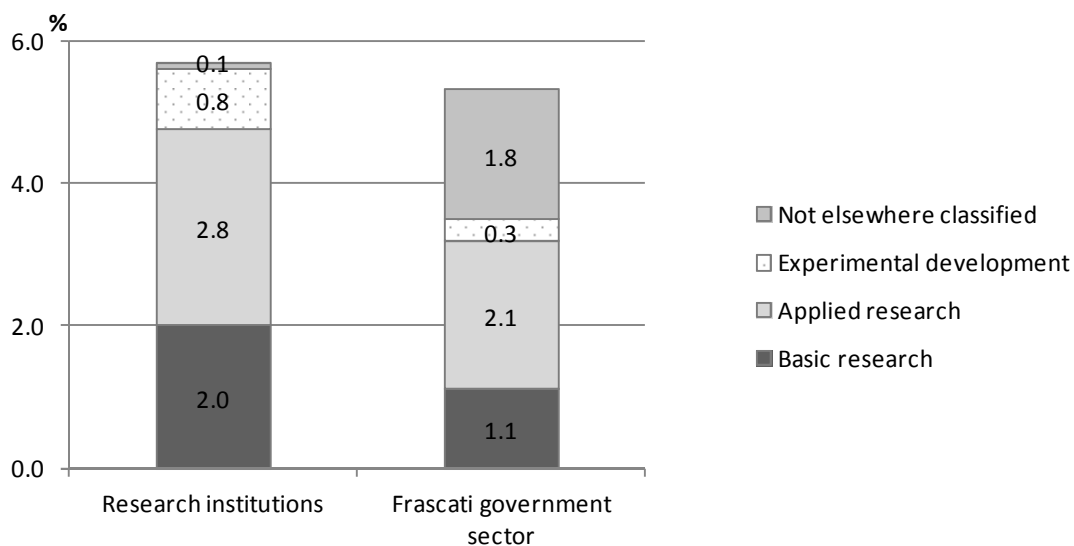
Source: Statistics Austria and OECD data.

**Figure 3. Research institutions expenditure and GOVERD by sources of funds as a percentage of GERD in Austria -- 2006**



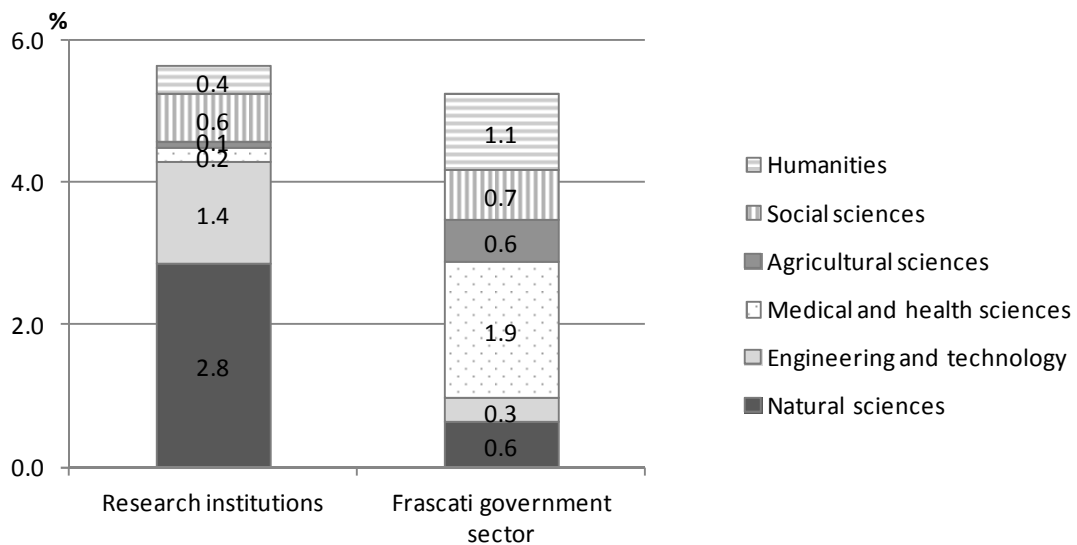
Source: Statistics Austria and OECD data.

**Figure 4. Research institutions and government current R&D expenditure by types of R&D as a percentage of total current R&D expenditure in Austria – 2006**



Source: Statistics Austria and OECD data.

**Figure 5. Research institutions expenditure and GOVERD by fields of science as a percentage of GERD in Austria – 2006**



Source: Statistics Austria and OECD data.

**Table 1. Research institutions expenditure and GOVERD by socio-economic objectives as a percentage of GERD in Austria – 2006**

	Research institutions	Frascati government sector
Exploration and Exploitation of the Earth Environment	0.3	0.4
Exploration and Exploitation of Space	0.0	0.0
Transport, telecommunication and other infrastructures	0.3	0.2
Energy	0.0	0.1
Industrial production and technology	2.9	0.0
Health	0.6	1.9
Agriculture	0.0	0.6
Education	0.0	0.1
Culture, recreation, religion and mass media	0.1	0.2
Political and social systems, structures and processes	0.5	0.5
General advancement of knowledge	0.8	1.1
Defence	0.0	0.0

Source: Statistics Austria and OECD data.

## COUNTRY NOTE BY STATISTICS AUSTRIA

Around 55 per cent of total R&D expenditure 2006 for the research institutions (RIs) in question is spent in institutions which are classified in the Business enterprise sector according to the Frascati Manual. The vast majority of these institutions are part of the so-called “Institutes sub-Sector” (“Kooperativer Bereich”), according to the national terminology. The national “Institutes sub-Sector” accounts for approximately 10 per cent of total BERD and consists of all members of the ACR (“Austrian Co-operative Research”). Those comprise institutions which are mostly service institutions which carry out R&D on behalf of enterprises. Most of them are not orientated towards commercial revenue. Furthermore, this also includes the Austrian Institute of Technology (AIT; formerly Austrian Research Centers GmbH (ARC), colloquially also known under the name of its location “Seibersdorf”) and the “Joanneum Research Forschungsgesellschaft mbH” (JR). The “Institutes Sub-Sector” additionally includes the “competence centres” (“Kplus”, and K ind”). The “K net” institutes are not covered by the national R&D survey because they are not considered to perform R&D (as they have rather a networking function and coordinate R&D activities between the various R&D performers).

Altogether, 50 R&D performing statistical units which come from the Business enterprise sector contribute to the aggregated R&D data for the RIs. However, it should be mentioned that JR and AIT are considered borderline institutions to in the Government sector according to the Frascati Manual. The Research Studios Austria (RSA) which were relevant for 2006, were not covered separately in the R&D survey, but R&D data were captured via their hosting institute.

