



Role of Basic Research
in the Process of Structuring the European Research Area
Czech Republic, Prague, April 16 – 18, 2009



**RUSSIAN ACADEMY OF SCIENCES:
COMPETITIVENES AND COOPERATION WITH THE EUROPEAN UNION**

M.V. Ugrumov

Presidium of the Russian Academy of Sciences



Salvador DALÍ

Galatea of the Spheres, 1952



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**RUSSIAN ACADEMY OF SCIENCES:
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➤ Current state of the Russian Academy of Sciences (RAS)

Competitiveness of the RAS as compared with similar scientific organizations in Russia and European countries

International cooperation of the RAS, with the European countries in particular

Contribution of the RAS to the framework programs of the EU

Prospects of cooperation of the RAS with the EU countries under the principals of the open market

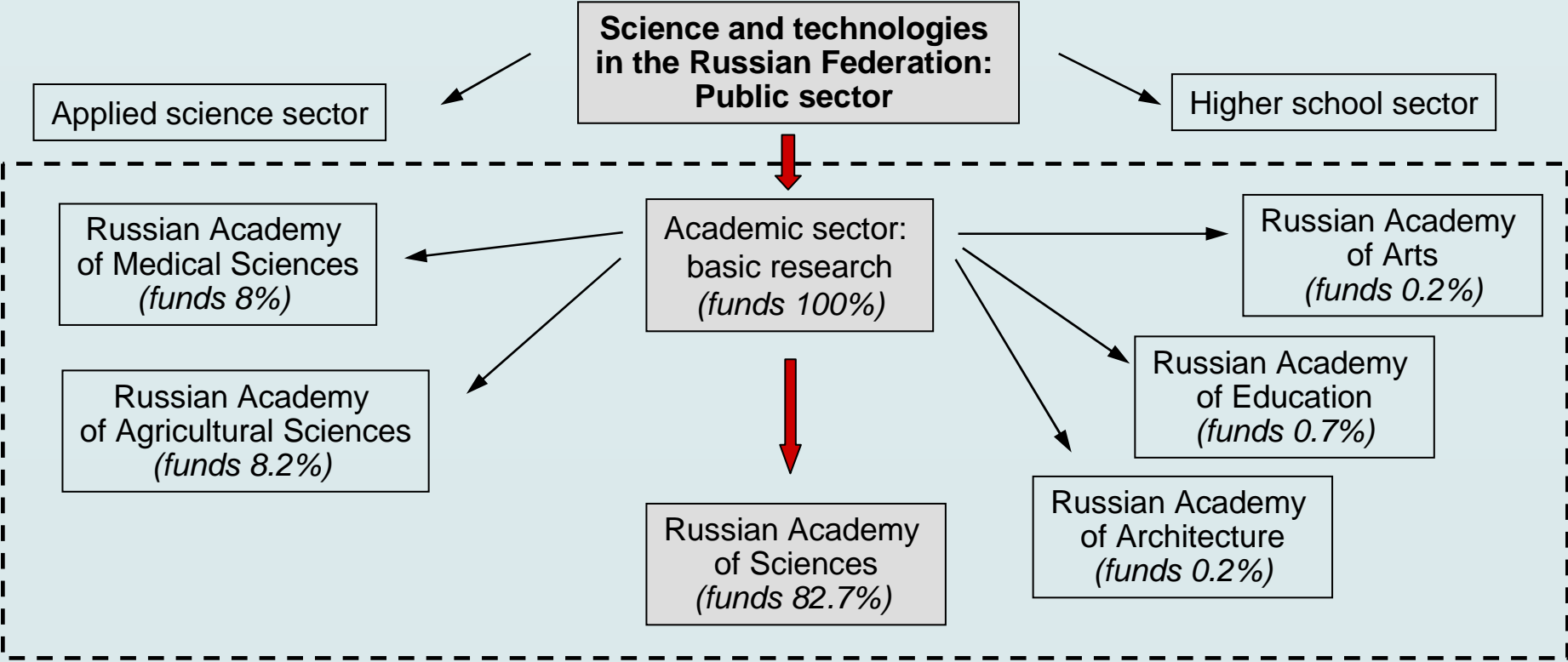
What is the Russian Academy of Sciences (RAS)

?

RAS is a state self-governed non-commercial organization with the following objectives:

- Obtaining of new knowledge in Basic and Social Sciences
 - Coordination and expertise of the investigations in Basic and Social Sciences in Russia
-
- Development of new technologies and their transferring to industry
 - Training of highly qualified researchers
 - Development of the international cooperation in Basic and Social Sciences
- } *Primary*
- } *Secondary*

RAS IS A CRUCIAL SOURCE OF NEW KNOWLEDGE IN BASIC SCIENCES IN RUSSIA



RAS : REGIONAL DEPARTMENTS

Central Department: Scientific Divisions

9 Mathematical sciences	27 Physical sciences	16 Nanoscience and information technologies
18 Power and mechanical engineering	24 Chemistry and material sciences	39 Biological sciences
21 Earth sciences	25 Social sciences	15 History and philology

Other Departments

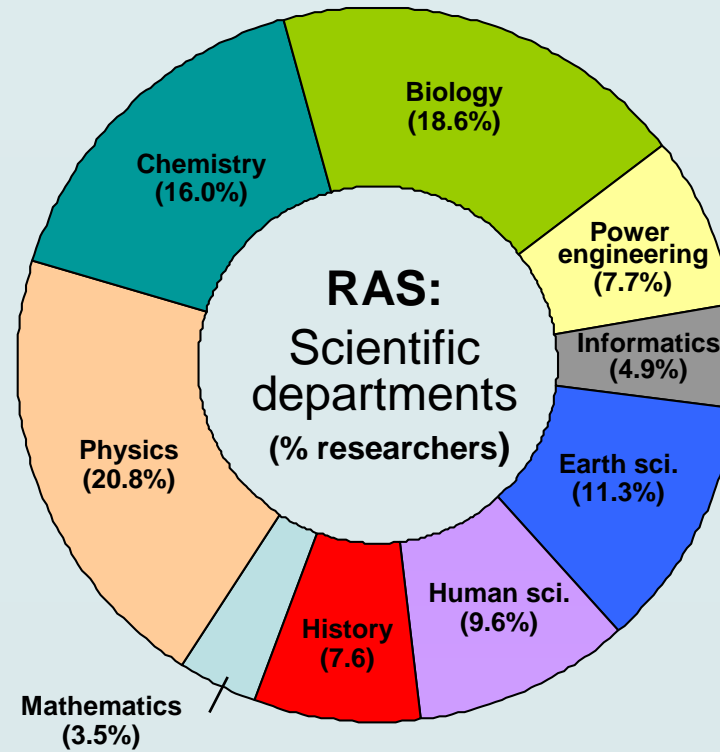
78 Siberian	40 Ural	34 Far East
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N Number of institutes

