Linking Russia to the ERA: Coordination of MS'/AC' S&T programmes towards and with Russia

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1 Executive Summary

This report constitutes Deliverable 1.2.1 "The Russian S&T and innovation funding system from the point of view of international cooperation". It was drafted in the frame of Work-Package 1 of the ERA.Net RUS project, which is funded under the EU's FP7.

In this report the current status of S&T funding, its decision making processes and the regulatory framework are outlined. The different funding sources (government, business, abroad, higher education, private non-profit) of Gross Domestic Expenditure on R&D (GERD) are discussed, a typology of funding instruments proposed and key trends analysed. A Strengths and Weaknesses analysis (SWOT) shall help to better understand current trends in Russian S&T and innovation funding. In the final chapter Russian S&T programmes' accessibility for foreign scientists, especially from the EU Member States (MS) and Associated Countries to FP7 (AC) is discussed.

Gross Domestic Expenditure on R&D (GERD) reached in 2008 in Russia 431.07 billion Russian Roubles (RUB), which is expressed in EURO 11.8 billion (EUROSTAT, 2010).
In difference to most EU countries, expenditure is in Russia largely dominated by the government and shows even an increasing trend: 65% of GERD are provided by the government. But most of R&D is performed in the Business & Enterprise sector. This specificity of the Russian S&T system can be explained by the fact that a substantial range of research institutes are organised as fully or partly state owned companies and that several research intensive companies are publicly owned.
The Higher Education sector accounts only for a minor contribution to R&D funding and performs in comparison to competitor countries a much lower share of R&D. The Private Non-Profit sector is negligible in Russia, what concerns funding as well as performance of R&D.

The volume of funding for R&D and innovation has over recent years remarkably increased. New substantial competitive funding programmes (Federal Targeted Programmes - FTPs) have been introduced. The Foundations for competitive R&D funding, the Russian Foundation for Basic Research (RFBR), the Foundation for Assistance to Small Innovative Enterprises (FASIE) and the Russian Foundation for Humanities are key partners for many S&T organizations and have acquired a good level of trust.
Infrastructure for applied research and innovation and respective funding tools are getting improved and have been developing especially over recent years. This concerns for example regional venture funds, Rusnano, SEZs, Russian Venture Company (RVC), Technology Transfer Offices (TTOs), FTPs, tax breaks.

But still too few funds are allocated via competitive programmes of the foundations (RFBR, RFH, FASIE). Competitive funding allocation is hampered by the Russian public procurement/tendering law #94, which is too rigid in its rules. This concerns elements such as timing of tenders and evaluation criteria.
A complaint of scientists concerns the fact that in Russia many funding programmes require a heavy paperload and that they are too bureaucratic. Limited competition in some programmes as well as limited capacities for R&D funding of companies is another weak point.

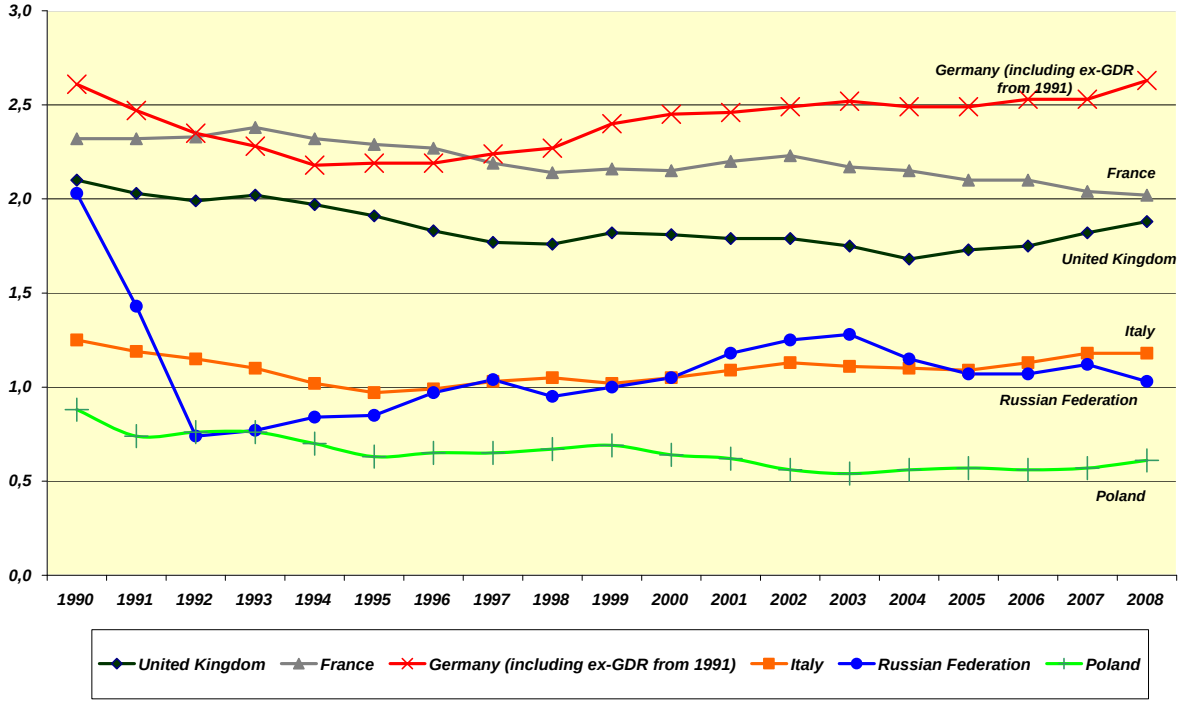
2 Introduction

The analysis shows that during the period of reforms, the Russian R&D sector became one of the areas negatively affected by the transformation to a market economy. The key evidence is an unprecedented decline in funding of R&D and innovation activities and in R&D staff (until the mid-1990s). It has led to a worsening of the institutional environment for the R&D organisations, deterioration of their resource base and of their position in international R&D and on high-technology markets.
Economic growth and budgetary trends in economies in transition are quite different from the persistent conditions in a state controlled economy. During a transition period the importance of targeted impact in certain areas and corresponding medium and long-term obligations of the government increases. Since the level of the Russian government interference remained traditionally high, transformation of S&T and education spheres would probably have been painful even without the crisis. The "revision" of the traditional national priorities and the Government's incapability to fulfil many of its previous commitments led to a corrosion of relevant motivation factors for scientists as well as for the overall Russian S&T sector such as social obligations, defence interests, and national prestige.[1]

One of the most important science indicators and an important international benchmark is Gross Domestic Expenditure on Research and Development (GERD) expressed as a share of Gross Domestic Product (GDP). In the years after the dissolution of the Soviet Union, Russia saw a sharp decline of this indicator from slightly over 2% to a low of 0.74% in 1992. The indicator started then to grow again and in the period 1995 - 2003 it increased from 0.85% to 1.28%, although the financial crisis in Russia in 1998 caused a setback in growth for two years. In 2004 the indicator decreased again to the level of 1.07% and it remained since then more or less at this level of slightly above 1% of GDP.
Compared to big EU countries, Russia reached on this indicator in the early 1990s the level of UK. But spending declined in a short period drastically to reach in 1992 the level of R&D spending as a share of GDP similar to Poland. Since then it has risen to levels of Italy.

[1] Kitova , G., Kuznetsova, T. (2003) The effect of science policy without mutual understanding: correlation of theory & practice // Studies of science, 2003. № 3 (in Russian).

Figure 1. Comparison of GERD as a percentage of GDP 1990-2008



Source: *EUROSTAT, 2010.*

In absolute figures in 2007 GERD amounted to RUB 371.08 billion, which was expressed in € 10.597 billion (and RUB 5567.4 thousand in constant 1989 year prices). According to the statistical data, budget spending on science began in the mid-1990-ies to grow again after the steep cuts in the immediate post-Soviet Union phase. In 1996 and 1997 it grew in constant prices by 9.5% annually, but this was terminated already in 1998 due to economic crisis. The short setback was followed by subsequent growth in the course of 1999 to 2003: on average by 13% annually. In 2004 and in 2005 GERD in constant prices decreased again (by 3.9 and 1.2%, correspondingly), and only during 2006-2007 it grew by 8.1% and 13.2%. As of 2007, Russia still did not reach the level of science spending, which could be observed in 1991, when the Soviet Union was dissolved.

Table 1. GERD (thousand RUB; before 1998 in million RUB)

	1995	1997	1998	1999	2000	2001
In current prices	12149458.6	24449691.2	25082065.6	48050525.0	76697100.5	105260731.6
In constant prices of 1989	2485.4	2980.5	2578.1	2863.1	3321.2	3912.6

	2002	2003	2004	2005	2006	2007
In current prices	135004491.9	169862369.1	196039870.2	230785150.3	288805211.5	371080327.1
In constant prices of 1989	4344.7	4795.2	4608.0	4550.9	4918.0	5567.4

Source: *HSE, Science Indicators, Moscow, 2009*

The most important source of funding of Russian science has been traditionally the state budget. According to the data of 2007 the state budget covered 62.6% of GERD. State funds include budgetary funds, budgetary appropriations, funds for universities and organizations of the state sector (including own funds). At the same time the system of state funding of science is characterised by nearly 100% dominance of the federal budget, while regional R&D funding is still very limited. For instance, in the 2008 consolidated state budget, appropriations for applied science (R&D) amounted to RUB 75.5 billion, of which RUB 72.8 billion from the federal budget and RUB 2.7 billion from regional budgets.[2]

During 1995–2007 the state budget funds grew by 2.3 times (in constant prices). In current process the amount of state funds reached RUB 232.4 billion, which is twice as high as funds from the business sector, which grew in 2007 to RUB 109.3 billion (29.4% of the total volume of funds). Business sector funds regroup funds from non-budgetary foundations and business sector as such (incl. own funds). In line with the methodological explanatory notes of the Federal Committee on State Statistics, the business sector includes all organizations, which main activity is linked with production of goods or services for sale, including those, owned by the state; private non-for-profit organizations, servicing these organizations. In other words, the business sector includes the greater part of applied science, in particular sectoral scientific organizations, many of which exist in the form of state unitary enterprises.

While R&D funding in Russia is largely dominated by the government, most of R&D is performed in the Business & Enterprise sector. This specificity of the Russian S&T system, which is different to funding and performance patterns in most EU countries, can be explained by the fact that a substantial range of research institutes are organised as fully or partly state owned companies and that several research intensive companies are publicly owned.

The Higher Education sector accounts only for a minor contribution to R&D funding and performs in comparison to competitor countries a much lower share of R&D. The Private

[2] Source: data of the Federal Service of State Statistics http://www.gks.ru/

Non-Profit sector is still insignificant in Russia, what concerns funding as well as performance of R&D. Funding for R&D from abroad provides 6% of GERD, but this share has been declining over the last years. For details of the funding and performance patterns see in Annex 9.3 an overview diagram on flows of R&D funding in Russia.

Thanks to strong economic growth with GDP growth rates of around 6% over the years up to 2008, Russia was able to invest in absolute figures substantially more funds in the S&T sector.
New competitive funding programmes, so-called Federal Targeted Programmes were introduced for stimulating specific thematic priorities (e.g. nanotechnologies) or general priorities of the R&D sector (e.g. human resources, enhancing research at universities). Federal Targeted Programmes are conceived multi-annually and come with substantial budgets. New funding programmes were also introduced to strengthen specific priorities of the R&D sector, such as programmes for enhancing research at universities.
The economic situation helped to strengthen a policy shift to more competitive and project based allocation of R&D funding in Russia. In 2005 around 25% of the civil governmental R&D funding was allocated competitively. The share of competitive funding is constantly increasing, with a tendency towards 50% of civil governmental R&D funding in current years and a planned further increase up to 70%.[3] These are ambitious goals, but it should also be noted that effective competition is in some sectors still rather limited.
In 2009 the financial crisis has also hit Russia and cuts of up to 30% had to be implemented on planned R&D budgets. In 2010 and the coming years the Russian economy is set to grow again and budget inflows into R&D accordingly, especially as a modernisation of the economy based on S&T and innovation is high on the policy agenda.

In the following chapters, first an overview of the decision making procedure on the S&T and innovation budget and the involved institutions is provided. This is followed by a description of the regulatory framework for S&T and innovation spending and of reform trends in this field. A typology of funding instruments gives a structured overview of instruments, which are at present available in Russia for support of S&T and innovation. The current status of public, private and regional funding is then highlighted and key reform trends in budgeting are outlined. In a SWOT analysis it is tried to bring forward the Strengths and Weaknesses of the current S&T and innovation funding system, including on international cooperation programmes. Finally it is referred to the Russian funding programmes, which are relevant for cooperation with EU Member States and Associated Countries to FP7.
This report does not provide a detailed description of Russian S&T and innovation funding bodies, as this is covered already in the ERA.Net RUS analytical report 1 on the "Russian S&T system".[4]

[3] OECD, STI Outlook 2008 – Policy Questionnaire: The Russian Federation.
[4] The ERA.Net RUS report 1 on the "Russian S&T system" is accessible at www.eranet-rus.eu

3 R&D Budget decision making

Decision making on the federal R&D budget concerns certain procedural aspects, which involve a broad range of public actors and which are guided by legal framework conditions for the R&D budget.

3.1 The federal R&D budgeting procedure

The consolidated Russian budget, consisting of federal and regional components, is shaped by the Government of the Russian Federation. The main parameters of the budget comply with the annual *Budget Message* of the Russian President. The budget for the subsequent financial year is introduced by the Government to the State Duma (lower chamber of the Russian Parliament) before 26 August of the year preceding the budgetary year. The State Duma passes the budget in three readings. After the first reading (30 days) the main budget parameters are adopted. After the second reading (35 days) the main categories of budget appropriations are adopted. In the course of the third reading (15 days) sub-categories are defined and the departmental cost structure is precised. After the budget is adopted by the State Duma, it is considered for 14 days by the upper chamber, the Council of Federation. After adoption of the budget law, it is passed on (within 5 days) to the President for signature and subsequent publication.