Around 22 per cent of R&D expenditure 2006 for the RIs in question is spent in institutions which are classified in the Higher education sector. Almost all is due to the R&D activities of the Austrian Academy of Sciences (ÖAW) which are classified into this sector because of the extremely high interrelations regarding staff and its association with public universities. The “CDGs” (“Christian-Doppler-Forschungsgesellschaften”) are not separate statistical units in the national R&D survey. Data for the CDGs are included as parts of the institutes, departments etc. of the universities and cannot be separated from these units. Therefore no R&D data for the CDGs are included. The Josef Ressel institutes were not yet relevant for 2006 and will not be covered as separate statistical units, but will included in the data reports of the Universities of applied sciences (“Fachhochschulen”). The “Laura-Bassi Centres of Expertise” did not yet exist in 2006. For forthcoming R&D surveys their R&D activities will be covered within their hosting institute at the university. 62 R&D performing units from the Higher education sector contribute to the RI’s R&D activities.

Another around 22 per cent of R&D expenditure 2006 for the RIs in question is spent in institutions which are classified in the Government sector itself. This includes the units of the “Ludwig Boltzmann societies” (LBG) as well as many non-profit institutions which are mostly funded by government and according to the Frascati sector classification belong to the Government sector. R&D expenditure 2006 of the RIs (coming from the Government sector) is approximately a quarter of the R&D expenditure of the Government Sector according to Frascati. The remaining three quarter of the GOVERD not accounted falls upon the following types of institutions: A large part of R&D is done in the regional hospitals which belong to the government sector, but are not considered RIs. Another larger contribution comes from museums, libraries and the like. Schools specialised in certain fields such as forestry or agriculture (but which do not award tertiary degrees) may as well be mentioned. The Institute of Science and Technology Austria (ISTA) will be covered by the R&D survey for the first time in 2009 as it was not in operation in



2006. 114 units used for this exercise are classified in the Government sector according to the Frascati Manual.

Contributions from 9 units of the Private non-profit sector are very small and practically negligible (less than 0.5 per cent of total R&D expenditure of the RIs).

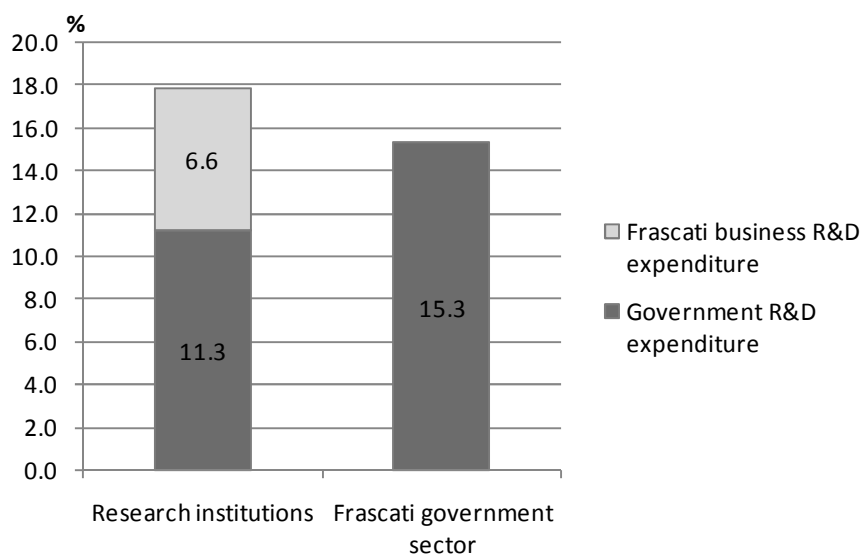
Regional hospitals are not covered via the R&D survey, but by estimation of their R&D expenditure by taking account of the reports of the regional governments. R&D personnel of the regional hospitals are not estimated. Therefore R&D personnel of the Government sector according to the Frascati Manual are underestimated. As a consequence, the increase of 2.2 per cent of total R&D personnel between the “Frascati” Government sector and the newly created “RIs” is an overestimation.

Altogether, R&D aggregates for RIs are composed of 232 statistical units. Further 40 units are included in the R&D survey 2006, but reported no R&D expenditures and R&D personnel. It should be noted that the “statistical unit” does not always coincide with exactly one “entity” in the “Austrian country context note on public research institutions”.

**ANNEX 2: NORWAY**

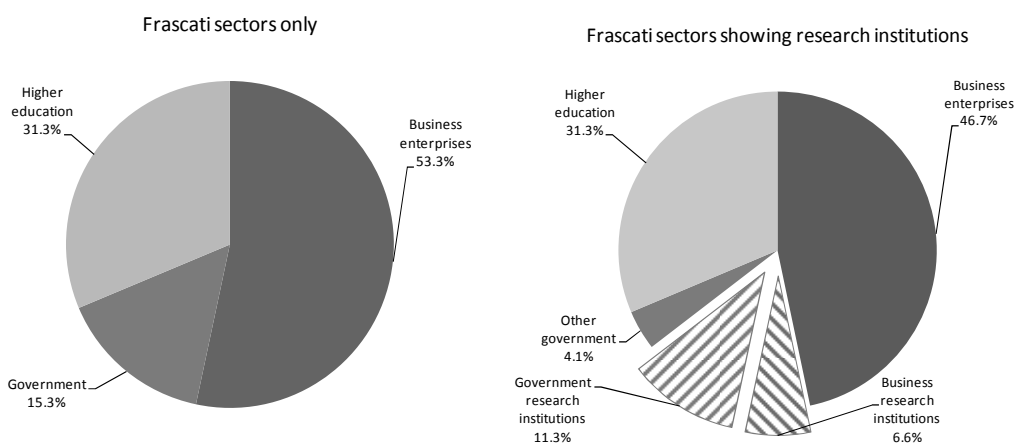
**Data tabulation results and country note by NIFU STEP**