RESEARCH STAFF OF THE RAS SCIENTIFIC DEPARTMENTS

432 RAS institutes

49 683 Total number
of researchers





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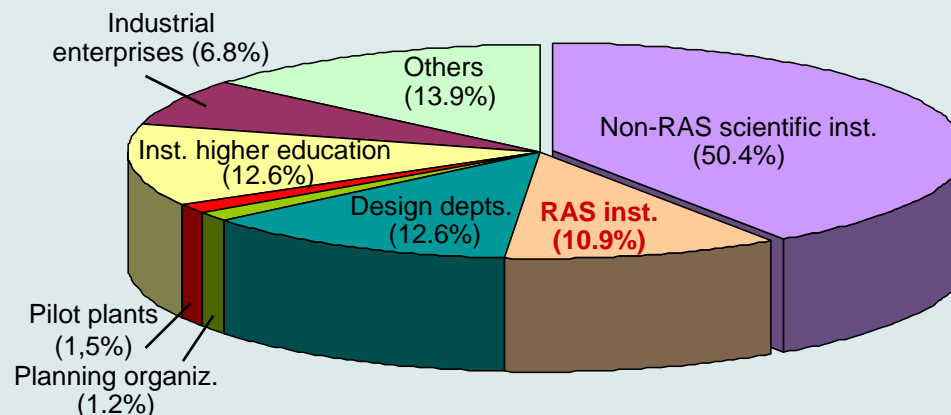
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HUMAN AND FINANCIAL RESOURCES IN BASIC AND SOCIAL SCIENCES IN RUSSIA (2007)

Comparative characteristics of non-RAS and RAS organizations in science

Organization Characteristic	Non- RAS	RAS	% RAS
Number of institutes	3 525	432	<u>10.9%</u>
Number of researchers	342 873	49 683	<u>12.7%</u>
Budgetary (non-defense) financing (M€)	2 118.0	947.9	30.9%
Off-budgetary financing (M€)	1 348.4	596.9	30.7%
Total financing (M€)	3 466,4	1 544.8	<u>30.8%</u>
Financing per researcher (T€)	10.1	31.1	<u>75.5%</u>

98.6 M€ Financing under competition of the targeted programs of the Presidium and scientific departments of the RAS



CONCLUSIONS

- ❖ Total human, infrastructure (institutes) and financial resources of the RAS are in many times lower than those of similar non-RAS organizations
- ❖ Funding of individual researchers in RAS by 3 fold exceeds that in the non-RAS organizations
- ❖ RAS targeted programs according to competition is the crucial mechanism for approaching the open market

What are the indicators of the efficiency in Basic Sciences



Papers published in peer-reviewed international journals are the principal **product** in Basic Sciences as a source of new knowledge

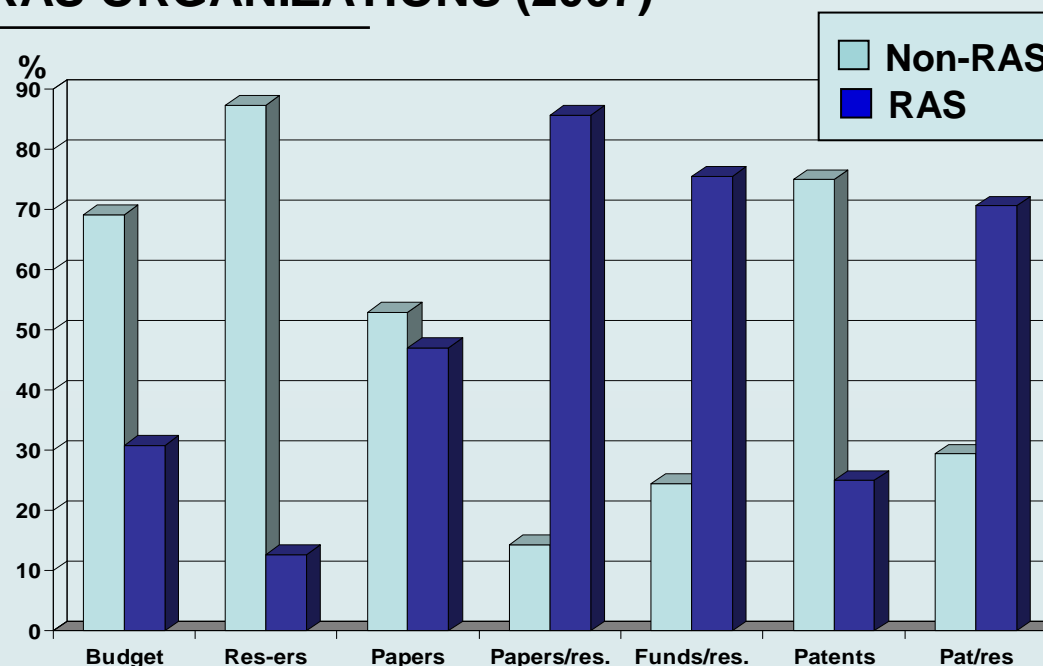
- Number of papers is a quantitative indicator of scientific efficiency;
- Impact factor of a journal is an indicator of quality of the paper;
- Citation index of a paper is an indicator of its demand in the open market

Patents serve as an indicator of the development of new technologies under new knowledge being a **co-product** in Basic Sciences

EFFICIENCY OF BASIC RESEARCH IN RUSSIA: RAS AND NON-RAS ORGANIZATIONS (2007)

Comparative competitiveness of RAS and non-RAS organizations

Organization Characteristic	Non- RAS	RAS	% RAS
Number of papers	18 776	16 641	47.0%
Number of papers per researcher	0.05	0.3	<u>85.7%</u>
Cost of one paper (T€)	184.6	92.8	<u>33.5%</u>
Number of patents	1726	572	25.0%
Number of patents per researcher	0.005	0.012	<u>70.6%</u>