MES has the largest part of S&T budget at disposition; it manages most S&T Federal Targeted Programmes, which are distributed through competitive tendering procedures. The Ministry manages the state university budgets, including their R&D budgets. Several other R&D funding tools exist, such as block grants to its 5 subordinated organizations[5].
Other ministries dispose also of relevant S&T budgets. This concerns mainly the Ministry of Defence, the Ministry of Economic Development, the Ministry of Industry and Trade, the Ministry of Information Technologies and Communication, Ministry of Health, Ministry of Agriculture.

Several S&T related budget categories are based on longer term agreements or legal regulations. The Russian Academy of Sciences has a budget category in the federal budget, the amount of which is based on an agreement with the government currently running for the years 2008-2012.[6] The Federal Space Agency, Rosatom (the State Corporation for Atomic Energy), and the National Research Centre Kurchatov Institute also have their block funding included as positions in the federal budget.

The three main S&T foundations, tasked with support to various R&D units and individual researchers through grant competitions, get fixed percentages of the Russian civilian R&D budget allocated:

- The Russian Foundation for Basic Research (RFBR) is entitled to 6% of the annual civilian R&D budget.
- The Foundation for Assistance to Small Innovative Enterprises (FASIE) is entitled to 1.5% of the civilian R&D budget.
- The Russian Foundation for Humanities (RFH) is entitled 1% of the civilian R&D budget.

Certain public R&D and innovation development institutions, such as Russian Corporation of Nanotechnologies (Rusnano) and the Russian Venture Company (RVC), also contribute their share to the annual R&D expenditures, as state-created programme owners. These bodies

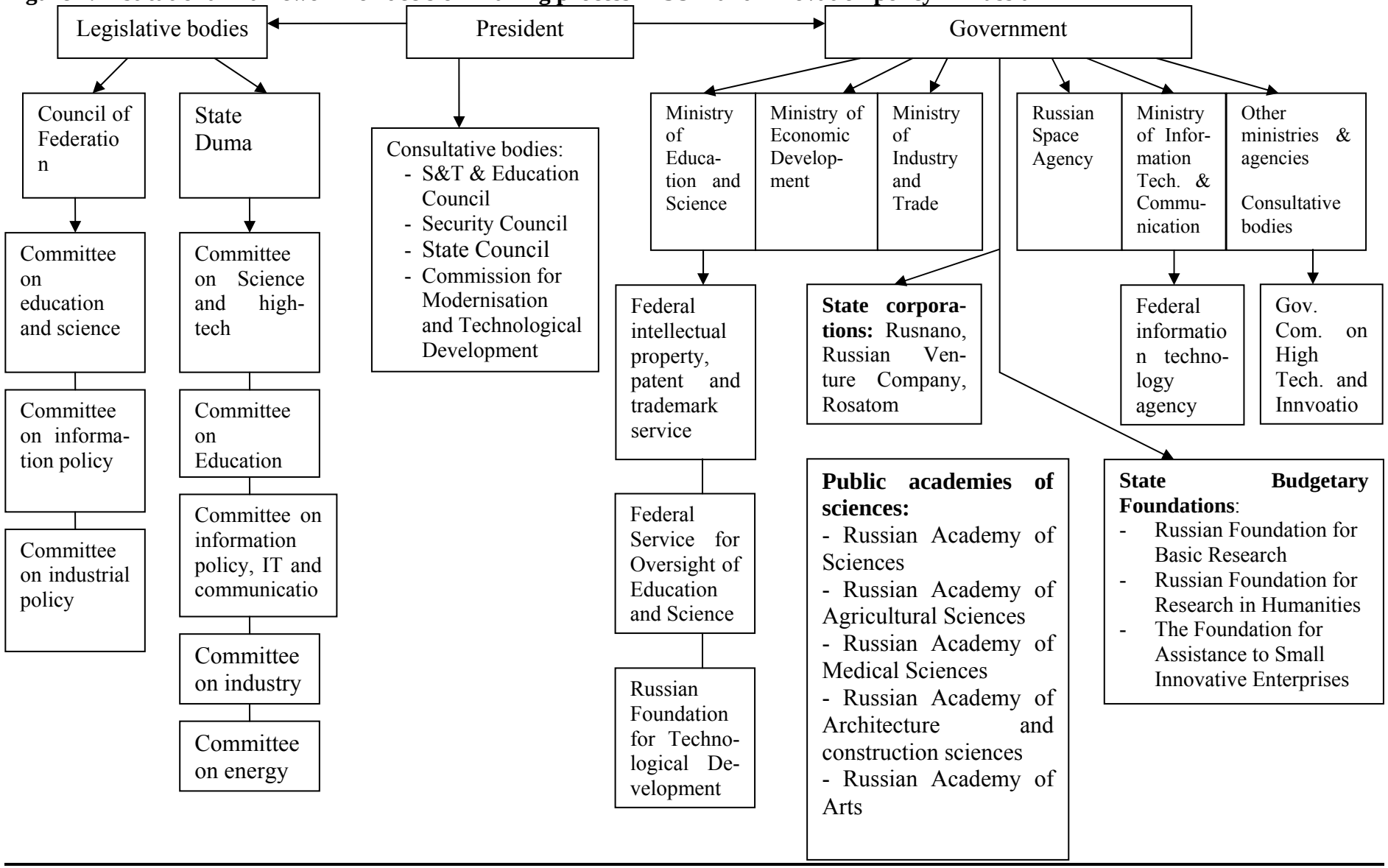
[5] http://mon.gov.ru/str/ved/
[6] The Fundamental Scientific Research Programme for the Academy sector foresaw for example in 2008 an allocation of RUB 46.69 billion (€ 1.33 billion).

were created in line with special laws and their statutory capital was formed through contributions from the state budget.

3.1.1 Institutions involved in the federal R&D budgeting procedure

A broad range of institutions with either policy making, coordinative, executive or operational functions are involved in the budgeting procedures. Figure 2 below shows a structural overview of the national governance system of S&T and innovation in Russia.

Figure 2. Institutional framework for decision-making process in S&T and innovation policy in Russia



In the following the involved institutions have been categorised into policy making, executive, coordinative and operational level. It needs to be noted although that the borders between these categories are blurred; for example the Ministry of Education and Science has been put to the executive level, but it fulfils at the same time important policy making and coordinative functions. This overlap of functions holds also true for several other public bodies, involved in S&T governance.

The policy-making level of governance includes:

President of the RF – provides for coordinated functioning and interaction of all state authorities, defines key directions of state S&T and innovation policy in his decrees and orders. The annual S&T priorities of the President are outlined in annual messages to the Federal Assembly of the RF, which then feed into legislative action plans of the Parliament and the Government.

The President gets support from consultative bodies – **State Council of the RF** and a more narrowly focused **Council by the President on Science, Technology and Education**. The latter undertakes expertise of federal bills and other regulatory acts on state S&T and innovation policy and, subsequently, formulates its proposals. The Council also develops recommendations to the President on interaction of the Russian Academy of Sciences (RAS), sectoral academies, other Russian S&T and educational organizations with foreign and international S&T and educational organizations and joint cross-border projects.

Another policy shaping and advisory body, which is linked to the presidential apparatus, is the **Commission for Modernisation and Technological Development** of Russia's Economy. It was established only in May 2009 and underpins the fact that President Medvedev is pushing the topic of an R&D and innovation based modernisation of the Russian economy. The commission has around 20 members. It is headed by President Medvedev and includes relevant ministers for the R&D and innovation sector (e.g. Minister of Education and Science, Minister of Economic Development, Minister of Finance), heads of private companies, directors of public research intensive companies (Rosatom, Rostechnologii), research institutes (Kurchatov institute), and of innovation support structures (Rusnano), etc. The commission deals with:

- issues that shape public policy for modernisation and technological development of Russia's economy;
- it coordinates activities of public executive bodies, companies and experts in this field;
- it defines the priorities, forms and methods of regulation in this field.

The Governmental Commission on High-Tech and Innovations was created by the Resolution of the Government from 12 September 2008 #667 and is chaired since March 2010 by Prime Minister Vladimir Putin, who has taken over the lead from deputy Prime Minister Sergey B. Ivanov. This change illustrates the overall current priority that the Russian top leadership puts on a modernisation of the economy through R&D based innovation.

The Commission is a standing coordination body and was formed in order to assure coordinated activity of federal executive bodies and their interaction with executive bodies of Russia's regions, state academies of science, civil society organizations, scientific organizations and other stakeholders in development of proposals in key areas of state policy on S&T and national innovation system[7].

The Commission tackles the issues of S&T sector reform, funding, legal and regulatory provisions. Decisions of the Commission within its mandate are obligatory for execution by all of its members – state bodies. Information and analytical support to Commission's work is

[7] Terms of reference for the Commission on High-Tech and Innovation, http://www.government.ru/content/coordinatingauthority/ivanov/psnnt/poloshenie/

provided by the Ministry for Education and Science of the RF, and all the administrative work is done by the office of the Government of the RF.
The Commission is composed of all federal ministries and agencies, which deal with civil and defence S&T (Ministry of Education and Science, Ministry for Economic Development, Ministry of Defence and other), Ministry of Finance, Office of the Government, Russian Academy of Sciences, business associations and business groups, state corporations and other development institutions (Russian Venture Company, Rusnano, etc.), universities, Russia's regional administrations and Russian Parliament.

The issues which fall under the responsibility of the Commission are:

- Long-term S&T forecasting (foresight);
- Development of nanotechnologies and nanoindustry, development of a market for nanoproducts and nanoservices;
- Stimulation of demand from the real economy for high-tech and innovation;
- Development and raising the effectiveness of R&D; coordination and efficiency of R&D funding;
- Increase of investment attractiveness of innovation sphere and high-tech sectors of the economy;
- Advancement of PPP mechanisms in the sphere of high-tech and innovations.

The **Federal Assembly of the Russian Federation**, composed of two chambers – the **Council of the Federation** and the **State Duma** - also belongs to the policy making level**.**[8]
The State Duma of the RF (lower chamber) passes federal laws, including the law on the federal budget of the RF, which are then considered and approved by the Council of Federation (upper chamber), and finally go the President of the RF for signature and promulgation.
The legislative activity on S&T and innovation is coordinated by the thematic committees of both chambers:

- **Committee of State Duma on Science and R&D;**
- **Committee of the State Duma on Information Policy, Information Technology and Communication;**
- **Committee of the State Duma on Education;**
- **Committee of the Council of Federation on Science, Education, Healthcare and Environment**[9].

The executive level of governance:
The executive level assures a unified implementation of national policy on science and education. It takes also care of setting precise policy tasks, development of work programmes, coordination and oversight over implementation of decisions.
The executive level involves the **Government of the RF, federal Ministries and agencies**, as well as **Russian Academy of Science**.
The **Government of the RF** develops the federal budget and proposes it to the State Duma. It assures due execution of the budget, including in the area of S&T policy; and provides for a joint state S&T policy. The **Prime Minister** defines the directions and organises the work of the Government. Regulatory work in the area of S&T remains in the responsibility of

[8] The right of legislative initiative belongs to the President of the RF, Council of Federation, members of the Council of Federation, deputies (members) of State Duma, Government of the RF, legislative (representative) bodies in Russia's regions, Constitutional Court of the RF, Supreme Court of the RF and Higher Arbitrary Court of the RF.
[9] Inter alia, this committee is tasked with legislative provision: continuous and additional education; S&T and innovation activity; state S&T policy; IPR in the area of S&T; state financial support to education and science professionals, budgetary funding for education and S&T, etc.

thematic ministries. **Thematic departments of the Government Office** are tasked with provision of Government's activity, as well as interaction with thematic federal ministries and federal agencies. Governance of S&T is in the responsibility of four thematic departments:

- Department of culture and education of the Government of the RF;
- Department of defence industry and high-tech of the Government of the RF;
- Department of sectoral development of the Government of the RF;
- Department of priority national projects of the Government of the RF.

There are a number of **consultative and coordinative bodies by the Government** of the RF, which provide for interaction among the federal executive authorities, executive authorities of Russia's regions and other organizations in order to implement the common state policy in the sphere of S&T and innovation. The following commissions by the Government are part of S&T governance system:

- Governmental commission on countering the violation of IPR, its protection and use;
- Governmental commission on high-tech and innovations (described in detail above in section policy making level);
- Military industrial commission by the Government of the RF;
- Governmental commission on investment projects of national importance.

An important policy making, executive and coordinative role in the area of S&T and innovation belongs to the **Ministry of Education and Science of the Russian Federation** (MES or Minobrnauki).[10] The Ministry makes and executes policy, as well as assures normative and legal regulation in the areas of education, science, technology development and innovation activity, development of federal science and high-tech centres, state science centres and science cities, and Intellectual Property Rights (IPR). The Ministry submits to the Government federal bills, draft regulatory acts, and develops federal targeted programmes.

The work of the Ministry of Education and Science is governed by the Constitution of the Russian Federation, Federal Constitutional Laws, Decrees by the President of the Russian Federation, international agreements signed by the Russian Federation as well as the Statute of the Ministry of Education and Science of Russia.