**Figure 1. Research institutions expenditure and GOVERD as a percentage of GERD in Norway – 2007**



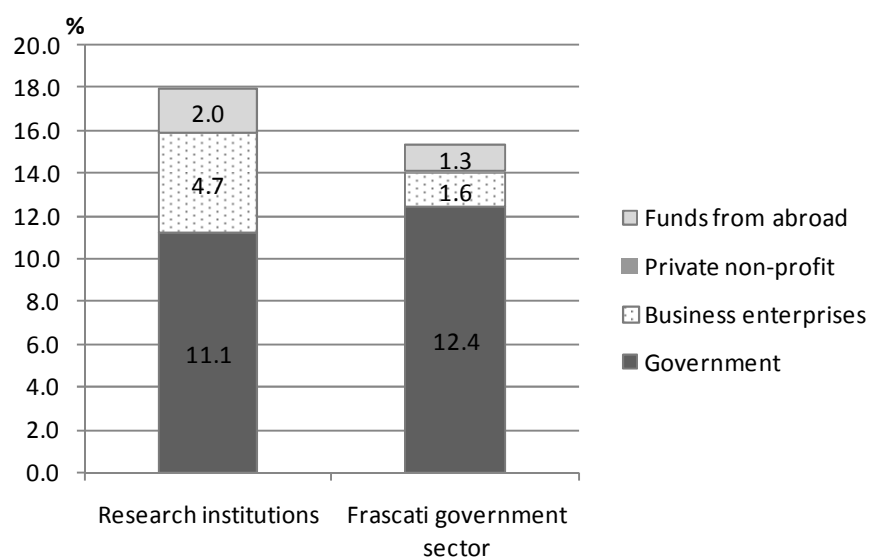
Source: NIFU STEP and OECD data

**Figure 2. GERD breakdown by Frascati sectors of performance showing research institutions according to RIHR in Norway -- 2007**



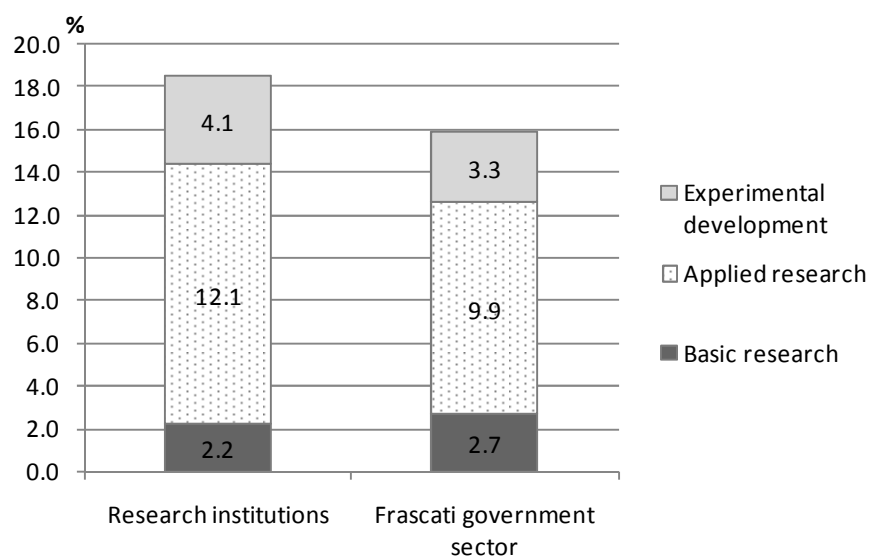
Source: NIFU STEP and OECD data

**Figure 3. Research institutions expenditure and GOVERD by sources of funds as a percentage of GERD in Norway -- 2007**



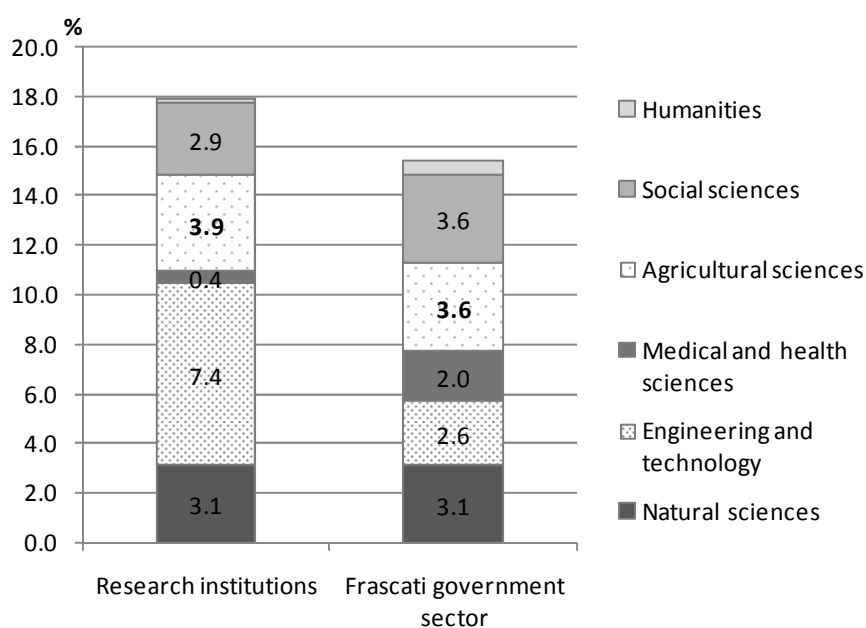
Source: NIFU STEP and OECD data

**Figure 4. Research institutions and government current R&D expenditure by types of R&D as a percentage of total current R&D expenditure in Norway -- 2007**



Source: NIFU STEP and OECD data

**Figure 5. Research institutions expenditure and GOVERD by fields of science as a percentage of GERD in Norway -- 2007**



Source: NIFU STEP and OECD data

**Table 1. Research institutions expenditure and GOVERD by socio-economic objectives as a percentage of GERD in Norway -- 2003**

	Research institutions	Frascati government sector
Exploration and Exploitation of the Earth	0.2	0.3
Environment	1.7	1.8
Exploration and Exploitation of Space	0.1	0.1
Transport, telecommunication and other infrastructures	1.1	0.3
Energy	1.2	0.7
Industrial production and technology	5.7	1.5
Health	0.6	1.4
Agriculture	3.6	3.4
Education	0.2	
Culture, recreation, religion and mass media	0.2	
Political and social systems, structures and processes	2.4	
General advancement of knowledge	0.2	0.4
Defence	1.6	1.5

Source: NIFU STEP and OECD data

**DESCRIPTION OF THE NORWEGIAN RESEARCH INSTITUTE SECTOR PROVIDED BY  
MS. SUSANNE LEHMANN SUNDNES AND MR. BO SARPEBAKKEN, NESTI DELEGATES  
FROM NIFU STEP**