Conclusions

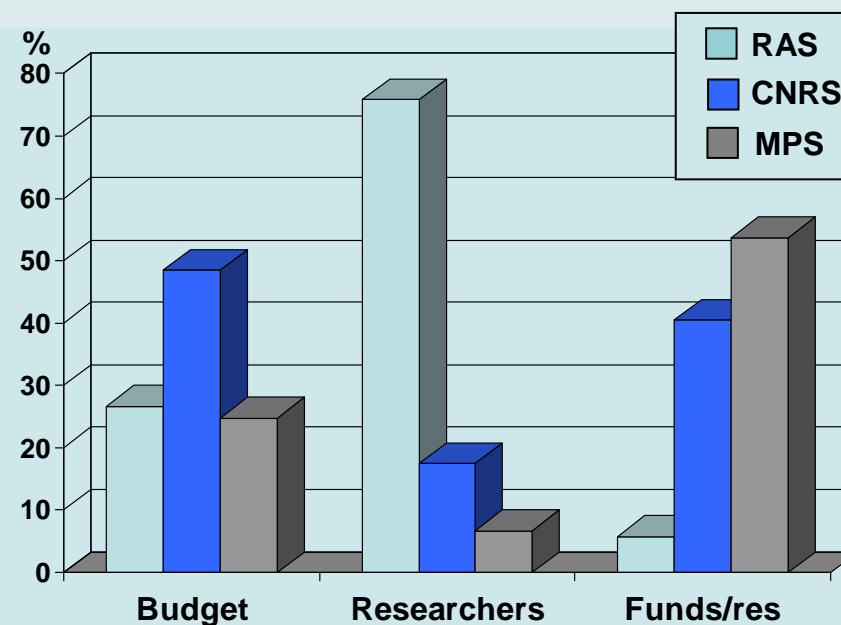
- The efficiency of RAS is as high as that of non-RAS organizations in a whole despite significantly lower human and financial recourses that is partly explained by:
 - ✓ Long-term traditions in basic sciences (“scientific schools”);
 - ✓ Well-developed infrastructure;
 - ✓ Long-term and wide international cooperation;

- The efficiency of individual researchers in RAS greatly exceeds that in non-RAS organizations.

RUSSIAN ACADEMY OF SCIENCES (RAS), CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS), MAX PLANCK SOCIETY (MPS) : HUMAN AND FINANCIAL RESOURCES (2007)

Indicators of human and financial resources

Organization Characteristic	RAS	CNRS	MPS
Number of institutes	432	1256 (Labs.)	76
Number of researchers	49 683 / 75.8%	11 500 / 17.5%	4 417 / 6.7%
Budgetary (non-defense) financing (M€)	947.9 / 21.4%	2 300 / 52.0%	1 175.6 / 26.6%
Off-budgetary financing (M€)	596.9 / 43.7%	510.0 / 37.4%	258.1 / 18.9%
Total financing (B€)	1. 5448 / 26.7%	2.810 / 48.5%	1.4336 / 24.8%
Financing per researcher (T€)	31.1 / 5.8%	244.35 / 40.5%	324.6 / 53.7%



Conclusions

- The number of researchers in RAS greatly exceeds that in CNRS and particularly in MPS
- Financial support of RAS twice as small as that of CNRS and slightly higher than in MPS
- Funding of individual researchers in RAS is by seven and nine times smaller than in CNRS and MPS, respectively

EFFICIENCY OF BASIC RESEARCH IN RAS, CNRS, AND MPS (2007)*

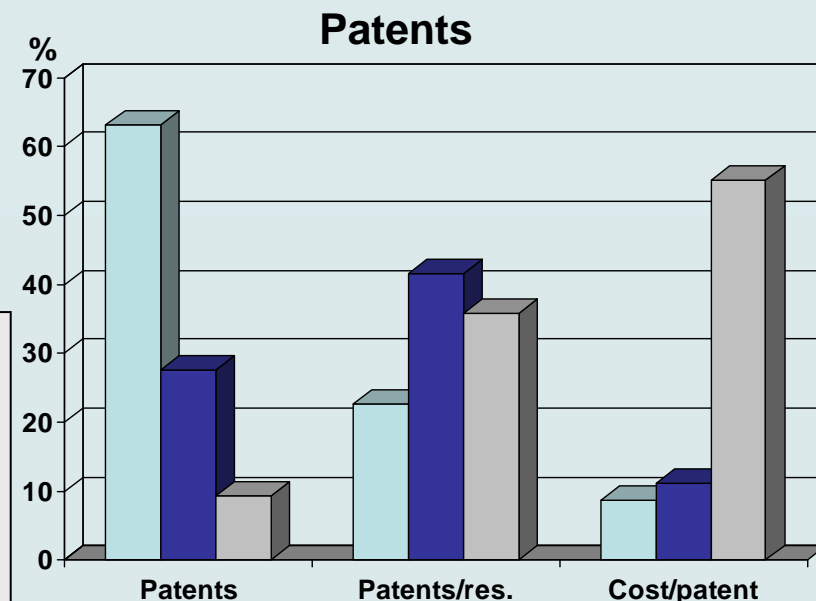
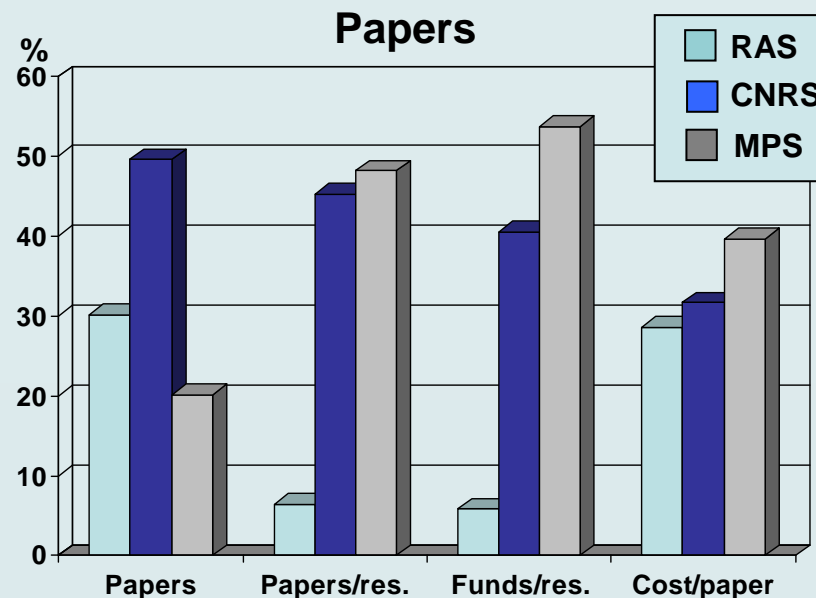
Indicators of scientific efficiency

Organization	RAS	CNRS	MPS
Characteristic			
Number of papers*	16 641 / <u>30.2%</u>	27 300 / 49.6%	11 138 / 20.2%
Number of papers per researcher	0.34 / 6.5%	2.37 / 45.3%	2.52 / 48.2%
Cost of one paper (T€)	92.8 / <u>28.6%</u>	102.93 / 31.7%	128.7 / 39.7%
Number of patents	572 / 63.1%	250 / 27.6%	84 / 9.3%
Number of patents per researcher	0.012 / 22.6%	0.022 / 41.5%	0.019 / 35.9%
Cost of one patent (M€)	2.7 / 8.7%	11.24 / 36.2%	17.1 / 55.1%