The Ministry works in cooperation with other federal executive bodies, executive bodies of the subjects of the Russian Federation[11], local authorities, public associations and other institutions. Minobrnauki closely cooperates with the **Ministry for Economic Development** (Mineconomrazvitiya) and **Ministry for Industry and Trade** (Minpromtorg), as well as agencies subordinated to these ministries: **Federal Agency for Technical Regulation and Metrology** (subordinate to Minpromtorg) and **Federal Agency for Management of Special Economic Zones** (subordinate to Mineconomrazvitiya).

MES has the following objectives and responsibilities:

- To guarantee the availability of quality education for all social groups of the Russian society as a basis for social mobility and essential means to decrease the socio-economic differentiation of the society.
- To secure training and availability of professional personnel with required qualifications for current and forthcoming social and economic needs of the society, and ensure the development of continuous education.
- To ensure necessary requirements for active participation of children of all education establishments in economic, social, political and cultural spheres of society.
- To provide all necessary measures for the development and effective use of the S&T potential.

[10] The Russian Ministry of Education and Science was established on March 9, 2004 by the Decree of the President of the Russian Federation N 314.

[11] Subjects of the Russian Federation are 46 regions (oblast'), 21 republics, 4 autonomous districts (okrug), 9 territories (kray), 2 federal cities (Moscow, St. Petersburg) and 1 autonomous region (avtonomnaya oblast').

- To secure all necessary measures for innovation development.

As of 2010 Minobrnauki co-ordinates and controls the work of two agencies, which are subordinated to it:

- **Federal Service for Intellectual Property, Patents and Trademarks (Rospatent);**
- **Federal Service for Oversight of Education and Science (Rosobrnadzor).**

Although the Ministry for Education and Science has had responsibility for negotiation at the federal level of the proportion and amounts of R&D and Education funding within the state budget, and responsibility for overall budget supervision, it was not before 2010 when the Ministry acquired responsibility for budget allocation and distribution. This was a result of the fact that two major agencies for R&D and education policy implementation, the Federal Agency for Science and Innovation (FASI or Rosnauka) and the Federal Agency for Education (Rosobrazovanie) were disbanded in spring 2010. These two agencies were subordinated to Minobrnauki and are being reintegrated into the Ministry. Minobrnauki has gained herewith significantly in importance in policy implementation, as especially Rosnauka was responsible for allocating substantial funds for R&D through Federal Targeted Programmes and other support schemes.

At the level of executive authorities an important role in S&T management belongs to the **Federal Space Agency** (Roscosmos), which assures regulatory and legal activity, provision of state services and management of state property in the space sphere. Roscosmos is responsible for international cooperation in implementation of joint projects and programmes in the space sphere, and for R&D in the sphere of military rocket-and-space equipment by rocket-and-space organizations. Roscosmos is not subordinated to any ministry, but directly to the Government of the RF. Roscosmos receives substantial institutional funding and manages the Federal Space Programme, the main funding programme for the space sector.

The executive level also includes the **Russian Academy of Sciences** (RAS). The Academy is a self-governed non-commercial governmental organization, which is aimed at organization and undertaking of fundamental research, contributing to technological, economic, social development of the RF. RAS is structured according to scientific and sectoral principles. The Academy provides annual reports to the President and the Government of the RF, featuring its scientific activity, S&T activity results, as well as proposed priority directions for development of fundamental and applied sciences. The Academy absorbs approximately a third of the Russian civilian R&D budget; its main funding source is the Fundamental Scientific Research Programme for the Academy sector for 2008-2012.

In the area of nuclear energy policy and research the main player is the **state corporation for nuclear energy "Rosatom"** (State corporation "Rosatom"), which regroups over 250 enterprises and R&D organizations, including all civilian enterprises of the Russian nuclear energy sector, enterprises of nuclear defence section, R&D organizations and the unique nuclear icebreaker fleet. The State Corporation "Rosatom" is the largest power generating company in Russia, which provides for over 40% of electricity in the European part of Russia.

All these three main players of the Russian S&T sector – Roscosmos, RAS and Rosatom - are strongly involved in policy making and policy execution, but are also major operational R&D organisations.

Other relevant executive bodies are the three funds for allocation of R&D funding through competitive call procedures: the Russian Foundation for Basic Research, the Foundation for

Assistance to Small Innovative Enterprises and the Russian Foundation for Humanities. Funds dealing with venture support for innovations are Rusnano and the Russian Venture Company.

Coordination level of S&T governance:

The coordination level defines the tasks of the S&T system development in general, as well as of particular high-tech industries. Funding schemes and Federal Targeted Programmes (FTP) are developed at this level. The volume and distribution scheme, as well as the timeline for funding are specified accordingly. Specific measures for implementation of S&T and innovation policy are also developed at this level, including tasks for particular project institutions and organizations, distribution of budgetary funding to FTP implementing organizations, control over execution of measures, foreseen by the S&T Development Strategy and over FTP implementation.

The coordination level of S&T governance includes particular departments of ministries and agencies, which place state orders and FTP coordinators, as well as governing bodies of state corporations and development institutions (i.e. Joint Aviation Corporation, state corporation "Rostechnologii", "Rusnano", etc.).

Operational level of S&T Governance

This level includes specific S&T institutions, educational centres, universities, commercial and non-commercial organizations, which are key contractors and sub-contractors of national projects and FTP adopted by the Government of the RF.

3.2 Regulatory (legal) framework

After 2000 Russian government policy became clearly oriented towards promoting innovation and sustainable economic development. The favourable market situation, macroeconomic and political stability allowed to develop and implement a wide range of measures aiming at a modern National System of Innovation (NSI) and faster development of high-technology sectors of the economy. The wide understanding of innovation and the new approach to NSI were created evolutionary and have been fixed in key policy documents only in recent years. The main legal and regulatory documents on the NSI and the legal basis for funding of R&D are the following:

- R&D and Innovation Development Strategy in the Russian Federation until 2015 (2006). Approved by Interdepartmental commission on R&D and innovation policy on 15.02. 2006 (protocol № 1) (in Russian).
- Concept of Long-Term Socio-Economic Development of the Russian Federation until 2020 (CLTD, 2008). Ministry for Economic Development. The RF Government Regulation of 17.11.2008 № 1162-r (in Russian).
- Basic directions of the Russian Federation's policy on S&T development until 2010 and subsequent period. Letter by the President of the RF from 30.03. 2002# PR-576 (in Russian).
- The Federal Law of the Russian Federation "On Science and the State S&T Policy". (23.08.1996), # 127 (in Russian).
- The List of the Critical Technologies of the Russian Federation. (21.05.2006) # PR-842 (in Russian).
- The Priority Areas of S&T Development for the Russian Federation. (21.05.2006) # PR-843 (in Russian).

- Programme for Modernisation of the Structure, Functions and Funding Mechanisms in the Academic R&D Sector (2005). Inter-Departmental Commission for Science and Innovation Policy. Protocol # 4/04 (in Russian).
- The Budgetary Code of the Russian Federation (31.07.1998) # 145-FZ (in Russian).
- The "Concept of Budgetary Process Restructuring in the Russian Federation for 2004-2006" (22.05.2004) # 249 (in Russian).
- The Federal Law of the Russian Federation "On Autonomous Institutions" (03.11.2006) # 174-FZ (in Russian).

3.2.1 Priority Areas of S&T and Critical Technologies

Nowadays all S&T and innovation policies in Russia are directed according to the national priorities framework. The efforts to select S&T priorities were first launched at federal level in the middle of the 1990s, and have since been continued on a regular basis. National S&T priorities are formulated in two lists – priority S&T areas and critical technologies[12]. The List of Priority S&T areas for the Russian Federation sets the general trends of the country's S&T development and contains the S&T areas regarded to provide new technologies and facilities to contribute to the development of the national economy and society. They are specified in more detail in the List of Critical Technologies of the Russian Federation (see below), a guide for decision-making.

The first list of eight priority areas was approved by the Government Commission on Scientific and Technological Policies in 1996. In 1999 it was submitted to a large-scale examination by more than 1000 leading experts. The analysis revealed an urgent need to reconsider the system of priorities in "breakthrough" directions. In 2000-2001 new lists of nine S&T priority areas and 52 critical technologies were developed. The main changes consisted in a review of the number of priority areas and in concentrating resources on the most important fields of innovation.

In 2002 the Russian President approved Basic directions of the Russian Federation's policy in S&T development. This document has become an important element of Russia's social and economic development strategy, aimed at innovation-based economic development, creating of an efficient national innovation system and making S&T one of Russia's key priorities. The S&T priorities and critical technologies approved within that document resulted in the list of research areas that was still too broad to become real targets for selecting technologies for priority government support and for private investment. That was the reason for Russia's Ministry for Education and Science to organise a review process and update the lists in 2003/2004. The revision of S&T priorities was carried out during a period of sustained economic growth and substantial improvements of the S&T governance system. The updated list of priorities was approved by the Russian President on May 25, 2006 and included 8 priority areas (The Priority Areas of S&T Development for the Russian Federation, 2006) and 34 critical technologies (The List of Critical Technologies of the Russian Federation, 2006 – see Annex 9.2).

[12] Priority S&T areas are deemed to be subject areas of S&T with potential for making a major contribution toward providing the country's security, faster economic growth, greater competitive capacity of Russian companies through development of the technological foundations of the national economy and R&D-intensive production facilities.

Critical technologies are considered as sets of technological solutions that create potential for further development of various technological areas, possess a broad range of innovative applications in various sectors of economy and as a whole make the greatest contribution to the resolving of the major problems of implementing scientific and technological priorities.

Priority Areas of S&T Development of the Russian Federation

- Security and antiterrorism
- Life Sciences
- Industry of nanosystems and materials
- Information and telecommunication systems
- Advanced weapons, military and special technologies
- Sustainable use of environment
- Transport, aviation and space systems
- Energy and energy saving

These priority fields are highly important as basis for R&D funding allocation, and consequently most funds are directed towards these priorities. In 2007 RUB 164.3 billion (€ 4.69 billion) or 44% of GERD were spent on R&D in these priority areas (excluding priority advanced weapons, military and special technologies). About one half of these funds were allocated for transport, especially on aviation and the space programme.[13] From a socio-economic point of view, defence-related expenditure is very important in Russia, and accounts for half of governmental R&D expenditure.

While the most essential market reforms in Russia were implemented in the 1990s, in the R&D sphere this process remains unfinished by now. According to official figures, in 2009 only 2.8% of all Russian organisations and enterprises were in state ownership,[14] but for the R&D sector this value exceeded 70%[15]. A share of the remaining 30% of private sector S&T organizations were are also partly publicly owned.

3.2.2 Socio-Economic Strategy and R&D funding

With the main framework documents before 2008 (see list above) some attempts were undertaken to modernise the S&T system, but these efforts were still incoherent and lacked instructions for implementation. Later positions of these documents were consolidated and widened in the main official initiative for the Russian economy for the mid-term perspective – **"Concept of a Long-Term Socio-Economic Development of the Russian Federation until 2020" (CLTD, 2008)**. This document reflects an increased importance of mid-term socio-economic and S&T development priorities, influenced both by global trends and limitations as well as national specifics and potential.

All economic actors feel an urgent need for a coherent governance approach towards the country's R&D and innovation system. The pressure of legal, administrative, financial and other limitations and barriers affects the operational efficiency of government policies and hampers the transition of the economy to innovation-driven growth. A major result of the implementation of the Concept (including the long-term forecast of socio-economic and S&T development prepared in the course of this work) is the consensus between society and economic community regarding an unquestionable need to shift the national economy from heavy reliance on raw materials exports to innovation-driven, socially oriented development. In effect, for the first time in Russia, the Concept uses a modern definition of an NSI including its basic elements: (1) interlinked structures engaged in production and/or commercial exploitation of knowledge and technologies, and (2) a set of legal, financial and social institutes enabling interaction of educational, R&D, entrepreneurial and non-profit organisations in all spheres of the national economy and society.

[13] University - Higher School of Economics (HSE): Science Indicators, 2009, Moscow.

[14] This indicator has even declined, as it amounted in 2007 to 3.3%. But these figures should be considered cautiously, as public ownership has still a strong role in the Russian economy.

[15] Statistical Yearbook, 2009 // www.gks.ru

The Concept is based on three main elements:

- **The policy framework** – the Concept brings together the key policy directions and establishes connections between NSI development policies and related spheres – education system, high-tech, environment protection strategies, health system, regional development etc.;
- **The "roadmap" for reforms** – this component of the Concept sets out the structure of each reform direction as well as a basic plan of actions. For NSI it is represented by six initiatives including:
  - development of human resources for innovation,
  - creation of a highly-competitive institutional environment, stimulating entrepreneurial activity and investments;
  - structural diversification of the economy on the basis of innovation-driven technological development;
  - securing and advancing Russia's global competitive advantages in traditional areas (energy, transport, rural sector, processing of natural resources);
  - expanding and safeguarding foreign trade relations, raising efficiency of Russia's participation in international division of labour;
  - a shift towards a new model for territorial development of Russia's economy.