The Norwegian Institute sector is split when reporting R&D statistics to the OECD. The major part is classified to the Government sector (incl. PNP), and institutes mainly serving enterprises are classified in the BES. The selection of institutions in the Norwegian pilot, the retabulated institutions, are institutions that in 2007 were subject to the Norwegian guidelines for government core funding. Some of them are in the BES, and most are in Government sector when reporting to OECD. A list based on the same criteria would however not be the same for 2009, as some other criteria will be used by the Norwegian Research Council concerning core funding *i.e. Institutions subject to result based funding.*

The entities in the Norwegian Institute Sector vary a lot both in size and R&D share. The institutions included in the pilot all have research as their primary or one of their primary goals. However many of them also have other tasks, which means that some have an R&D share as low as under 50 per cent of their turnover. There are other institutions, which are not included in the pilot, that both have a high R&D share and research as their main objective. They include among others the Simula Research Laboratory and the Nansen Environmental and Remote Sensing Center. Both are rather closely affiliated with the universities, but nevertheless own legal subjects, and they are primarily financed and controlled by public sources. You can find some more information on these institutes in the Institute catalogue on our website: Simula: [http://english.nifustep.no/norsk/institutter/simula\\_research\\_laboratory](http://english.nifustep.no/norsk/institutter/simula_research_laboratory)

NERSC: [http://english.nifustep.no/norsk/institutter/nansen\\_senter\\_for\\_miljoe\\_og\\_fjernmaaling](http://english.nifustep.no/norsk/institutter/nansen_senter_for_miljoe_og_fjernmaaling)

A number of centrally state owned institutions also have variable R&D activity, although their main purpose according to their regulations is not to conduct R&D. However some have a R&D share at the same level or above a number of the entities in the new research institution population. They include among others the Norwegian Polar Institute and several institutions under the Ministry of Health and Care Services, like the Norwegian Institute of Public Health and the Cancer Registry of Norway, Institute of Population-Based Cancer Research. (This is the main reason why the R&D effort directed towards Medical and health sciences is much lower in the new research institution population.)

Polar Institute: [http://english.nifustep.no/norsk/institutter/norsk\\_polarinstitutt](http://english.nifustep.no/norsk/institutter/norsk_polarinstitutt)

Institute of Public Health: [http://english.nifustep.no/norsk/institutter/nasjonalt\\_folkehelseinstitutt](http://english.nifustep.no/norsk/institutter/nasjonalt_folkehelseinstitutt)

Cancer Registry of Norway:

[http://english.nifustep.no/norsk/institutter/kreftregisteret\\_institutt\\_for\\_populasjonsbasert\\_kreftforskning](http://english.nifustep.no/norsk/institutter/kreftregisteret_institutt_for_populasjonsbasert_kreftforskning)

Other centrally state institutions have a lower R&D share, but they still deliver a significant contribution within their respective research fields. They include:

Statistics Norway, Research Department:

[http://english.nifustep.no/norsk/institutter/statistisk\\_sentralbyraas\\_forskningsvirksomhet](http://english.nifustep.no/norsk/institutter/statistisk_sentralbyraas_forskningsvirksomhet)

Norwegian Radiation Protection Authority:

[http://english.nifustep.no/norsk/institutter/statens\\_straalevern](http://english.nifustep.no/norsk/institutter/statens_straalevern)

The Geological Survey of Norway:

[http://english.nifustep.no/norsk/institutter/norges\\_geologiske\\_undersokelse](http://english.nifustep.no/norsk/institutter/norges_geologiske_undersokelse)

The examples mentioned above are classified in the Government Sector, but they are not in the new research institution population. In addition the Government sector also includes research at hospitals outside of the universities and research at museums. The R&D share in these institutions is low, but the number of institutions is high, so the aggregated R&D activity will therefore account for quite a substantial share. The museums for example account for about 100 million NOK, which is more than half of the R&D directed towards the humanities in the sector. But of course, research is not the primary goal for these institutions.

The institute sector also includes two BES institutes that were not included in the new research institution population. They are more industry oriented and arguably not public or semipublic:

The Norwegian Institute of Wood Technology:

[http://english.nifustep.no/norsk/institutter/norsk\\_tretekknisk\\_institutt](http://english.nifustep.no/norsk/institutter/norsk_tretekknisk_institutt)

The Paper and Fibre Research Institute:

[http://english.nifustep.no/norsk/institutter/papir\\_og\\_fiberinstituttet\\_as](http://english.nifustep.no/norsk/institutter/papir_og_fiberinstituttet_as)

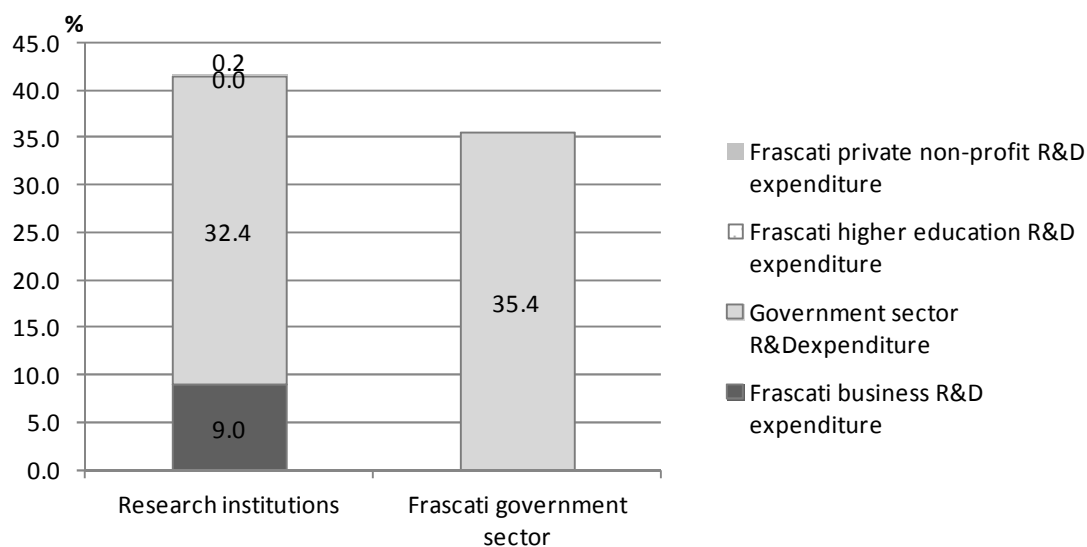
The Norwegian R&D survey of the Institute Sector covers all the known institutions performing R&D that are not included in HES and where profits are reinvested in activities in the institution. On this background we consider that the whole institute sector, maybe with the exception of the two institutes mentioned in the last article, could be regarded as public or semipublic institutions, and as such included in the RIHR project. This would more or less be in line with the RIHR definition except for the formulation whose primary goals are to conduct research. As seen above this is not the main objective of all the institutions, although many still perform R&D to a large extent. Some of them have a large share of R&D of their total activity, others only perform R&D to a small extent. However, the institutions in the pilot are also a mixture of research institutes with various R&D activity.