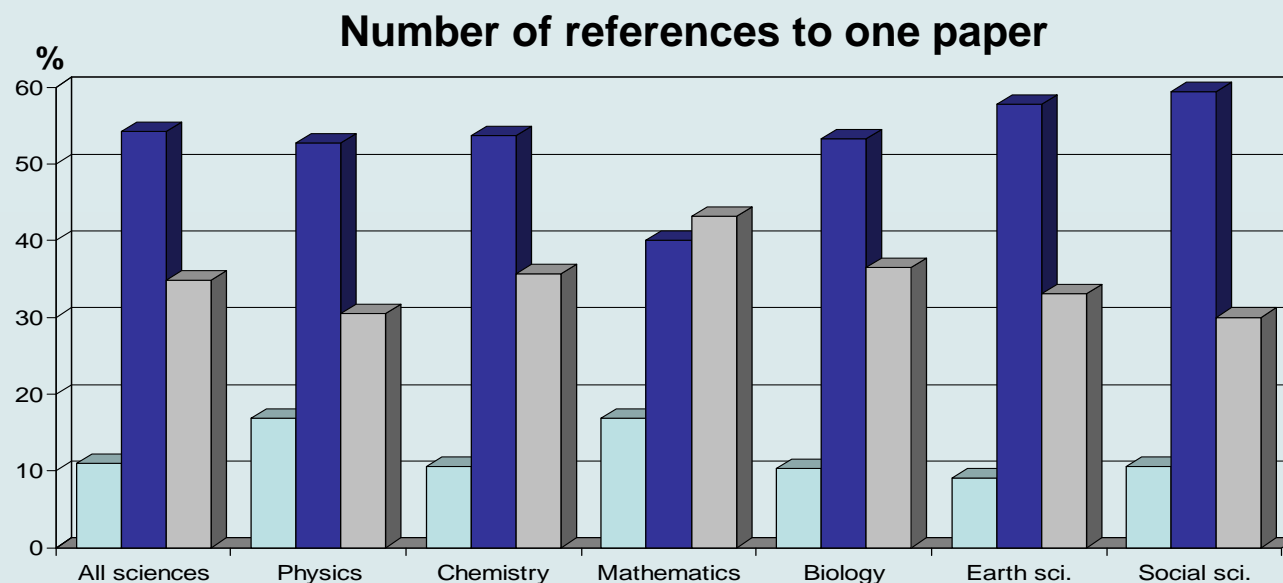
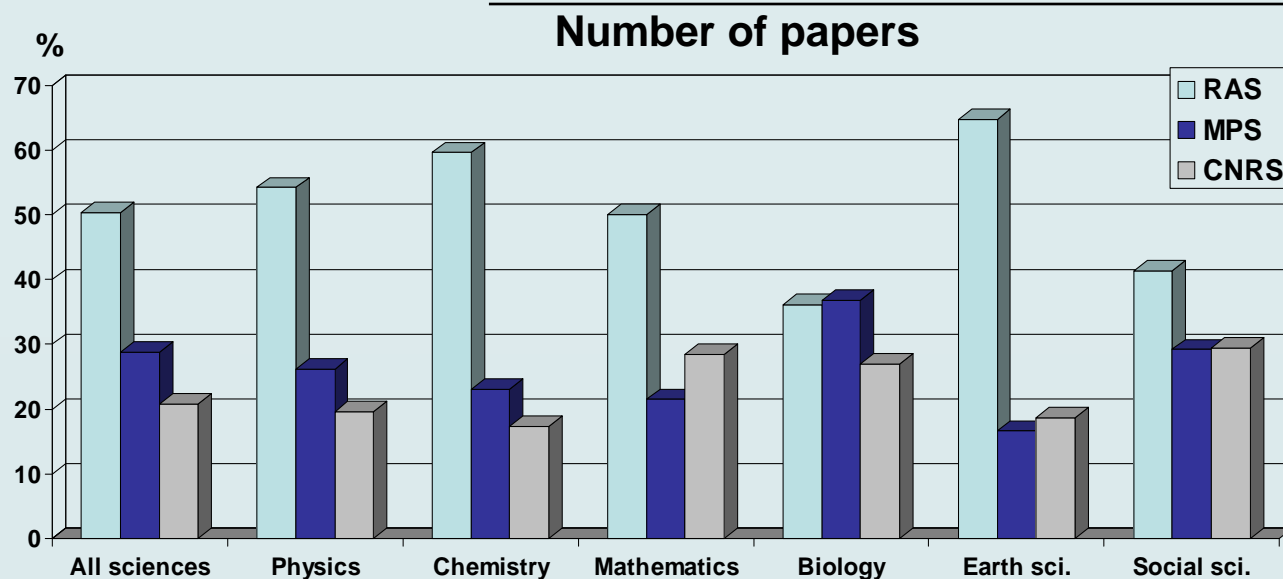
*Papers in peer-reviewed international journals

Conclusions

- The total number of papers in RAS is smaller than in CNRS but higher than in MPS
- The number of papers per researcher in RAS is significantly smaller than that in CNRS and MPS being proportional to funding of individuals
- The cost of one paper in RAS is almost the same as in CNRS, and MPS



EFFICIENCY OF BASIC RESEARCH IN RAS, CNRS, AND MPS (papers 1996-2007)*



Conclusions

- ❖ The number of papers in RAS significantly exceeds that in CNRS and MPS when evaluating papers published in selected peer-reviewed international and Russian journals*.
- ❖ Citation index of individual papers is significantly smaller in RAS than in CNRS and MPS; It might probably be higher if excluding Russian journals from evaluation.

*Papers in peer-reviewed Russian (140) and international (8000) journals (Essential Science Indicators)



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INTERNATIONAL COOPERATION OF THE RAS

- 6** Intergovernmental agreements with the RAS participation
- 9** Intergovernmental scientific programs with the RAS participation
- 108** Agreements with Academies of Sciences in **60** countries
- 46** International non-governmental scientific organizations with the RAS membership
- 415** Contracts with national scientific agencies and individual organizations in **75** countries
- 40** International joint laboratories and networks with the RAS participation
- 1782** Travel grants provided by the RAS and foreign partners in 2007 for visiting researchers