  The Concept confirms herewith a transition to an innovation-driven growth model and outlines restrictions, opportunities and directions of such a transition in detail.
- **The target indicators** – a statistical tool for tracking the main macro-effects to monitor the progress of the reforms. There are several indicators proposed referring to the NSI development goals, such as GERD-to-GDP ratio, labour productivity, and other indicators for the high-tech industries. Relevant indicators for the innovation system are presented in Table 2 below:

Table 2. The key CLTD target indicators for the NSI development

	2007	2020
GERD to GDP ratio, %	1.12	2.7
Labour productivity growth rates, %	6–7	9–10
Share of high-tech sectors in value added, %	10.9	17–19
Share of high-tech products exports in the world's total, %	0.3	2.0
Share of innovative products in total sales, %	5.5	25–35
Share of industrial enterprises engaged in technological innovation, %	13.3	40–50
VA of innovation sector to GDP, %	10–11	17–20

Source: *CLTD, 2008*

The other currently relevant strategic document is the **Strategy for Development of Russia's Science and Innovation till 2015**[16]**,** adopted by the Ministry of Education and Science in February 2006. It was developed to target the problem of the low level of commercialisation of Russian S&T sector output. The reasons for this situation are a mismatch between the S&T areas of activity and private sector priorities, as well as a generally low demand of the private sector for innovations. The document aimes at ensuring technological modernisation of the economy and its higher competitiveness based on most advanced technology and transformation of S&T capacities as one of the key resources for a sustainable economic growth. The Strategy is based on two main principles, which are a focusing of the federal R&D budget and development of public-private R&D partnerships.

The document lists main tasks, terms and timeframe, financial plan and monitoring tools. The four key tasks include creation of a competitive R&D sector, creation of an effective NIS, development of institutions for use and legal protection of R&D results and modernization of the economy based on technological innovations. The financial plan shows a priority of federal funding, with rather extensive reliance on non-budgetary funds and modest input from regional budgets.

The Strategy also sets some key indicators to verify attainment of results, such as increasing of university-performed R&D. Among the target indicators are an increase of GERD to 2% of GDP in 2010 and to 2.5% of GDP in 2015, whereby the share of non-budgetary investments in R&D should gradually increase to 70% of GERD by 2015. Other indicators include attraction of young researchers (which shall reach 36% of researchers under 39 by 2016), increased patent activity, increased number of small innovative enterprises (assuring annual growth rate of 120 units by 2016), greater innovation activity of enterprises (share of enterprises undertaking technological innovations should reach 20% by 2016, which will also lead to greater share of innovative products in total sales and experts of industrial products). By 2010 it became obvious that certain indicators, like the share of innovative products, will not be met.

3.2.3 Institutional structure of the R&D sector and funding

Domination of government-owned institutions in the S&T sector, which are funded from the federal budget, remains one of the most pressing problems, which the Russian science and technology sector is facing. Various types of commercial and non-profit organisations were established during the transition period of the Russian economy, but there was a minimal change at the level of the state R&D organisations. Over 70% of all R&D organisations in Russia are publicly-owned and 37% belong to the state sector[17].

Russia has a huge system of **state Academies of Science**, a legacy of the former USSR. The most unusual feature of their legal status is its "mixed" nature, combining elements of government institution, public association and some other forms (e.g. corporation or alliance). Another specific feature is the fact that academies act as holdings, "owning" non-profit organisations and special R&D units The creation of an institution (academy) consisting of many other institutions (research institutes) may cause property conflicts and is not allowed by Russian civil laws. However, under the Federal Law "On Science and the State S&T Policy", state academies are an exception, organised exactly in this way. Finally, an important

[16] Adopted by the Interdepartemental commission for science and innovation policy (Protocol #1 from 15 February 2006).

[17] HSE, Science Indicators: 2009. Statistical Databook, Moscow, 2009.. Though many R&D institutions de-facto belong to the state-sector, they are being formally calculated by statistical services to the business sector.

feature of state academies' status is that they operate as government institutions. Academies receive and manage government funding provided by the state. They can manage and control institutions, create and close them. This "mix" of various organisational, legal and administrative forms has no precedent in other countries. An issue of concern is the mismatch between results of the R&D carried out by the academies and the amount of their public funding.[18] There are other issues as well: inefficient monitoring of the federal property use and financial resources (including public funds) allocation, along with insufficient transparency in this process. In general at least 26% of all public funds allocated for civil S&T are directed to state academies.[19]

In 2005 the **"Programme for modernisation of the structure, functions and funding mechanisms in the academic R&D sector" (2005)** was adopted. The aim was to streamline the network of academic organisations and to introduce some new organisational forms for R&D. It was supposed to be implemented by 2008, but actually it did not happen. The resistance of the academy's top management was strong enough to preserve academy's autonomy (operational and budgetary), and the plans for more radical changes are still far from realisation.

The large number (and proportion) of government-owned R&D institutions makes Russia very different from other developed economies. State R&D institutions funded by the government have to adhere to legally-binding limitations of a "budget institution". They had previously almost none of the rights (and responsibilities) for adequate economic operation. A recently adopted set of laws shall facilitate a change of this situation[20]. These legislative changes offer more flexible autonomous and independent organisational forms for a more effective performance of the entire government S&T sector, as well as for institutions from other sectors (education, culture, health care etc.). More than a year after the adoption of the federal law #217 on the creation of small innovative enterprises by universities and research organisations, it became obvious that there is a need for the adoption of amendments and by-laws. Very few universities actually created small enterprises for commercializing their R&D. Reasons for that are very limited of intangible assets (patents, licenses), underdeveloped innovation infrastructure and qualified specialists, unwillingness of private sector to engage in long-term risky innovation projects, as well as special rules for insolvency of small innovative enterprises[21].

A new flexible model known as 'autonomous institution' was adopted by the federal law **"On Autonomous Institutions" (2006)**. In contrast to the existing budgetary-funded institutions, the new structures in the social sphere will not fully rely on fixed funding from the federal budget; they will be allowed to receive funding from a variety of sources. This shall increase the quality of output. At the same time they will remain government-owned entities. Autonomous institutions will have certain autonomy and independence in attracting and spending funds from non-governmental sources, including credits and investments. It will give them new development opportunities, not available for 'traditional' budgetary-funded institutions.

[18] See for example: Schiermeier, Quirin (2010). Russia to boost university science, Nature 464/29, 1257.
[19] HSE, Science Indicators: 2009. Statistical Databook. Moscow, 2009.
[20] The Federal Law "On autonomous institutions" from 3 November 2006, 174-FZ; the Federal Law "On introduction of changes to selected legislative acts of the RF for allowing the creation of commercial enterprises by educational and research institutions for commercialization of their intellectual activity results" from 2 August 2009 #217-FZ.
[21] http://www.strf.ru/organization.aspx?CatalogId=221&d_no=25423

The prospects for transition of the government-owned R&D organisations into the new form are outlined in **"R&D and Innovation Development Strategy in the Russian Federation until 2015" (2006)**. At least 250 R&D institutions and Higher Education Institutions (HEI) should move to the new status over a fairly short period of time. Taking into account the period planned for this institutional transformation, the task looks quite complicated. Large national R&D centres are also expected to operate this way, but the track record for R&D institutions is rather modest to date.

3.2.4 The federal budget and R&D funding

The transition strategy also requires a budgetary reform. Most of the industrially developed countries are trying to find more efficient mechanisms and forms of government support for R&D. The complexity of the problem is explained by the obvious need for such support and by strictly limited resources. The solution found by the Russian Government is based on more efficient allocation of budgetary resources coupled with institutional reforms in the R&D and innovation sphere.
The Russian federal budget for civil S&T is today almost equally distributed between direct and competitive funding. The main part of competitive funding (about 40%) goes to the Federal Targeted Programmes (FTP): RUB 831727.0232 million were directed to 52 FTP in 2009[22]. Almost half of the civil S&T budget is still allocated to governmental R&D institutions under academies of science, Government, federal ministries and their subordinate agencies. This funding stream is still not based on S&T priorities or on R&D performance.

The appropriate budgetary legislation was developed in Russia throughout the whole reform period. The **Budgetary Code of the Russian Federation (1998)** put in place a framework for regulation of budgetary relationships. However, the restructuring of the budgeting process did not start for six years. Only in 2004 the **"Concept of Budgetary Process Restructuring" (2004)** was approved. It was based on four key principles:

- Separation of existing and newly approved expenditures;
- limiting approved expenditures to objectives clearly defined in advance, according to government policy priorities;
- targeting and programming planning techniques application;
- developing a system of real and target indicators to evaluate performance of government agencies.

Since that time Russia has entered into a new stage of public funds management – **mid-term performance budgeting**. All its principles were applied in the 2006 budget, when a prospective three-year financial plan was approved, which foresaw annual budget reviews.
Under the new classification[23], R&D expenditure is divided into basic and applied parts, which in turn are split into sections. Basic research expenditure comes under the "general issues" section. Applied research expenditure is mostly accounted under all other sections of expenditure functional classification – in order to support R&D for education, economy, defence etc. One of the most important elements of the budgeting process development was correction of budget classification and accounting. Under the "Concept of Budgetary Process Restructuring", the new classification was brought in line with the main functions of

[22] http://fcp.vpk.ru/
[23] For details see Federal Law on Budget Classification of the RF, adopted in1996, ed. Federal laws #115-FZ from 05.08.2000, #127-FZ from 08.08.2001, #51-FZ from 07.05.2002, #53-FZ from 06.05.2003, #45-FZ from 26.05.2004, #58-FZ from 29.06.2004, #174-FZ from 23.12.2004, #176-FZ from 22.12.2005. http://nalog.consultant.ru/online/?req=doc;base=NBU;n=57350

government agencies and with international standards for accounting and public finance statistics.

3.2.5 Foresight and R&D funding

As long as the state remains the largest R&D "sponsor" and will do so in the future, the Russian government is planning to continue reforms in three directions: (1) more concentration on the national priorities; (2) optimisation of the funding structure; and (3) new principles of the budgetary funding. Concentration on the national priorities requires that direct government support of applied research and technologies should be well focused, supporting those, which are the most relevant to the national priorities only. Foresight is considered to be the most useful tool for national priorities setting. The first project for practical implementation of foresight technology in Russia was launched in 2006-2008.
In December 2008 the Russian Academy of Sciences (RAS) presented the **S&T Forecast of Russian Development Strategy till 2030**. This document was developed in accordance with the President's order to the Government of the RF and the RAS on 4 May 2008. Government of the RF undertook the first phase of research in cooperation with the Ministry for Education and Science, Ministry of Economic Development, Ministry of Industry and Trade and Ministry of Finance, which was then taken over by RAS. Previously, the Institute of World Economy and International Relations of RAS made a study of external innovation environment – a cross-country comparison of around 70 national S&T forecasting and foresight exercises.

3.2.6 Other reform trends for S&T funding

Optimisation of the funding structure is an important measure, especially in a situation, when GERD is growing. An ongoing change in the structure of the government expenditures is expected. Funding should be re-allocated in favour of targeted programmes and state R&D foundations. However, a further reallocation is hampered by an only slowly advancing reform process of the R&D sector. A crucial principle of the forthcoming restructuring of R&D funding is a transition from subsidies towards credits, while moving along the innovation "chain" (basic research – applied research – development – implementation of innovations – consumption of innovation products).

New principles for the budgetary funding can be defined as **competition-based funding** (i.e. not estimation-based). The share of so-called "basic funding" in the R&D budget (funds allocated to particular organisations for specific purposes regardless of their performance) will be gradually decreased. However, each government-owned R&D organisation having survived after the restructuring of the government R&D sector should receive enough public funding to meet its actual needs. So-called package funding[24] practice known in many countries is also being considered in Russia. It would provide a certain freedom of financial management and increase the operational flexibility of R&D institutions.
Already in 1990-ies RFBR, FASIE and some other bodies were established, which marked the shift from traditional block-based funding to competitive allocation of S&T funding. In early 2002 Russian President V. Putin called competitive S&T funding the most efficient funding at the meeting with scientists and the National Security Council. He proclaimed his support to scientific foundations; and earlier he called on RAS to pass from block funding to more efficient competitive funding[25].

[24] Funding allocated not for single project, but for a series of complementary projects.
[25] Nezavisimaya gazeta # 266 (2820), 11 December 2002.

The Federal Targeted Programme "R&D in Priority Fields of Russia's S&T Complex in 2007-2012" was initially based on demands of S&T organizations. In the first years of its implementation (2002-2004) the programme's resources were limited, and this approach suited the purpose of conservation of existing potential, but did not target at its development. In 2004 the Programme's management was reorganised. The reorganisation included division of spheres of responsibility and decision-making spheres. The Ministry of Education and Science is key programme owner: it sets the rules: the programmes' terms of reference (TOR), TOR for managing bodies, expertise and reporting procedures. The programme was previously managed by Rosnauka, an agency formerly subordinated to the Ministry, it gathered applications on Programme's thematic directions and made initial expertise of applications. The managing body – Scientific Coordination Council – was created, composed of leading Russian scientists, rectors of educational institutions, representatives of business, key programme owner and programme owners. The Council is headed by the Minister and takes decisions on priority issues to be funded, timeline and amounts.

The competitive S&T funding has evolved over time and this process is still ongoing. Since 2009, the Russian Academy of Sciences passed on to new funding principles in line with the Fundamental Scientific Research Programme for the Academies of Science for 2008-2012[26]. One of the planned outcomes is to increase the share of competitive R&D funding from 15% to 25% by the end of 2012.

Streamlining the mechanisms of joint innovation programmes and project funding is an important element of the budgeting process. Improvement in this sphere requires creation and development of legal instruments regulating cooperative agreements in R&D sector and NSI, grant support and long-term government orders for R&D, technologies and innovation. These forms are used to establish public and private sector partnerships and apply the R&D potential efficiently in all developed countries. Using such tools and mechanisms, developing standards and frameworks for independent expert evaluation would improve the whole system of government funding in general, promote a practical shift towards projects and programme funding, increase financial transparency and streamline procedures for making and spending profits, as well as sharing the risks of R&D and innovation activity.

[26] Approved by the Decree of the Government of the RF from 27 February 2008 #233-p.