In the national R&D statistics we publish figures for the whole sector, so in this aspect there would not be need for much retabulation if we included all or almost all institutes.

### ANNEX 3: POLAND

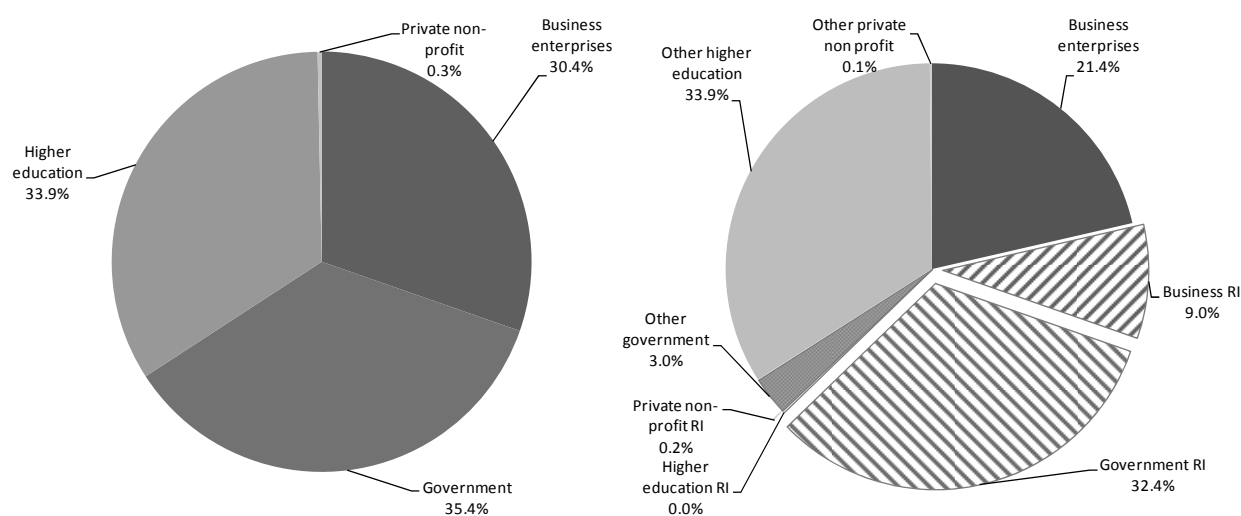
#### Data tabulation results and country note

Figure 1. Research institutions expenditure and GOVERD as a percentage of GERD in Poland – 2007



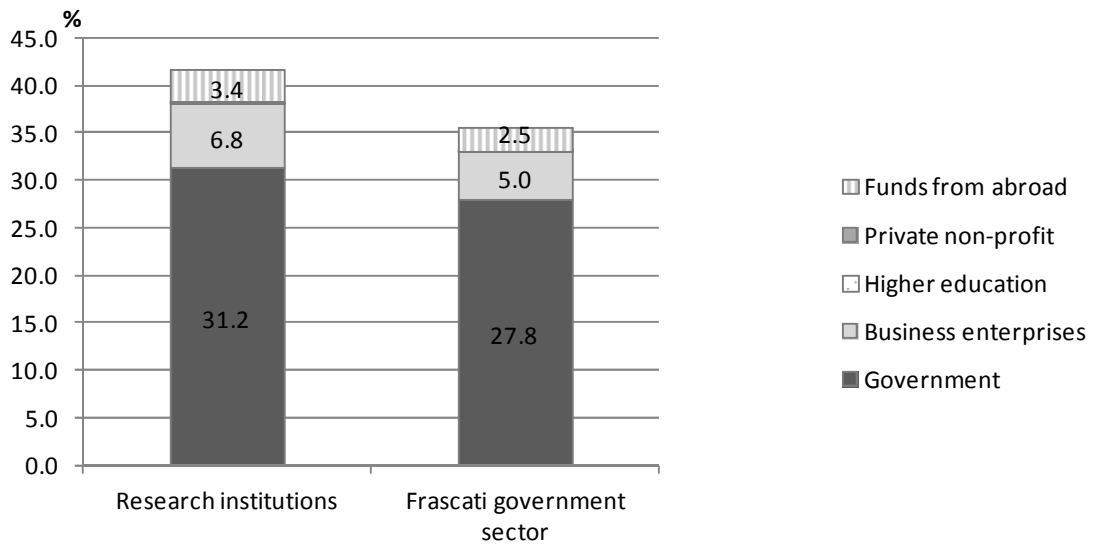
Source: Central Statistical Office of Poland and OECD data

Figure 2. GERD breakdown by Frascati sectors of performance showing research institutions according to RIHR in Poland -- 2007



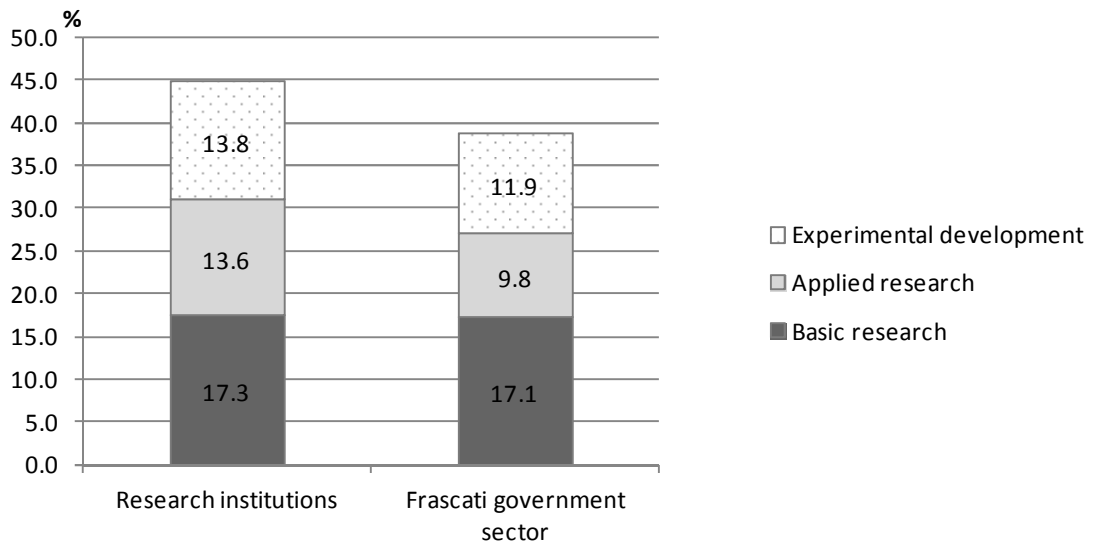
Source: Central Statistical Office of Poland and OECD data