COOPERATION OF THE RAS WITH THE EUROPEAN COUNTRIES IN BASIC RESEARCH : PRINCIPAL PARTNERS

Country	Agreements
France	Centre National de la Recherche Scientifique; Institut National de la Recherche Agronomique; French Academy of Sciences; L'École des hautes études en sciences sociales; Maison des science de l'homme; Universities Bordeaux I and Paris 6
Germany	Max Planck Society, Deutsche Forschung Gemeinschaft, Berlin-Brandenburg Academy of Sciences; Helmholtz Society, German Academic Exchange Service
Italy	National Research Council, Accademia Nazionale dei Lincei, "Alessandro Volta" Centre for Scientific Culture, National Institute of Nuclear Physics, Consiglio Nazionale delle Ricerche.
UK	The Royal Society
Czech Republic	The Academy of Sciences of the Czech Republic
Hungary	The Academy of Sciences
Norway	University of Oslo, Bergen University
Spain	Spanish High Council for Scientific Research, Madrid Polytechnic University
Sweden	Royal Academy of Sciences, Royal Swedish Academy of Letters, History and Antiquities
Switzerland	World Agency for Planetary Monitoring and Earthquake Risk Reduction

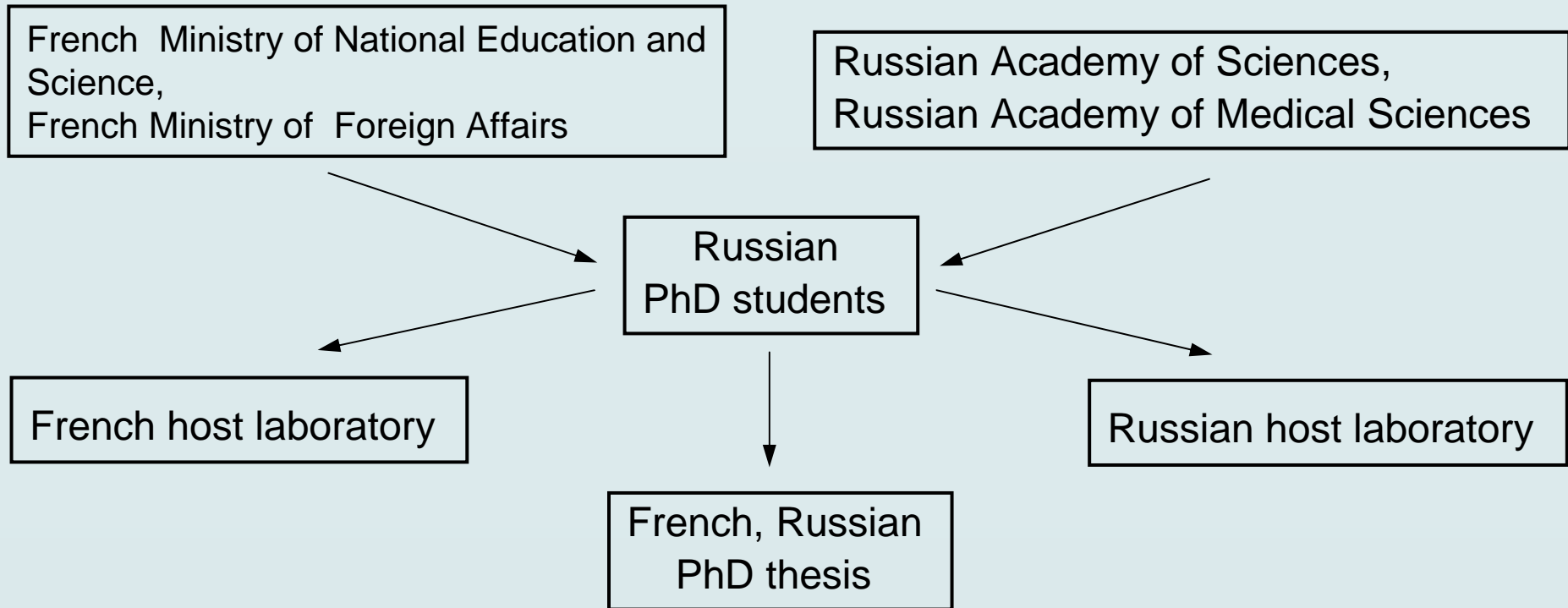
CNRS – RAS

10 Joint French-Russian Laboratories

20 French-Russian (European) Networks

FRENCH-RUSSIAN PROGRAM

"Postgraduate training of Russian young scientists"
(1994-2009)



Agreement: Over three years, Russian young scientists stay annually for six months in a French laboratory and for six months in a Russian laboratory contributing to the joint collaborative project.



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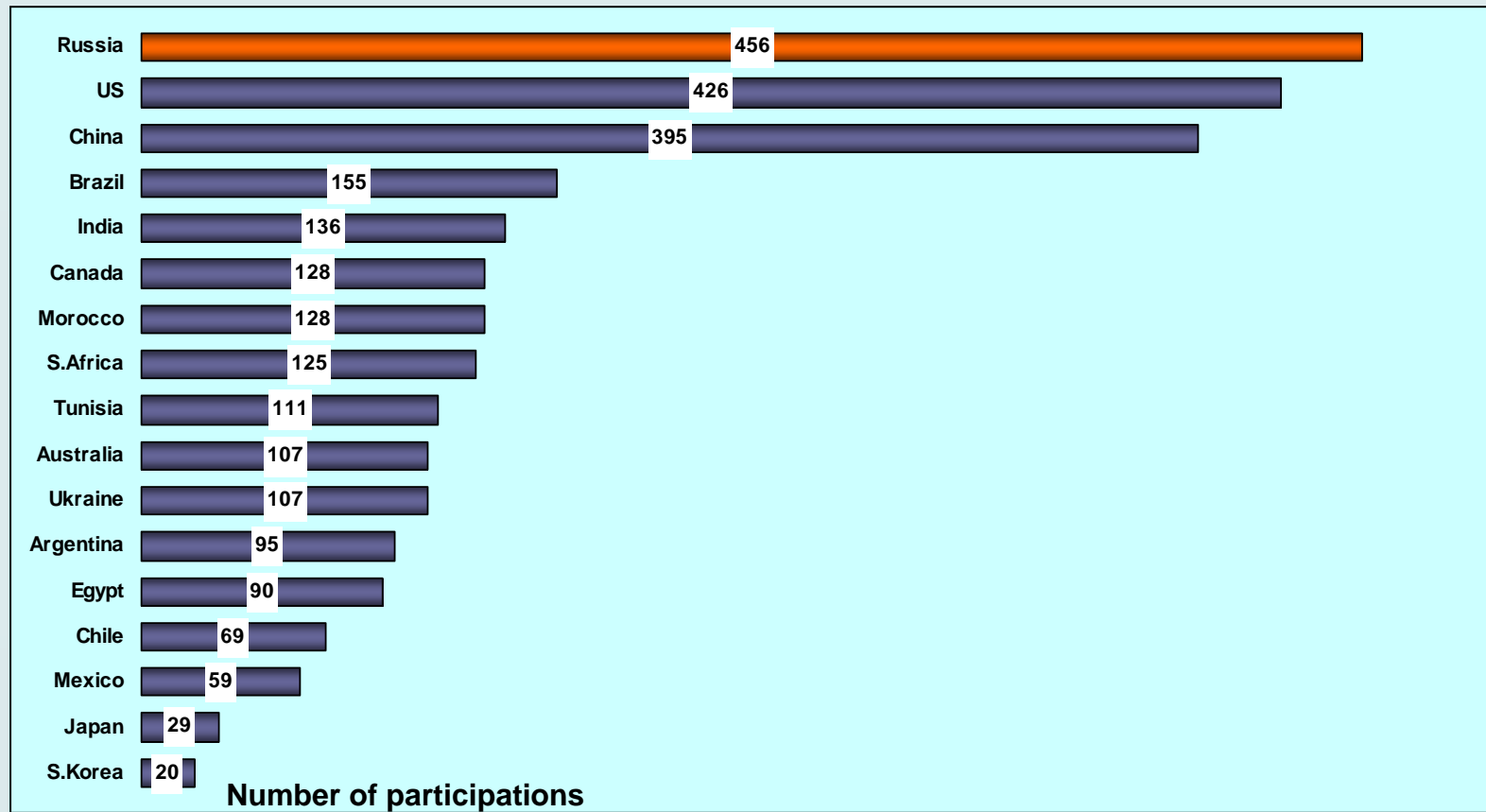
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PARTICIPATION IN FP6 OF MOST SUCCESSFUL THIRD* COUNTRIES (2002-2006)