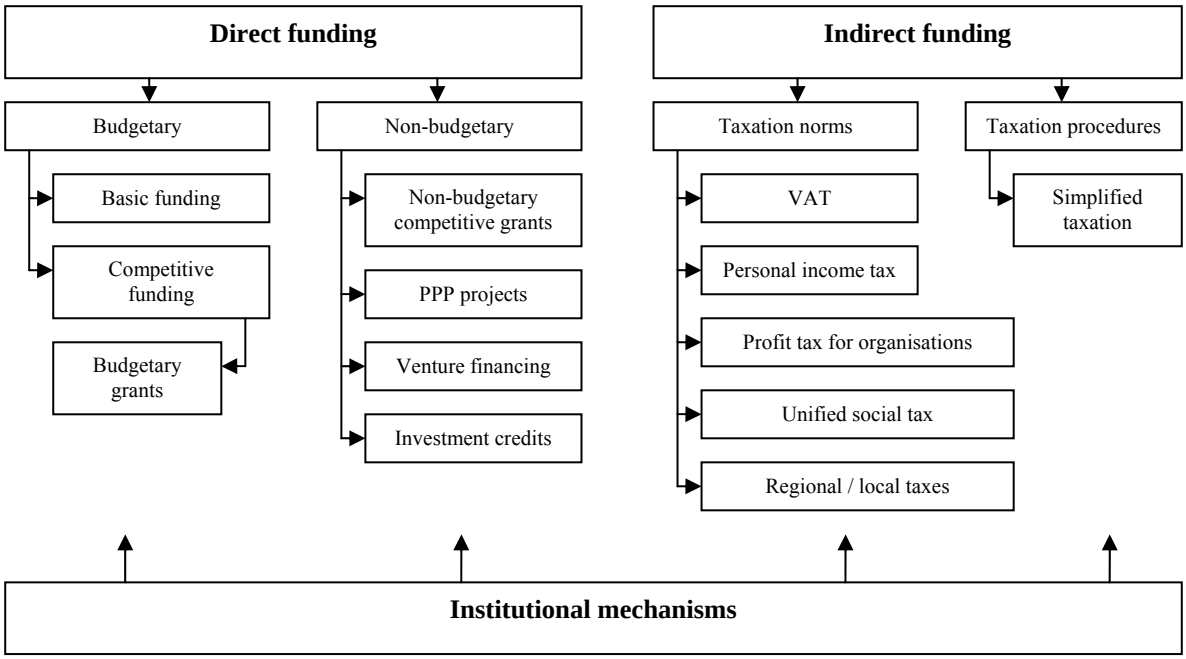
4 Typology of funding instruments for S&T and innovation

The challenges of a transition towards a knowledge-based economy require radical shifts in the Russian economic system including increased investments in education and science, in technological and organisational innovations, a faster development of high-tech industries accompanied by an overall increase of the technological level of traditional industries, and the emergence of new industries. These shifts need to take place in the frame of the Russian system of innovation, which is characterised by its own specifics such as uncertain and delayed results, a mismatch between overall social and specific individual effects, between information available to researchers, innovators, potential investors and consumers, high investment risks, and particular requirements regarding workforce skills and management quality.
These findings correspond with an evident increase of the role of an innovative "component" in the public administration. Recent Russian Government policy strategy papers dealing with shifting the economy to an innovation-based model clearly demonstrate that the government has a firm agenda. At the same time the exact motivation of the innovation development scenario, certain target indicators, the set of policy priorities (as well as specific implementation measures) with minimum social costs, may be questioned.

Funding mechanisms are basic and the most evident means for current regulation and strategic policy-making in this context. The direct funding for S&T and innovation in Russia is represented by the budgetary financing mechanisms (including basic and competitive forms) and non-budgetary sources.[27] The second support layer for S&T and innovation is indirect funding via special taxation norms and procedures. And the third key element includes particular mechanisms incorporated into the institutional framework to improve efficiency, accuracy and transparency of financial transactions in the S&T and innovation sphere.

[27] Under "budgetary funding" we understand here funding of S&T and innovation from the Russian federal budget, as opposed to "non-budgetary funding", which includes funding from regional sources, business, Higher Education Institutions (HEI), private non-profit organisations and from abroad.

Figure 3. Typology of S&T and innovation funding instruments in Russia



4.1 Budgetary funding

Funding of S&T and innovation from the federal budget is the first pillar of direct funding mechanisms. The federal budget is the main funding source for Russian R&D with a share of nearly 65% of GERD (2008).[28] By law public budgetary funds can only be used to finance services provided in the interest of the whole society, or to support public structures and organisations created for the same purpose. There exist two forms of budgetary funding for S&T and innovation: basic (or block) funding and competitive funding.

4.1.1 Basic funding

Basic funding is allocated mainly **from the federal budget directly to major Russian R&D institutions,** by the **ministries dealing with S&T and innovation or by federal executive authorities for R&D (e.g. Federal Space Agency – Roscosmos).** Basic funding is provided to public R&D organisations based on a number of indicators, which are not related to the performance of the organisations. These non-performance-based indicators concern for example the number of staff and the level of expenditure in the previous year.

When it comes to receivers of basic funding, the Russian Academy of Sciences needs to be mentioned in first place. It absorbs approximately a third of the Russian civilian R&D budget, whereby it receives most of this funding in the form of basic funding. Other major beneficiaries of basic funding through the federal budget are state corporations and companies, like the State Corporation for Atomic Energy (Rosatom). Certain R&D units, which receive basic funding (e.g. the national research centre Kurchatov Institute), have to satisfy in addition to non-performance-based indicators a number of other requirements, such as an approved S&T development programme. Some major Russian universities are directly subordinated to the government and receive also basic funding directly from the federal

[28] Science. Innovations. Information Society. Brief Statistical Data Book. Moscow. HSE. 2009.

budget.[29] Other universities receive basic funding from the Ministry of Education and Science. A range of branch R&D institutes, which are subordinated to certain ministries, receive basic funding from their responsible ministry.

4.1.2 Competitive funding

Competitive funding is allocated through foundations and through programme funding. Grant and tender procedures are used for implementing competitive funding. Usually the programme mechanism is used to finance projects aimed at solving specific S&T problems (e.g. in space industry, nuclear physics, aircraft construction etc.) or for supporting structural priorities (e.g. strengthening R&D in the university sector). The Federal Targeted Programmes (FTP) or competitive programmes of ministries (e.g. National Research University Programme) are typical examples of this mechanism. Federal Targeted Programmes have been designed to fund R&D in certain thematic and socio-economic priority fields. They are usually supervised by thematic units (nano-, etc.) of different departments of a federal ministry or subordinated federal agencies. In the year 2009, through the federal budget, support was provided to 52 FTPs, which consisted of a number of sub-programmes; although it should be noted that several FTPs have no or only limited relevance for R&D and innovation funding. Over the years the number of FTPs has been growing, which confirms the increasing importance of this mechanism. For example, in 2005 funding was provided through 33 FTPs.[30]

The share of competitive funding in the total budgetary funding of civil science and technology constitutes 45%, of which 36.5% are foreseen under FTPs and competitive programmes of ministries, and 8.5% are foreseen for state science foundations. Due to crisis-related considerable budgetary cuts of certain S&T FTPs in 2009 and 2010 (e.g. "R&D in Priority Fields" and "Development of nanoindustry infrastructure"), it was decided to prolong these FTPs for one year.

The grant funding in Russia is partly also tender-based. Grants are provided to support the best projects and the most performing research teams. Grants are allocated through the system of **public foundations,** which are entitled to receive a certain percentage (specified by law) of the total budget appropriations for civil research and development:

- the Russian Foundation for Basic Research (RBRF) receives 6% of the civil R&D budget,
- the Russian Foundation for Humanities (RFH) receives 1% of the civil R&D budget,
- and the Russian Foundation for Assistance to Small Innovative Enterprises (FASIE) receives 1.5% of the civil R&D budget.

Grant programmes and tender competitions are being implemented also through various **ministries** and are mostly competition based. Examples for such programmes are the "Support to innovative educational programmes of universities"[31] or the more recent "National Research University Programme"[32].

[29] Universities directly subordinated to the Russian government are Moscow State University, St. Petersburg State University, State University – Higher School of Economics (HSE) and two Federal Universities.

[30] http://fcp.vpk.ru/cgi-bin/cis/fcp.cgi/Fcp/Graphics/pub_dynamic_budj_fin_fcp/2010/

[31] For example, the Programme "Support to Innovative Programmes of the Russian Educational Establishments", which is part of the overarching national priority project "Education". The programme was implemented in two competitions in 2006 and 2007. Participants of the competition were Russian higher education institutions, which presented their innovative educational programmes to be implemented over a period of 2 years. Higher education institutions, which won the competition, obtained state support from the federal budget from RUB 200 to 1000 million. The volume of funding from the federal budget amounted to RUB 5 billion in 2006, RUB 15 billion in 2007 and RUB 20 billion in 2008. As of the first quarter of 2009, 57 innovative educational

4.2 Non-budgetary funding

Non-budgetary funding includes support for S&T and innovation activities provided by public sources other than the federal budget, and by private and international sources according to the law "On science and state S&T policy".

4.2.1 Non-budgetary foundations

One of the first of non-budgetary foundations, established already in 1992, is the **Russian Foundation for Technological Development (RFTD).**[33] It is subordinated to the Russian Ministry of Education and Science and has the status of a federal state institution. RFTD is financed through quarterly contributions of up to 25% of non-budgetary receipts of government ministries, departments and associations. Commercial entities, i.e. enterprises, may contribute to RFTD; if they do so, 1.5% of their income can then be tax exempt.[34] RFTD provides with these resources support for R&D activities and development of new research-intensive products in the form of loans. In the last years, the Foundation has developed only limited activities and plays currently a minor role in the Russian R&D funding system.

4.2.2 Public-Private Partnership (PPP)

Public-private partnership projects to support R&D activities are used in efforts to stimulate innovation activities and to attract private money for R&D, which is still rather limited in Russia. PPPs for R&D were first tried by the Russian government in 2002. The priority was then given to support of major innovative projects of national importance (so-called **mega-projects**). These large-scale innovative projects were implemented by teams comprising representatives of R&D and industrial organisations. According to "Main areas of the Russian Government Investment Policy in S&T Sphere", major innovative projects are based on world-level R&D results obtained through conducting research in priority areas, which allow setting up large-scale high-technology production of research-intensive competitive products, financed by public and private funds.

The first tender for major innovative projects was announced in May 2002. 12 mega-projects were selected and each received $ 20 million for two years from public and private sources. Public funds were supposed to amount to not more than a half of each project's total budget, with the rest being provided by interested investors. The financial appropriations for the mega-projects were divided equally between the Ministry of Education and Science and the Ministry of Industry and Trade. By the beginning of 2006 two of the mega-projects had completed the pre-investment stage of development and were sent for evaluation to the Ministry of Economic Development and Trade. Total government funding allocated to the mega-projects by then amounted to RUB 2.56 billion, plus more than RUB 2.77 billion of

programmes of Russian universities, selected in the two competitions, were obtaining support from the federal budget. As a result of programme implementation, in 2006 over 300 laboratories were modernised in all 17 higher educational institutions, which were winners in the first round of the competition, and around 2000 lecturers passed additional qualification programs and internships, unique equipment was purchased. See for further information: http://mon.gov.ru/pro/pnpo/vuz/

[32] See for details: http://mon.gov.ru/pro/niu/

[33] RFTD was established in line with the Order of the President of the RF from 27 April 1992 #426 "On urgent measures for preservation of S&T potential of the RF".

[34] See www.rftr.ru

private money. Potential sales of innovative products generated through these projects were in 2006 estimated at the level of RUB 5 billion.[35]
Currently, the major strategy in advancing PPP is to request private **co-funding of projects**, financed under S&T and innovation Federal Targeted Programmes. The main Russian competitive R&D funding programme, the Federal Targeted Programme "R&D in Priority Fields of the S&T Complex of Russia" (2007-2012) foresees, for example, that its budget shall be financed by around 70% out of the federal budget and the remaining part by other sources. Other Federal Targeted Programmes also foresee similar co-funding schemes.

In the same way, the Foundation for Assistance to Small Innovative Enterprises (FASIE), applies co-funding requirements from small enterprises in collaborative projects supported under its different action lines.

Another PPP strategy is linked with development of **Special Economic Zones (SEZ)**. There are 3 types of SEZ in Russia: industrial, R&D and touristic-recreational zones. SEZ are regulated by the Federal Law of 22 July 2005 #116 "On Special Economic Zones in Russia", which seized the existence of most of previously created SEZ and free economic zones (with the exception of Magadan and Kaliningrad). Upon the results of the 2005 competition, out of 71 applications the commission chose 6 projects, which mostly reflected the SEZ goals. It was then decided to create 2 industrial SEZ (Tatarstan Republic and Lipetsk city) and 4 R&D SEZ (Moscow (Zelenograd), St.Petersburg, Dubna and Tomsk). These zones have been established around important public scientific centres, and are located in St. Petersburg, Tomsk, Zelenograd and Dubna (the latter two situated both in the surroundings of Moscow). Private companies are attracted to these zones with tax incentives. At present there are 17 SEZ across Russia[36].