**Figure 3. Research institutions expenditure and GOVERD by sources of funds as a percentage of GERD in Poland -- 2007**



Source: Central Statistical Office of Poland and OECD data

**Figure 4. Research institutions and government current R&D expenditure by types of R&D as a percentage of total current R&D expenditure in Poland – 2007**



Source: Central Statistical Office of Poland and OECD data



**SHORT DESCRIPTION OF THE POLISH RESEARCH INSTITUTIONS**  
**(a detailed list of institutions is available upon request)**

The definition of the research institutions (RIs) we agreed on was:

“National entities, irrespective of their legal status (organised under public or private law):

- whose primary goals are to conduct fundamental research, industrial research, experimental development, training, consulting and service provision, and to disseminate their results by way of training, publication and technology transfer; and
- whose profits (if any) are reinvested in these activities, the dissemination of their results, or training; and
- which are either totally or to a substantial share publicly owned, and/or are funded primarily from public sources via base funding (block grants) or through contract-based research, and/or are regulated, so as to achieve primarily public missions.”

The Polish public research institute sector in Fall 2009 consisted of several sub-groups. The main parts were:

- institutes of Polish Academy of Sciences (77) and
- branch R&D institutes subordinated to different ministries (136).

The sector and its size are a legacy of the communist regime, even if some institutes have been founded before 1939.

After 1989 the number of institutes was reduced and the system became more diversified: some new sub-groups appeared.

A full description of the system is available in the note *Public research institutes in Poland – OECD RIHR study*.

In the study on RI statistics following groups were taken into account:

1. Polish Academy of Science Institutes, see the list of 79 institutions [http://www.instytucja.pan.pl/index.php?option=com\\_content&view=article&id=787&Itemid=42](http://www.instytucja.pan.pl/index.php?option=com_content&view=article&id=787&Itemid=42); two institutions have been omitted in the project list (the botanic garden and the museum). Institutes are acting on the basis of the Act of Law on Polish Academy of Sciences and Act of Law on Science Funding; both acts are defining their mission. The Act of Law on Science Funding additionally prescribed conditions under which research institutions can apply for the title of “research unit” (jednostka naukowa”) in connection with categories enabling for the receipt of statutory funding. All PAS institutes fulfill without any reservation the prescribed criteria. They all are receiving from the state budget (via the Ministry of Science and

- Technology) core statutory funding and are subordinated both to the Ministry and to the umbrella organization – the Polish Academy of Sciences.
2. Branch R&D institutes (136) subordinated to different ministries are acting on the basis Act of Law on the Branch R&D Units and Act of Law on Science Funding; both acts are defining their mission. They were created and they are owned by the state and they may apply for core statutory funding (received from the state budget via the Ministry of Science and Technology). Among them there are 62 industrial institutes subordinated to the Ministry of Economy; usually most of their R&D budget is coming from the market (selling products and services, renting property etc.). Therefore some institutes might not fulfill the criterion “funded primarily from public sources via base funding (block grants) or through contract-based”. There is no updated and publicly available list, so see the project *List of public research institutes* (“Research institutes”).
  3. Commercial branch R&D institutes (four the list), still state-owned, but designated for privatization. They might not fulfill criterion “funded primarily from public sources via base funding (block grants) or through contract-based”.
  4. Private R&D institutes (previously state-owned, now joint stock, limited liability or cooperative companies), they do not fulfill the criterion “either totally or to a substantial share publicly owned”, but might still apply and receive core statutory funding. They are registered as SOO (limited liability, 19), “SA” (joint stock, 4), or “cooperative” (1) in the project list. They are acting on the basis of the Commercial Code.
  5. The category other governmental institutes (10), subordinated to different ministries consists of two sub-groups: those institutes that lost the status of branch R&D institute (quite recently two Ministry of Culture and two Ministry of Justice institutes) and those that never had it. All institutes carry out some research, but essentially they have other missions than research (e.g. cultural). However, ministerial decisions to change their status and withdraw them from the jurisdiction of the Act of Law on the Branch R&D Units were mostly determined by managerial criteria, and not under the consideration of their share of R&D. The size of R&D differs from one institute to another. Before the planned survey we know quite little about their activity. It is possible that after the survey we might realize that some of them were included in our category by mistake. The legal bases for the “other governmental institutes” are internal ministerial regulations and the act of law on the public finance.
  6. Institutes having status of foundations (18) and learned society (1) usually receive the lion’s share of their budget from external sources, be they governmental (including the National Bank of Poland), European, private or non-profit. Usually the structure of the income differs from one year to another and usually they apply for different grants. Only one institute publishes the sources of its income on its Web home page. Usually they conduct some research, but more often consultancy, advising, expertises and analysis (at the border of research). In the same way, it is possible that after the survey we might realize that some of them were included in our category by mistake.

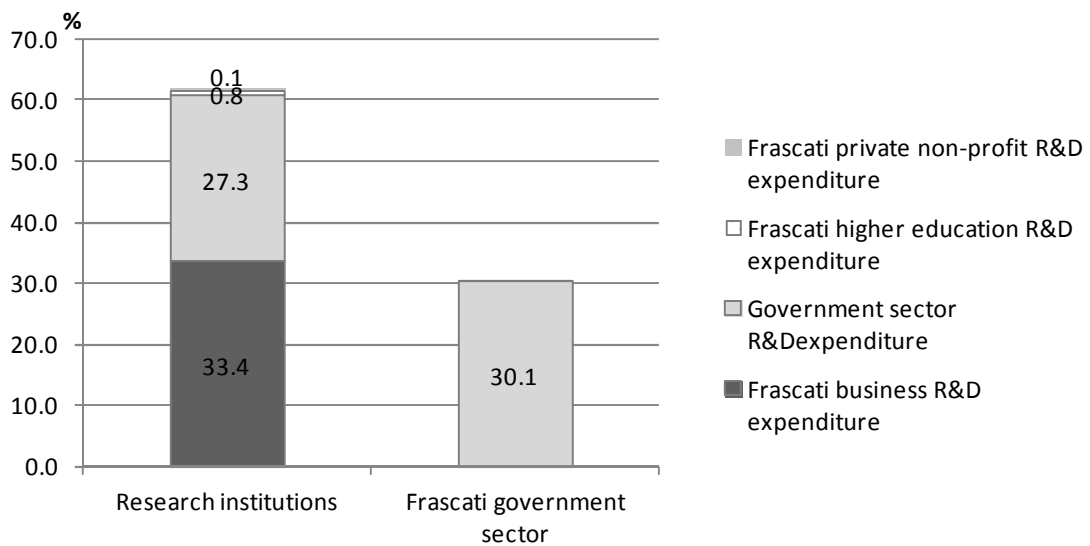
There are boundary cases: university foundations that rarely make some research and (at least) two independent institutes in the frame of the private schools (without separate legal status). They are not included here.