*Non-members of the EU

OVERALL RESULTS OF PARTICIPATION OF RUSSIA IN FP6

455 Number of Russian organizations supported by FP6

268 Number of projects in FP6 with the Russian partnership with the total funding

2.8 B€ Total funding of the projects with the Russian participation

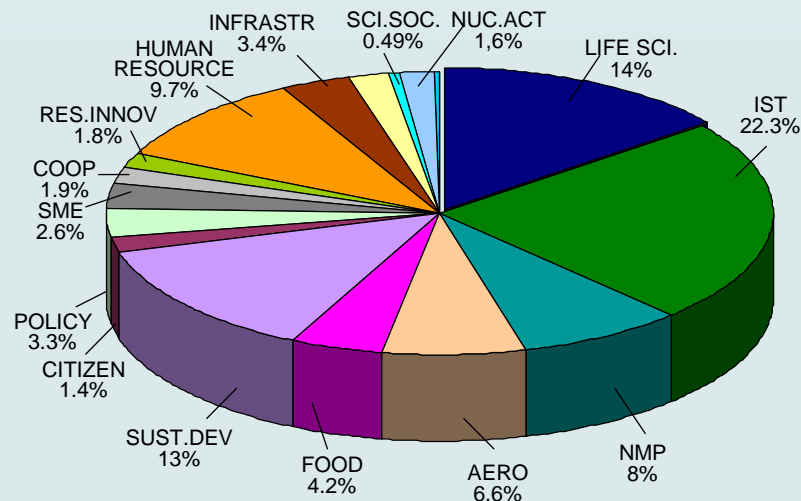
50 M€ Total funding of Russian participants in FP6

1.8% Average funding of Russian participants per project

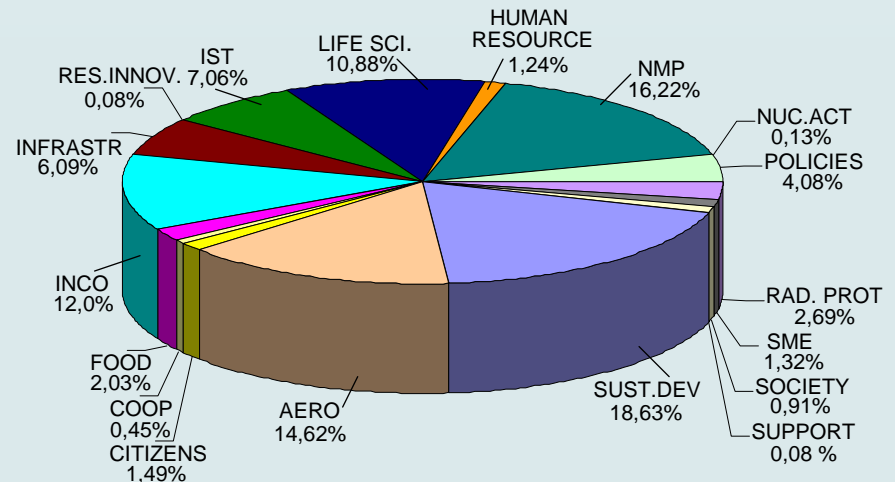
1 : 1 ÷ 4 Contribution of non-RAS and RAS organizations to FP6 estimated by:

- ✓ The number of projects;
- ✓ The number of Institutes;
- ✓ Funding

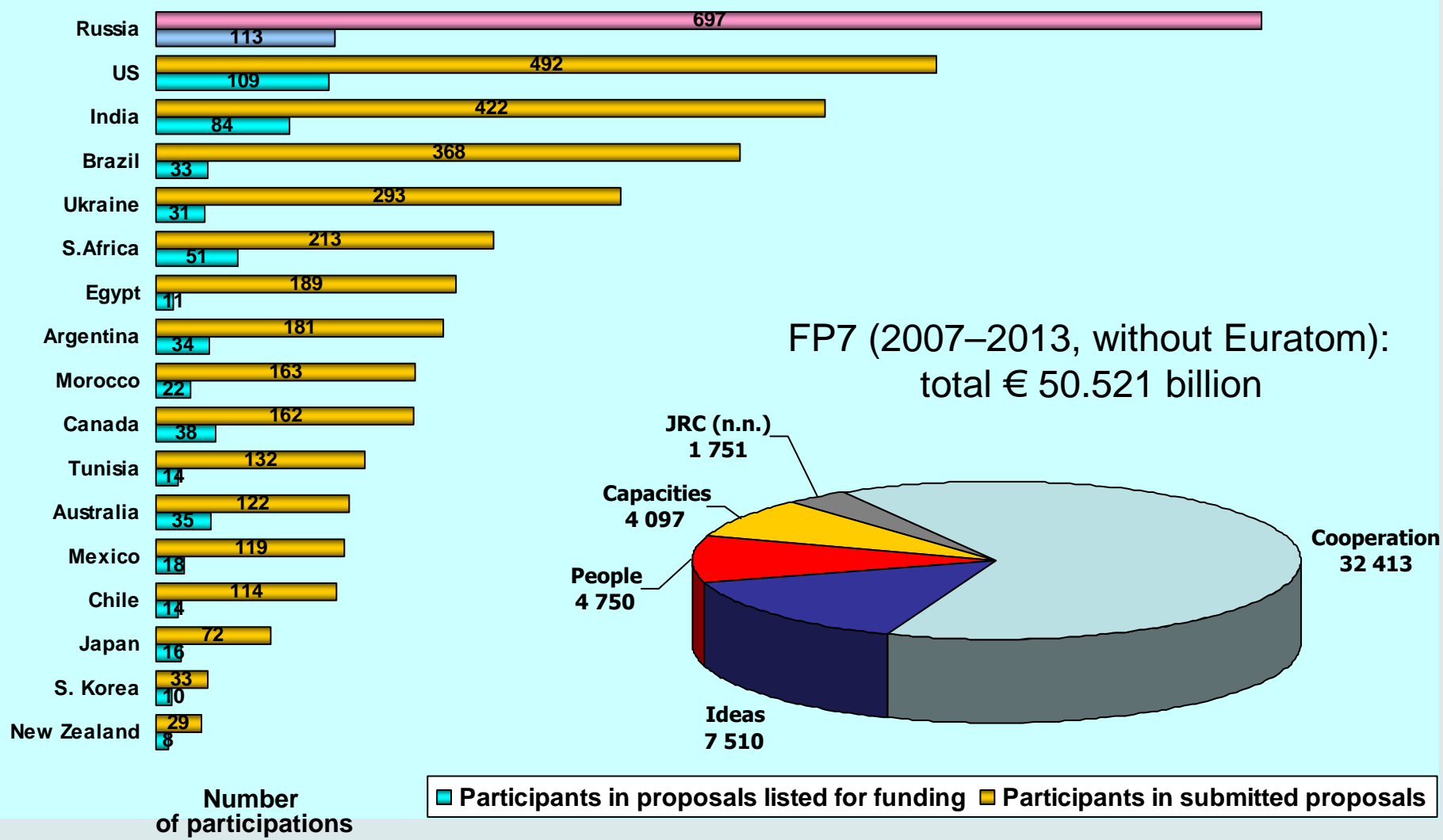
Distribution of FP6 budget (17 883 M€)