4.2.3 Venture funding

Venture funding in Russia is represented by more than 40 venture funds investing into innovative projects and setting up of production. .
The Venture Innovation Fund (VIF) established in 2000 with government participation didn't manage to expand due to financial and legal barriers as well as lack of motivation for risky investments. By the end of 2006 a new "fund of funds" was created - the **Russian Venture Company (RVC)**.[37] Its goal is investments in and financial support to the high-tech sector of the economy. The company was registered as a 100% state-owned corporation, and its founding capital was provided out of the federal budget. Another important venture support institution is Russian Venture Fair - an annual event where dozens of companies selected from a large number of candidates demonstrate their projects to investors and consulting firms.
It is important to note that since 2005 the Russian Ministry for Economic Development has held competitions for the creation of **regional venture funds** and closed unit funds with participation of regional authorities.
An important new player in venture funding is the **Russian Corporation for Nanotechnologies (Rusnano)**.[38] It was established in 2007 and has the role of an investment fund, which invests in close to the market technology development and into commercialisation of nanotechnologies. Similarly to RVC it received a substantial founding capital of the federal budget.

[35] See http://www.bilingo.ru/portfolio/presentations/all/51/
[36] http://www.rosez.ru/analitika.html
[37] See www.rusventure.ru
[38] See www.rusnano.com

4.2.4 Investment credits

Investment credits may be regarded as another form of venture investments. However, in Russia they are implemented in a somewhat different form than in other countries. The international practice of providing investment credits (debt financing) is based on mid-term loans (3–7 years) with LIBOR interest rates (2–4%). The rate may be adjusted depending on the circumstances. Russian banks see these terms and conditions rather like long-term ones. Standard terms for providing investment credits in Russia are shorter, for 1–5 years.

4.3 Taxation norms

Taxation norms are the main indirect funding instrument for S&T and innovation activities. In Russia, after a relatively favourable period approval of Part 2 of the RF Tax Code has significantly increased the tax burden for R&D organisations. Specifically, reversal of the RF law "On **value-added tax**"[39] in 2001 eliminated VAT breaks for imported machinery and equipment intended for R&D, for patent and licensing operations involving industrial property, etc. Negative effects of these developments on R&D activities, including cooperation with foreign partners (and international organisations, foundations etc.) became immediately apparent at the time of its introduction.
The latest legislative changes imply that if a foreign founder's invested fixed assets into the statutory capital of a Russian company, its subsidiary company does not pay import customs duties and customs VAT, even if the assets will be passed on to third parties (applies to non-excisable goods related to fixed capital stock). The VAT tax exemption is only related to equipment, listed in the Government's decree from 30.04.09 # 372 (part 7, article 150 of the Tax Code of the RF). The equipment contains items, which have no analogues produced in the Russian Federation[40].

The **profit tax** could provide an interesting incentive for R&D and innovation activities. However, the current state of laws on taxation of organisations is unsatisfactory in this respect. To improve the situation, it could be considered to introduce preferential taxation of profits realised through innovation activities (for organisations), crediting start-up innovation companies (for banks), and insuring entrepreneurial risks of companies engaged in innovation activities (for insurance companies).

The **unified social tax** in Russia is paid by legal entities (employers) that make payments to individuals. Standard tax rate is 26%. Various special rates are used to tax agricultural producers, organisations engaged in popular arts and crafts, small native communities in the Far North who live off traditional industries, individual entrepreneurs and advocates. To encourage R&D and innovation activities, it may be useful to apply a special reduced rate of unified social tax paid by R&D organisations.

Regional and local taxes can provide more opportunities to encourage R&D and innovation activities. However, the complexity of the Russian regional and local taxation requires considerable efforts and time to be adjusted for this goal.

But several positive developments in taxation policy could be observed in recent years. A whole set of legislation is being discussed in Russia, in particular bills on preferential taxation of R&D and innovation activities. Some of these laws have already been adopted in 2006-

[39] Federal Law from 06.12.1991 # 1992-1 (in the edition from 24.03.2001) "On Value-Added Tax"
[40] http://www.energydialogue.org.ru/?q=node/3269

2007 and became valid in 2008. For instance, from 1 January 2008 tax exemption on funding of R&D projects has been extended from means coming from the Russian federal budget to means coming from non-budgetary resources. This means that now also R&D funding of private companies has been tax-exempt. Specifically, it concerns a reduction of the period for which R&D expenditures (reducing tax base) can be included in the "other costs" category for a certain year, and exemption from VAT of all organisations engaged in R&D, regardless of their sources of funding.
Another tax exemption introduced in 2008 applies to **sales of Intellectual Property Rights** (IPR): taxes are not imposed on sales of exclusive rights on inventions, databases and other IPR objects and of usage rights on Intellectual Property on the basis of licensing agreements.
Obviously, the overall effect of these modifications in legislation will depend on the actual amount of breaks and benefits (taking into account organisations' "sensitivity threshold" to tax reduction), as well as on their integrated approach (producers – consumers of R&D results and new technologies; R&D and educational organisations – their funding sources; innovators – investors into innovation activities, staff training).

Tax exemption is also applied on income tax for companies, which pay **fees to the Russian Foundation for Technological Development (RFTR)**. In this case 1.5% of income can be tax exempt.
Another fiscal measure to stimulate private R&D funding is in preparation; **favourable depreciation conditions** for R&D projects shall be added to measures for private R&D stimulation.

Fiscal policy is used as an incentive for attracting companies to settle close to major science centres. **Special Economic Zones (SEZ)** for Technology Development have been established as a result of a competition in 2005. These zones are located in St. Petersburg, Tomsk, Zelenograd and Dubna (the latter two situated in the surroundings of Moscow). Companies settling in the SEZs are exempt from property and land taxes for a period of 5 years and can apply reduced rates for social taxes. It is an effort to stimulate the development of market ready innovative products, by bringing the major actors in such a process next to each other. SEZ's used to be governed by a special agency, the Federal Agency for the Governance of Special Economic Zones. On 5 October 2009 the President abolished the agency (order # 1107) after a little over 4 years of existence. Its functions were passed on to the Ministry for Economic Development.

4.4 Taxation procedures

Taxation procedures as a second pillar of indirect S&T and innovation funding mechanisms are currently represented only by one procedure – the **simplified taxation for small enterprises**. However, the maximum revenue limit, up to which organisations may use simplified taxation rules, currently do not allow applying the simplified taxation to venture companies set up specifically for innovation activities. In order to make establishing of venture companies and investing in their operations more attractive, they could be allowed to choose which taxation system they prefer to use. And, it could also make sense to amend the law in such a way that R&D expenditures and the costs of patenting of R&D products could be included in the list of expenditures subject to simplified taxation.

4.5 The institutional framework

The institutional framework in Russia provides for different forms of financial support to S&T and innovation activities, which are used with varying efficiency and frequency. Currently the state mostly finances R&D and innovation activities directly, including through Federal Targeted Programmes. Some of these programmes aim also at improvements of the institutional framework. For example the main FTP "R&D in Priority Fields of the Russian S&T Complex for the years 2007-2012" sets the goal of development and application of S&T capabilities, while its objectives include institutional elements such as development of an efficient innovation infrastructure, promotion of small R&D organisations and their integration into the system of S&T cooperation.

To ensure successful development of innovation activities in Russia the existing financial rules and mechanisms should be modified. Lack of incentives to invest in high-risk innovative projects and high interest rates for loans seriously limit the range of available sources of capital for venture funding. New financial stimuli could be considered - such as preferential credits, differentiated tax breaks which would take into account the activity level of investors and project initiators, the specific stage of the innovation cycle, and industry-specific characteristics. The institutional framework for S&T and innovation could be enhanced through elimination of excessive administrative and legal obstacles, allocation of higher share of the R&D budget through the competitive foundations, creation of advanced efficient market institutions and a competitive environment for R&D and innovation projects, and encouraging demand for innovations by various economic players.

Improvements of the institutional framework conditions could also mean allocating a higher share of public resources through the well established foundations for competitive R&D funding and enhancing competition within FTPs. Improvements could also concern modifying the tight timing and procedures of the Russian tendering law, simplification of R&D proposals and grant management, and enhancing monitoring and impact assessment of S&T and innovation funding. Several of these points will also be discussed in the chapter on strengths and weaknesses of the Russian S&T funding system further below.

5 Status of Russian S&T and innovation funding

In absolute comparable figures of GERD, measured in USD in Purchasing Power Parities (PPP), Russia ranks among the top ten countries in the world. In 2008 science spending in Russia was preliminarily estimated at USD 24.5 billion PPP. By volume of funding, Russia was by far surpassed by the USA (USD 368.8 billion PPP), Japan (USD 147.8 billion PPP), China (USD 102.3 billion PPP), Germany (USD 71.9 billion PPP), as well as France (USD 43.2 billion PPP), Korea (USD 41.7 billion PPP) and United Kingdom (USD 38.9 billion PPP). But Russia surpassed in this comparison Canada (USD 23.8 billion PPP).

Russia belongs to the group of countries with a relatively high growth rate (by 100–160% or 2–2.6 times) of S&T expenditure over the time period from 1995 to 2006/2007. Within this group of countries are Taiwan, Ireland, Finland, Mexico, Czech Republic, Korea, Hungary, Austria, and Greece.

Table 3. S&T spending trends – an international comparison (2008)

1. Positive trends		
Increase of GERD	1998-2007 – more than 20 times at constant prices – more than 2 times	
2. Negative trends		
	Russia	**Other countries**
GERD as a per cent of GDP	Russia – 1.03%	Canada – 1.82 %; Japan – 3.44 %; USA –2.68 % ; China – 1.49 %; France – 2.08%.
Government budget appropriations on R&D (PPP)	Russia* – USD 17 billion	Germany – USD 23.3 billion USA- USD 142.4 billion Japan USD 30.7 billion
* Russia – civil R&D. Source: *HSE, Science. Innovations. Information Society. Brief Databook, Moscow, 2009.*		

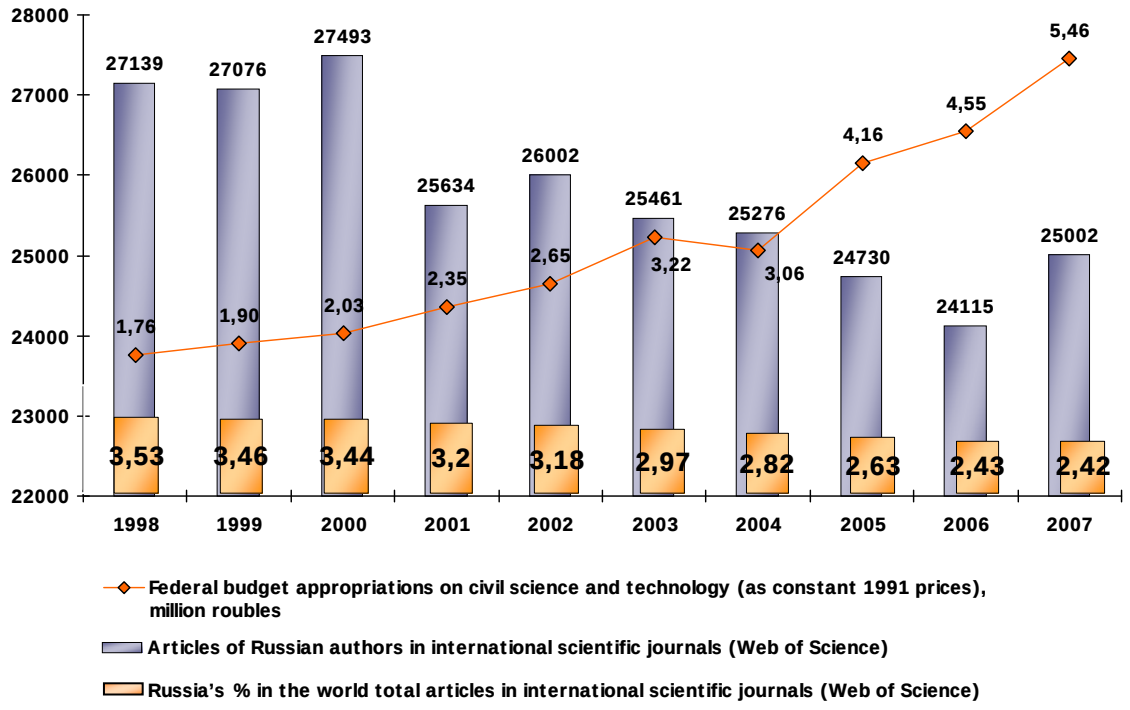
During the years of economic reforms the position of Russia, in terms of comparable scale of science support, changed several times. In 1991 the amount of R&D spending in Russia (in $ equivalent) was higher than in the United Kingdom and was only behind the USA, Japan, Germany and France. But the situation changed and in 1998–2000 Russia did not even make it to top ten leading countries by this indicator, occupying 11th place (in the year 2000 – 12th place). After the year 2000 Russia moved up to 10th place and has in 2007 improved its position further to 9th place in the world ranking. However, all major performance indicators (international publications, international patents, etc.) have been steadily declining in the past few years and, with the exception of absolute numbers of researchers, Russia has not been among the leaders.