A new phenomenon developing is the birth of boundary organizations, which are those museums (so far two) that received the status of the “scientific unit”. Some other museums, as well as libraries and archives, consider applying for the same status.

**ANNEX 4: RUSSIAN FEDERATION**

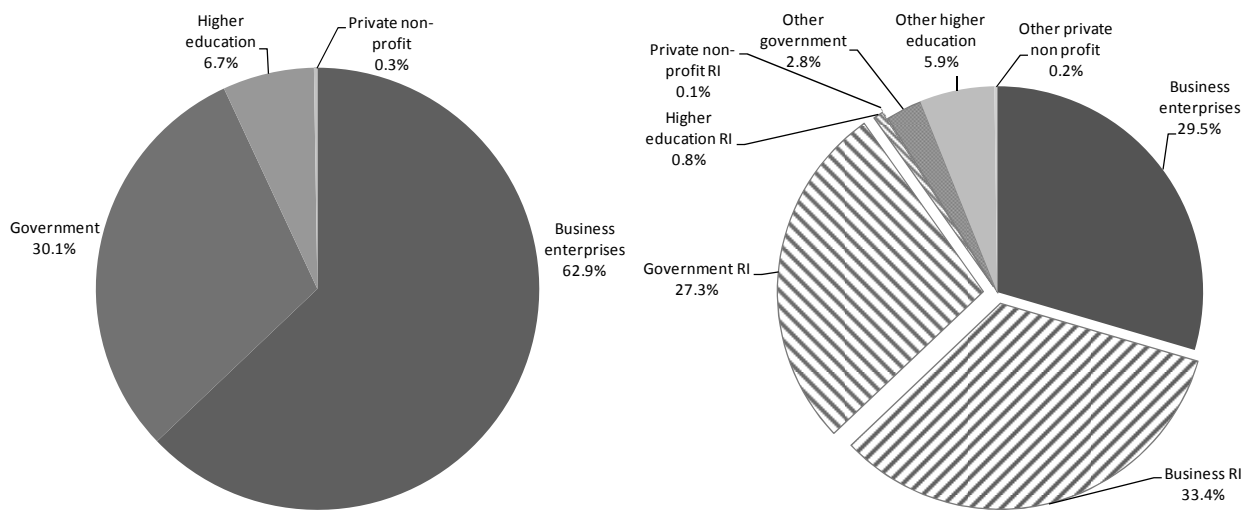
**Data tabulation results and country note**

**Figure 1. Research institutions expenditure and GOVERD as a percentage of GERD in the Russian Federation – 2008**



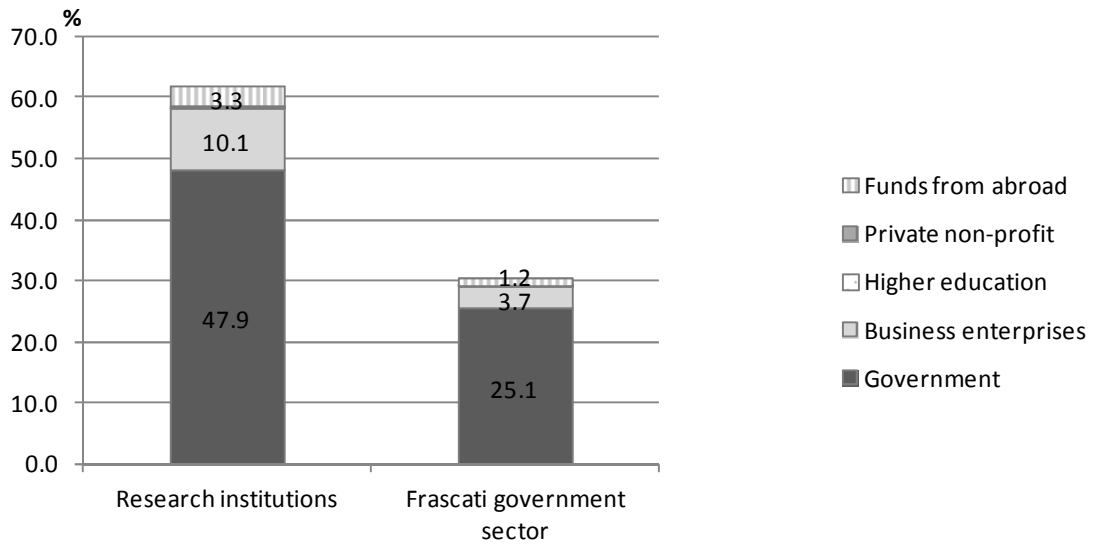
Source: Higher School of Economics, Russia, and OECD data.

**Figure 2. GERD breakdown by Frascati sectors of performance showing research institutions according to RIHR in the Russian Federation – 2008**