Funding of Russian participants of FP6



FP7: BUDGET, PARTICIPATION OF THIRD COUNTRIES* Cooperation and Capacities Programs, first call



*Non-members of the EU

COOPERATION OF THE RUSSIAN ACADEMY OF SCIENCES WITH THE EUROPEAN UNION IN FRAMEWORK PROGRAMS

In the FP6, RAS:

- Was responsible for two National Contact Points;
- Delegated leading scientists to expertize the projects;
- Delegated the RAS representatives to four Russian committees promoting cooperation of Russia with the EU countries in nanosciences and nanotechnologies, non-nuclear energy, medicine and health, and food safety;
- Delegated the RAS representatives to the EU-Russia Committees.

In the FP7, RAS would:

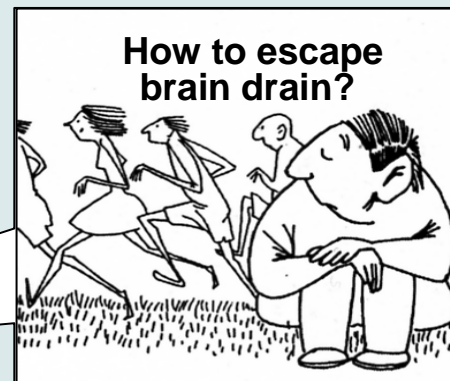
- ❖ Maintain the same responsibilities as in FP6;
- ❖ Join the activity line coordinated by European Research Council;
- ❖ Establish National contact points for the programs “ENVIRONMENT” and “IDEAS”.



The objective of the specific program 'IDEAS' and RAS is to reinforce excellence, dynamism and creativity in European research and improve the attractiveness of Europe for the best researchers



RAS





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What is the prospect for Russia
to be an associate member of FP7



Major points for discussion:

- Annual registration fee
- Rights of potential Russian members in the executive committees of FP7
- Relations with ERC and the program IDEAS

What might be done to increase the efficiency of the RAS in international cooperation ?

It would be reasonable:

- To re-establish a network of the RAS representatives in the Russian agencies and international and national scientific organizations in the European countries
- To re-organize the departments of foreign affairs in the RAS institutes according to the requirements of the open market and to strengthen their relations with the department of foreign affairs of the RAS Presidium;
- To create the RAS foundation or the targeted program of the RAS Presidium for supporting international projects under competition;
- To promote a creation of international laboratories and networks on a priority basis serving to increase the efficiency of basic research and to develop new technologies;
- To diminish brain-drain and to promote brain-gain by using the opportunities of different Russian and international foundations and programs including RFBR, Mobility (FP7), etc.;
- To extend the program for training of Russian and foreign PhD students under co-supervision in the frame of the joint international projects;
- To construct “guest-houses” in the principal centers of RAS for accommodation of PhD students and visiting researchers;
- To strengthen cooperation with FP7 by entering as an associate member and creation of the national Contact Point IDEAS.