Table 4. Gross domestic expenditure on R&D, researchers – an international comparison

Country	GERD, million USD PPP (2008)	Country	Researchers, thousand person/years, in full-time equivalent (2008)
USA	368799.0	USA	1,425,5
Japan	147800.8	China	710,0
China	102331.0	Japan	1423,4
Germany	71860.8	Russia	392,849
France	43232.6	Germany	211,1
Korea	41741.6	France	221,9
UK	38892.8	Korea	175,5
Canada	23781.0	UK	134,3
Russia	24492.8	Canada	451,2
Italy	19678.1	India	115,936

Source: *HSE, Science. Innovations. Information Society. Brief Databook, Moscow, 2009.*

Figure 4. Performance of R&D expenditure



Sources: *HSE, Science Indicators, 2009*; *Science in the Russian Federation, Moscow, 2005.*

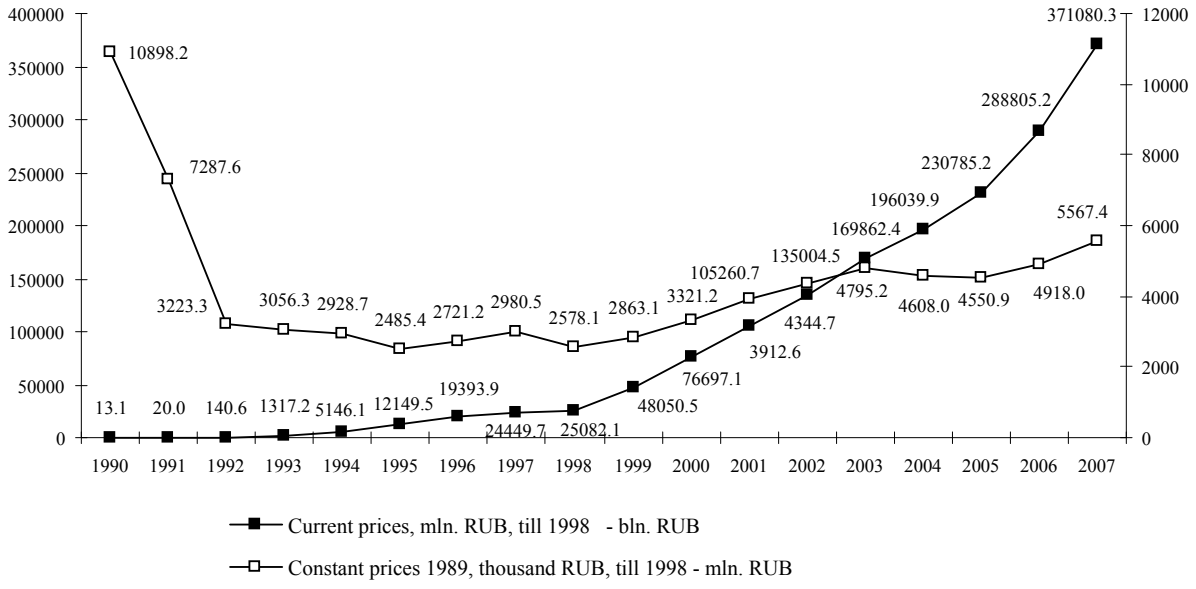
Russia's receipts from technology exports amounted in the year 2007 to $ 630.4 million, as compared to $ 6.1 billion of Austria and the $ 75.4 billion of the USA. Similarly low is Russia's share in the world high tech exports: 0.28%, as compared to World leaders (Hong Kong – 5.44%, Singapore – 4.58% and Korea – 3.85%). Russia's innovation activity in industry reached 9.4% in 2007 against 16.3% in 1992, which places Russia behind most EU Member States (21.2% in Hungary and 69.6% in Denmark).[41]

Despite the considerable growth of patented inventions by foreign applicants, its volume remains limited by international standards – in 2007 their share constituted only 30% of the overall number of applications, submitted in Russia. The ratio of the number of applications from foreign to Russian applicants or dependency ratio (0.4), characterizing the level of internationalization of the created technologies and their markets, is 6.8 times lower that OECD average, which does not correspond to the potential capacities of the Russian technological market and confirms an only slowly declining distrust towards the Russian market.

5.1 Structure of state (budgetary) funding

A considerable growth of S&T expenditure, measured in constant prices, started only in 2006. In 2007, gross domestic expenditure on R&D in current prices amounted to RUB 371.1 billion (€ 10.6 billion). In comparable prices these costs reached 76.4% of the level of 1991, but remained almost twice lower, than in 1990. The structure of expenditure by source of funding and by beneficiary organisation has changed little since the early 1990s. Due to many years of under-financing, absence of modern funding and stimulus mechanisms, Russia did not manage to catch up with the world leaders, neither by volume, nor by comparable expenditure indicators (see figures 1 and 5, and tables 3 and 4).

Figure 5. Gross Domestic Expenditure on R&D (GERD)



Sources: *HSE, Science Indicators, 2009; Science in the Russian Federation, Moscow, 2005.*

[41] Minutes of the Expert meeting on success factors for Russian Participation in the EU RTD Framework Programme. Moscow. 14 May 2009.

One of the key indicators of S&T development is the share of R&D expenditure of GDP. In Russia this indicator grew over the period of 1995–2003 from 0.85% to 1.28%; in 2004 it decreased again from this peak and stays since then slightly above 1% of GDP (in 2008 it reached 1.03%).[42] In line with targets fixed in the S&T and Innovation Strategy of the Russian Federation for the period till 2015[43] this key indicator should have grown much faster – in 2006 to 1.51%, in 2007 to 1.62% of GDP. However, its actual value proved to be considerably lower than the stated targets (table 5); this, in turn, must have influenced other indicators, mentioned in the document. It should be noted though that financial inflows into R&D have in absolute figures substantially increased, which is due to rapid growth of GDP in Russia in the years up to 2008.

Table 5. Gross Domestic Expenditure on R&D as a share of GDP

	2005	2006	2007
Target according to S&T and Innovation Strategy	1.36	1.51	1.62
Actual figures	1.07	1.07	1.12

Sources: *HSE, Science Indicators, 2009; Science in the Russian Federation, Moscow, 2005.*

The sectoral distribution of S&T expenditure in Russia has changed little during the period of 1995-2007. The greatest share of expenditure (64–70%) is, like in other countries, concentrated in the business sector. The share of the government sector in overall expenditure fluctuated in the past years from 24.3 to 29.1% and reached its maximum value in 2007. According to cross-country comparison, this indicator notably differentiates Russia from OECD countries (on average 11.4% in 2006) and EU-27 (13.8%). The share of the Russian government sector in R&D expenditure is twice as high, while the share of the higher education sector is nearly three times lower than the OECD average.

Table 6. GERD by sector of performance in %, 2008

	State	**Business enterprise**	**Higher education**	**Non-profit**
Russia	30.1	62.9	6.7	0.3
China	19.2	72.3	8.5	…
UK	9.2	64.1	24.5	2.1
Canada	9.6	56.1	33.8	0.5
Japan	7.8	77.9	12.6	1.7
USA	10.7	71.9	13.3	4.2

Source: *HSE, Science. Innovations. Information Society. Brief Databook. Moscow, 2009.*

[42] EUROSTAT, S&T Database, 2010.

[43] The Strategy was developed by the Ministry of Education and Science and approved by the decision of the Interdepartmental Commission on Scientific-Innovative policy from 15.02.2006. protocol # 1.

5.1.1 Source of funds for S&T and innovation

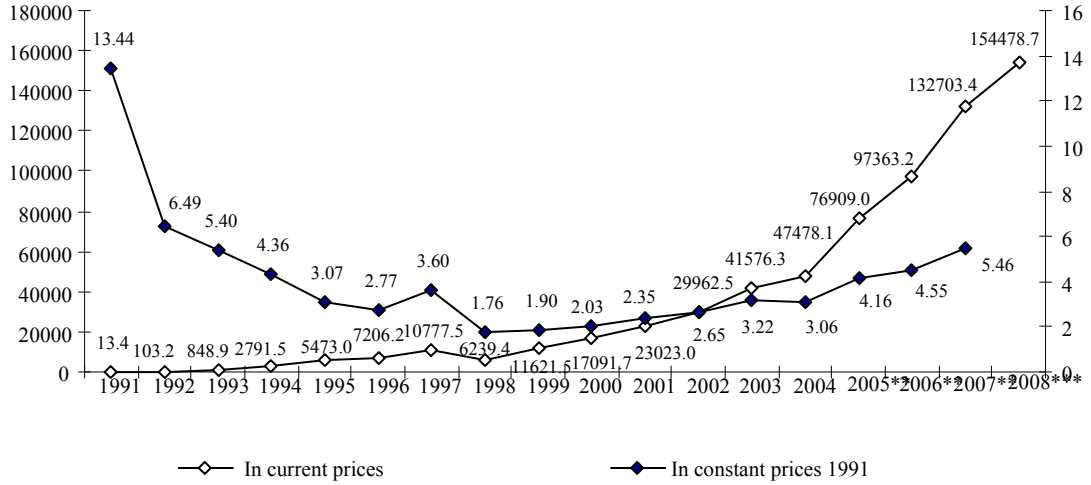
The state budget has traditionally been of key importance as source of Russia's S&T funding. According to the 2007 data the state budget accounted for 62.6% of GERD. At the same time, the system of S&T funding from state budget has been heavily dominated by the federal budget[44]. In the course of the last years preserving (and in some years even increasing) of the budget share of S&T expenditure has been, in a way, a forced measure. It reflects not only the priority of tasks put forward by the state in this area, but also low growth rate of other S&T sources of funding, such as the regional budgets, which did not contribute as foreseen. Also the share of business funding did not increase as expected. In 2007 the share of non-budgetary expenditure in the total volume of gross domestic expenditure constituted 37.4%, which is lower, than foreseen in Russia's S&T and Innovation Strategy up to 2015. The funds, allocated to universities are almost completely dedicated to educational purposes, and are only to a very limited extent used for financing R&D (in 2007 it amounted only to 0.2% of R&D expenditure).
In the course of 1995–2007 state budget funds grew by 2.3 times (in constant prices). In current prices their volume reached RUB 232.4 billion, which is twice as much as the funds of the business sector[45], which grew in 2007 to RUB 109.3 billion (29.4% of the total volume of expenditure). The correlation between the volume of state funds and private investments in S&T, i.e. dominance of state federal funding is a core characteristic of the national S&T system as compared to other states.

The **civil R&D budgetary appropriations** are another key indicator of S&T and innovation funding. Their total volume amounted in Russia in 2008 to RUB 154.5 billion in current prices (Figure 6). A year before, in 2007, this indicator had reached RUB 132.7 billion, which was in constant prices almost 2.5 times lower, than in 1991. Civil R&D federal budget appropriations as a share of GDP similarly changed: from 1991 to 1998 it decreased from 0.96% to 0.24%, and then grew to 0.40% in 2007, reaching the level of 1994.
The consequences of a sharp contraction of budgetary support to S&T during 1991–1996, under conditions of a rapidly growing inflation and an economic setback in 1998 did not allow to reach more ambitious spending targets projected in S&T strategy documents. From these figures is also obvious that a relevant share of around 50% of GERD is spent in Russia on defence related research.

[44] State budget funds include budget appropriations for universities and funds of state sector organisations (including own funds). In 2007 the federal budget covered 97.2% of all budget funds, spent for R&D, while the regional budget share amounted only to 2.8%.
[45] The funds of the business sector include non-budgetary funds and R&D funding by businesses.

Figure 6. Appropriations for civil R&D from the federal budget*

(million Roubles, till 1998 – billion Roubles)



Sources: HSE, Science Indicators, 2009; Science in the Russian Federation, Moscow, 2005.

Federal Targeted Programmes (FTP) remain the key state instrument for supporting S&T and innovation, along with sectoral strategies for industries' development. There are 13 federal targeted programmes in the area of S&T[46] (See table 7).

Table 7. Federal Targeted Programmes in S&T area

Name of the programme	**Overall budget (RUB) - in reference years' prices**	**Of which federal budgetary funding (RUB)**
Programme "Development of Aircraft Engineering in Russia for the years 2002-2010 and till 2015"	23624.7 mln	12231.9 mln
Programme "Global Navigation System"	158188,60 mln	35686,10 mln
Programme "E-Russia (2002-2010)	32 084,8 mln	21 224,55 mln
Federal Space Programme of Russia, 2006-2015	223220,56 mln*	132303,199 mln*
Programme "Development of Russian Spaceports, 2006-2015"	23929,5 mln*	23929,5 mln*

[46] Data from the web-site of Federal Targeted Programmes http://fcp.vpk.ru

Development of Nuclear Energy and Industrial Capacity of Russia, 2007-2010 and till 2015"	1 471,4 bln	674,8 bln
Programme "R&D in priority areas of Russian S&T Development, 2007-2012"	194,89 bln	133,83 bln
Programme "Advancement of Federal Intelligence System and Control over the Airspace of the RF (2007-2010)"	4490,68 mln	4490,68 mln
Programme "National Technological Capabilities", 2007-2011	68754,6 mln*	35684,2 mln*
Programme "Development of Nanoindustry Infrastructure in the Russian Federation", 2008-2010	27733 mln	24944,6 mln
Programme "Development of Electronic Component Base and Radio electronics", 2008-2015	187000 mln	110000 mln
Programme "Scientific and Scientific-Pedagogical Personnel of Innovative Russia", 2009-2013	90,454 bln	80,39 bln
Programme "Development of Civil Maritime Engineering", 2009-2016	136411 mln	90664 mln