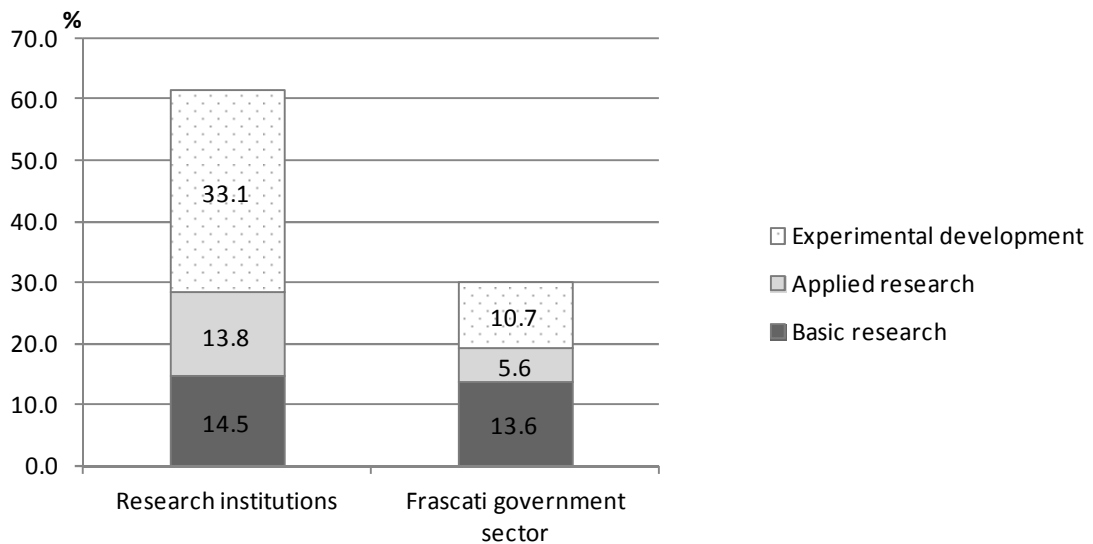
Source: Higher School of Economics, Russia, and OECD data.

**Figure 3. Research institutions expenditure and GOVERD by sources of funds as a percentage of GERD in the Russian Federation -- 2008**



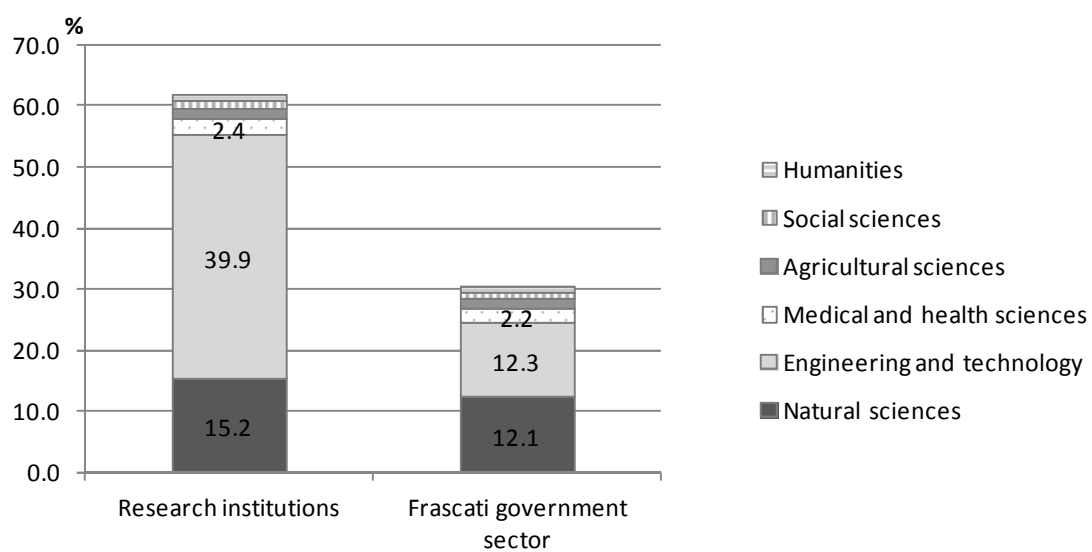
Source: Higher School of Economics, Russia, and OECD data.

**Figure 4. Research institutions and government current R&D expenditure by types of R&D as a percentage of total current R&D expenditure in the Russian Federation – 2008**



Source: Higher School of Economics, Russia, and OECD data.

**Figure 5. Research institutions expenditure and GOVERD by fields of science as a percentage of GERD in the Russian Federation – 2008**



Source: Higher School of Economics, Russia, and OECD data.

**COUNTRY NOTE PREPARED BY LEONID GOKHBERG AND STANISLAV ZAICHENKO  
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The collapse of the Soviet Union, and the transition to a market economy, radically affected the national R&D system inherited from the ex-USSR. However its composition still bears fundamental features traditionally notable for the Soviet R&D model.

As described in (*Gokhberg et al., 1997*), an initial (Soviet) national sectoral classification for R&D was based on a combination of such criteria as administrative subordination, type of institution and function of R&D units. It contained four key sectors: academic institutions, higher education sector, industrial R&D institutions, and enterprise sector.

The Academy sector included the Academy of Sciences and branch academies of agricultural sciences, medical sciences, and education. It mostly targeted basic research. Though this division of labour was not complete, since some elite universities and branch R&D institutes (particularly those in the defence sector) also carried out basic research. At the same time the academy sector contributed nearly 20% of expenditure on applied R&D in 1990.

The Higher education sector was represented by universities and allied research institutes that were separated from the Academy of Sciences (this trend has not been improved still). This separation damaged the quality of university R&D.

Industrial R&D sector was engaged primarily in applied research and development. During the Soviet period, each branch ministry established its own network of R&D units, most of which served the respective branch as a whole and sometimes particular enterprises concerned.

Enterprise sector R&D units were financed by industrial enterprises. Activities were largely directed at the immediate needs of the enterprise, such as adapting external R&D to specific production conditions and modernizing current products. The enterprise sector was the least developed of the four major R&D sectors and, in terms of expenditures, by 1990 accounted for about 8% of total Soviet R&D efforts.

The changes occurring over recent two decades have resulted in the emergence of new forms of ownership, elimination of almost all branch ministries and the building of new organisational structures, but they have not radically amended the institutional composition of the national science system (*Gokhberg and Gorodnikova, 1993*).

The contemporary statistical standards in Russia provide a sectoral classification harmonized with the Frascati Manual. It includes government, business enterprise, higher education, and private non-profit sectors. Their proportions remain almost intact during the last decade, with the dominating business enterprise sector (around 45 % of the total number of R&D-performing units).

In some cases the Frascati-based sectoral division is not informative enough to describe the institutional particularities of R&D in Russia. For example, in 2007 the government sector accounted for 37.5% of R&D units, but the publicly owned units in all sectors composed 71.3%. The privately owned R&D institutions accounted just for 16.1% (*HSE, 2009*). This situation could be explained by the fact that existing branch R&D institutes serving market are attributed to the business enterprise sector for the

statistical purposes, even though they remain under publicly owned. In the government sector 60% organizations belong to the Academy of Sciences

Another evidence could be derived from classifying R&D units by type of organization. In 2007, the business enterprise sector was represented mostly by legally independent research institutes (44%) and design organizations (22.5%) whereas industrial enterprises composed only 15.2% of the overall number of R&D units in the business enterprise sector.

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