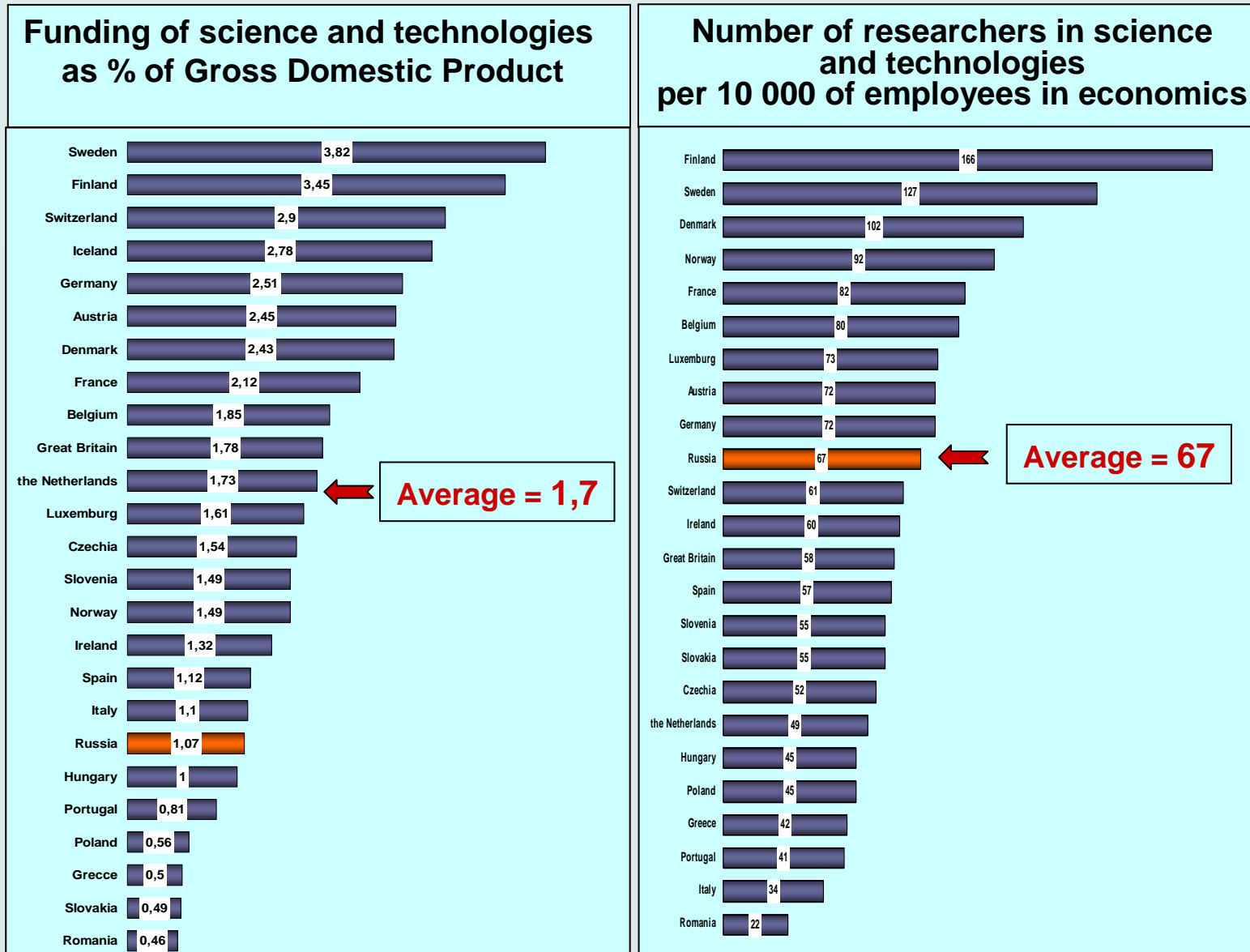
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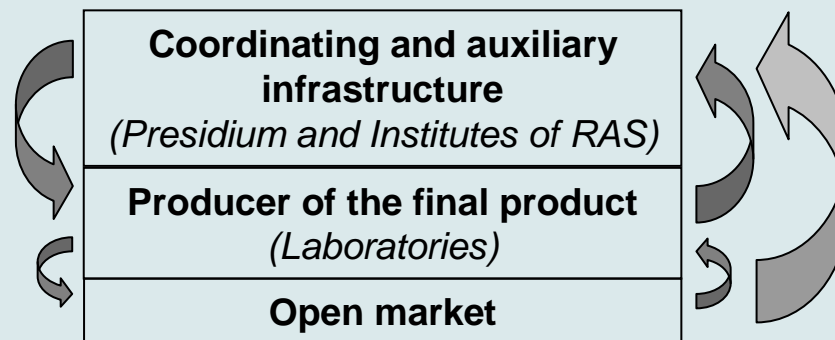
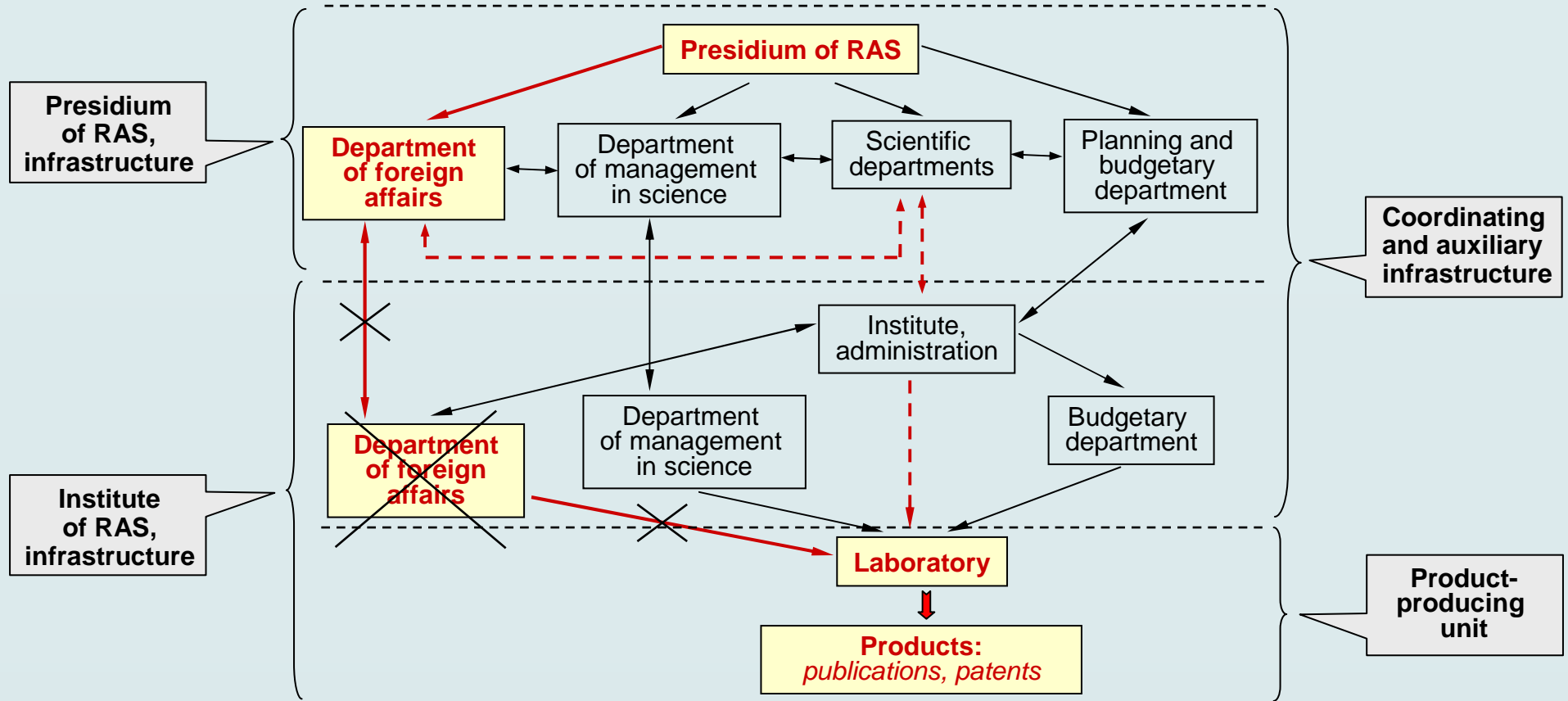
Thanks for your attention

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FINANANCIAL AND HUMAN RESOURCES IN SCIENCE AND TECHNOLOGIES IN RUSSIA AND EUROPEAN COUNTRIES*



RAS: MANAGEMENT INFRASTRUCTURE



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Acknowledgements

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