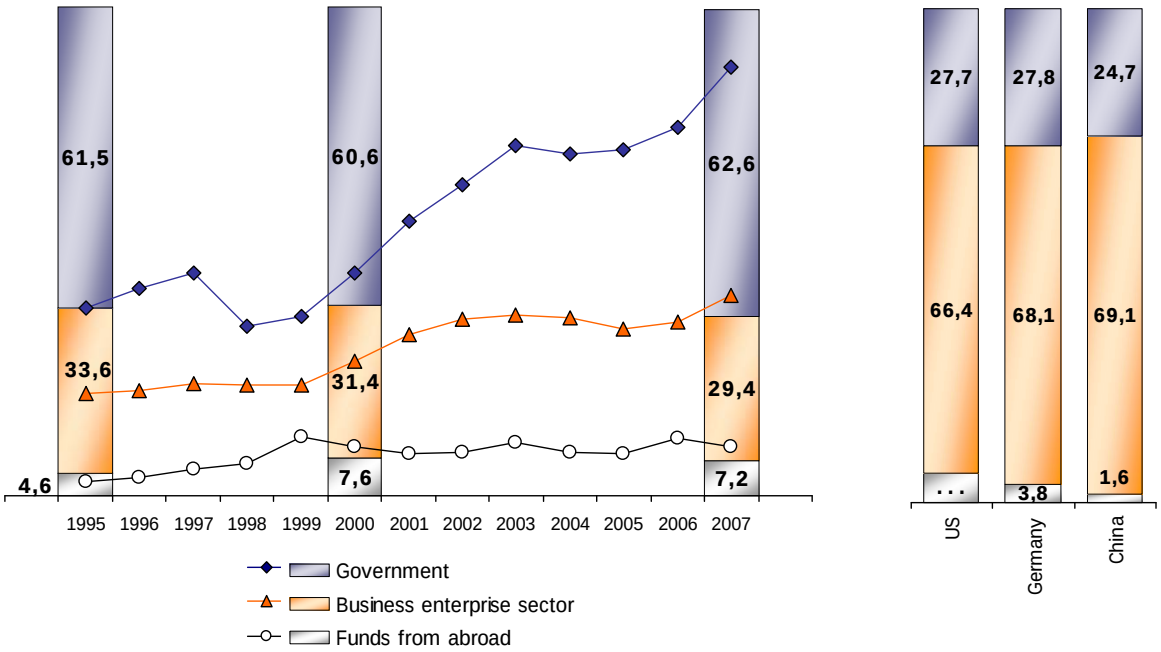
*Calculated until 2010

5.2 Non budgetary funding

Non-budgetary (or non-governmental) funding of R&D includes funding from the business/enterprise sector, from abroad, from the higher education sector, and from other sources (such as private non-profit organisations). In 2007 the share of non-budgetary funds in the total volume of domestic expenditure on R&D amounted to 37.4%, which is lower than foreseen by the S&T and Innovation Strategy. The biggest share of these non-budgetary funding is provided by the business/enterprise sector: in 2007 the business/enterprise sector funded 29.5% of GERD. Funding from abroad covered 7.2% of GERD, while the higher education and private non-profit sectors provided only a marginal share of 0.7% of GERD.[47]

[47] OECD, Major Science and Technology Indicators (MSTI), 2008-2.

Figure 7 Gross Domestic Expenditure on R&D by Source of Funding
(in constant 1989 prices)



Sources: *HSE, Science Indicators, 2009; Science in the Russian Federation, Moscow, 2005.*

5.2.1 Private funding; Business/Enterprise sector

Attraction of private funding for R&D is seen as a priority by Russian S&T decision-makers. Currently nearly all federal targeted programmes foresee non-budgetary funding in their budgets, including from private businesses (see Table 7 Federal targeted programmes in S&T area above.)

In the times of economic stabilization large Russian companies showed a certain interest in innovation activity and development of S&T potential. It should be noted that the most prosperous segment of Russia's economy is companies and enterprises of the fuel and energy complex. Many of these, having completed privatization and consolidation processes, started raising efficiency of internal management structure and have created S&T units.

As a result, in 2002 oil products manufacturing companies became the most innovative companies: the indicator for the oil products industry shows that over 33% of companies in this sector deal with innovative activities, while this indicator on average for all industries reaches only 9.8%. Second in ranking after the oil product's industry comes the chemical industry with 26% innovative enterprises; this branch of the industry is of course closely linked to oil and gas extraction.

In 2007, according to statistical data, purchases of machinery and equipment constituted the biggest share (66.7%) of innovation expenditures of Russian enterprises in processing, extractive industries, production and distribution of electrical energy, gas and water. At the same time purchase of new technology amounted to 12.7% of all innovation expenditures and R&D to 33.5%. Purchase of patents and licenses amounted to as little as 7.3%. In the communications sector, ICT and wholesale trade these figures amounted to 68.5%, 7.9%, 14.3% and 5.8% correspondingly..

It should be noted that the share of purchased outdated foreign equipment, unfortunately, remains quite high. This tendency aggravates the problem of industries' competitiveness. Russia's share in the world trade of civil high-technology products has already for a number

of years not surpassed 0.3-0.5% (as compared with the share of USA - 36 %, Japan - 30 %, Germany - 17 %, and China - 6 %).[48]
To sum the situation up: in difference to most EU countries, R&D and innovation expenditure is in Russia largely dominated by the government, while private investment is still rather low. This trend shows even an increasing tendency: 65% of GERD are provided by the government. But most of R&D is performed in the Business & Enterprise sector. This specificity of the Russian S&T system can be explained by the fact that a substantial range of research institutes are organised as fully or partly state owned companies and that several research intensive companies are publicly owned.

5.2.2 Non-budgetary foundations

The creation of a system of non-budgetary foundations for support to R&D began in 1992, when the Russian Foundation for Technological Development (RFTD) was founded. One of its tasks concerns keeping a registry of non-budgetary foundations. The system of non-budgetary R&D foundations consisted in 2009 of 29 foundations, 16 of which were established by federal executive authorities[49] and the rest – by commercial organisations, some of them formerly state organisations.
Innovative non-budgetary state and private foundations are an important stimulus for innovations, especially given the current budget deficit. These foundations accumulate financial resources of central and regional state authorities, of private and non-for-profit organisations; they have strictly limited aims and tasks: stimulating and funding scientific research, R&D, commercialization, dissemination and application of innovations. Innovative non-budgetary foundations include various autonomous and adjacent non-budgetary funds, special expenditure account and other accounts.
Among active non-budgetary innovative foundations in Russia the following may be mentioned: Federal Fund for Support to Small Enterprises, Russian Foundation for Technological Development, State Conversion Fund, Federal Fund for Industrial Innovations, Federal Fund for Development of Electronic Engineering, federal level non-budgetary R&D funds of sectoral and cross-sectoral nature.

5.2.3 Funding from abroad

Funding from abroad as a share of GERD shows a decreasing trend, since it peaked in 1999 with 16.9% of GERD.[50] While in previous years foreign R&D and charity funds have provided substantial resources for Russian R&D, this engagement is obviously in a phasing-out mode and Russian foundations and sources are taking its place.
To mention some examples here:

- INTAS, the International Association for the Promotion of co-operation with Scientists from the New Independent States of the Former Soviet Union provided in the period 2002-06 more than € 50 million to Russian R&D; but this organisation has since 2006 ceased to launch new funding activities and will be finally closed in 2010.[51]

[48] HSE, Indicators of Innovation Activity: 2009. Statistical Databook. Moscow. 2009.
[49] Ministry of Transport of Russia, Ministry of Information Technologies and Communication of Russia, State Corporation Rosatom, RAO United Energy Systems (UES) Russia and JSC Russian Railways
[50] OECD, MSTI 2008-2.
[51] International Association for the Promotion of co-operation with Scientists from the New Independent States of the Former Soviet Union (INTAS). A bridge to partnership in research. Activities over the FP6 Period 2002-2006, Brussels.

- Funding from the EU for the International Science and Technology Center (ISTC) in Moscow, an international organisation providing financial support for conversion of military to civilian research, has been slashed to a quarter of previous levels and reached in 2009 only € 5 million.[52]
- Also foundations from the USA, such as the Civilian Research and Development Fund (CRDF) have reduced their engagement in Russian R&D.

These trends do not mean that international S&T cooperation with Russia would decrease. On the contrary, in a survey among European R&D funding bodies conducted in the frame of the ERA.Net RUS project in 2009, it was confirmed that new bilateral S&T cooperation programmes with Russia were launched, budgets were increased and responding organisations confirmed their perspective of further increasing S&T cooperation with Russia.

An interesting involvement of foreign funding concerns venture funds, which are being formed in Russia's regions with the support of EBRD, Russian Venture Company, Ministry for Economic Development, and regional authorities.[53]

The foreign funding for R&D in Russia in 2005-2007 came from a variety of sources: intergovernmental organisations (22%), foreign ministries and agencies (19.7%), state research centres (23.7%), universities (10.4%), non-commercial foundations (10.4%), corporations / companies/ enterprises (61.9%), and other sources (6.4%)[54].

5.3 Funding of regional programmes

Russia is the largest country in the world in terms of area, which spans over ten time zones. The Russian Federation is a federal state, structured into Subjects of the Federation; these are 46 regions (oblast'), 21 republics, 4 autonomous districts (okrug), 9 territories (kray), 2 federal cities (Moscow, St. Petersburg) and 1 autonomous region (avtonomnaya oblast'). Federal subjects are regrouped for governance purposes into eight Federal Districts, overseen by representatives of the President. In the following the term region(s) is used generally, referring to all Subjects of the Federation.

R&D policy is shaped and implemented predominantly at the federal level, by government and responsible ministries, above all the Ministry of Science and Education. The regions have de-facto limited tasks and resources for R&D available. Several regions have developed their own regional S&T programmes, which target the respective regional R&D capacities and which are more focussed on the innovation and industrial component of R&D. Regions have the right to pass own legal norms on regional R&D policy and have the right to establish and close scientific organisations and R&D funding bodies in their region.

Russia is a vast country with lots of sparsely populated areas. R&D capacities are concentrated in certain Russian regions and especially in and around big cities. In first place Moscow and Moscow region should be mentioned here. Second comes the second biggest city St.Petersburg and then follow a range of important regional centres, such as Rostov-on-Don in the south, Kazan and Nizhny Novgorod in the Volga Federal District, several big cities in Siberia: Irkutsk, Krasnoyarsk, Novosibirsk, Tomsk, and in the Urals: Yekaterinburg.

[52] See www.istc.ru and ISTC annual reports accessible at this website.

[53] http://www.jourclub.ru/3/107

Dezhina, Irina. Funding of Russia's science: new forms and mechanisms// Voprosy Economiki, 1996, #10; Innovation management: reference book / ed. by P. Zavlin, A. Kazantsev, L. Mindeli.2nd edition. Moscow: Center for Science Research and Statistics, 1998; Nekhamkin A. S&T policy funding: creation of an investment fund system // Finansy. #6, 1997; Newspapers: Rossiyskaya Gazeta, Finansovye Izvestiya.

[54] Expert survey; multiple responses were possible, therefore the total exceeds 100%. Center for Science Research and Statistics, 2007. / http://www.csrs.ru/English/indexen.htm

5.3.1 Regional responsibilities

According to the constitution of the Russian Federation and the respective federal law, responsibilities for S&T policy are shared between the Federation and the Subjects of the Federation (regions). Regions have accordingly the following relevant competencies:

- participating in the development and implementation of state S&T policy,
- determining regional S&T priorities
- developing regional S&T programmes and projects
- providing funding for S&T programmes and projects from regional budgets
- setting-up and managing foundations or other bodies for the management of such programmes
- setting-up, managing and liquidating public regional research organisations

Determining regional priorities is a rather important competence. For regional priorities, which match with the federal priorities, jointly federally and regionally funded S&T support programmes can be set up.
Several regions have set up their own laws regarding S&T policy.

5.3.2 Regional research governance

More than 30 regions have in the last years established their own S&T support programmes, including Moscow, St. Petersburg, Nizhny Novgorod, Novosibirsk, Tomsk, Tatarstan, etc. These programmes are targeted at support of the respective regional S&T capacities. They are managed by the regional and city administrations.

The most important public research organisation, the Russian Academy of Sciences (RAS) has three regional subdivisions:

- the Siberian Branch,
- the Far Eastern Branch and
- the Ural Branch.

The regional branches dispose of own budgets. Additionally the RAS has 14 regional research centres, e.g. in St. Petersburg, Karelia, etc.

Research funding bodies are also represented in the regions. The Foundation for Assistance to Small Innovative Enterprises (FASIE) has a broad network of regional offices.

5.3.3 Regional research policies and programmes

More than 30 regions have in the last years established their own S&T support programmes which focus on applied research and innovation.

- Programme on applied scientific research and projects in the interest of the city of Moscow, for the period 2009-11, with a budget of RUB 12 292 million (€ 351.2) , the Moscow programme is for the regional level quite substantial.
- St. Petersburg Targeted Programme for S&T Development: Development of Innovative Technologies in Industry, 2006-2008, budget: RUB 373.3 million (€ 10.7 million)
- Republican programme on the development of innovative activities in the Republic of Tatarstan, for the period 2004-10

Another tool for regional R&D support is implemented in the form of regional venture funds. Such venture funds have been set up for example in St. Petersburg , Tatarstan, and Nizhny Novgorod. The funds provide above all venture capital for support of early stage industrial

production. Some regions have also set up foundations for support of R&D; this concerns for example the St. Petersburg Regional Foundation for Scientific and Technological Development.
An important player at the regional level is the Russian Academy of Sciences: its regional branches, the Siberian branch, the Ural branch, and the Far Eastern branch of RAS, are operating relatively autonomously and have their own substantial budgets available.
Competitive R&D funding bodies such as the Russian Foundation for Basic Research (RFBR) and Foundation for Assistance to Small Innovative Enterprises (FASIE) implement regional calls, which are partly co-funded by the regions. FASIE is also supporting the establishment of regional innovative-technological centres, which are kind of technoparks linked to R&D institutions.
At the municipal level several cities have developed their own S&T support schemes. E.g. Municipal Targeted Programme on Cooperation between City Administration and Scientific and Industrial Complex of Novosibirsk, targeted at Novosibirsk City Development.

Data on regional R&D are sparse for Russia, one of the reasons being that regional support tools for R&D have been established only in recent years.

5.3.4 Important R&D policy documents relevant for regions

The distribution of competencies in S&T policy between the federal government and the regions is defined in article 12 of the federal law on "Science and State Scientific-Technological Policy".
In national R&D strategy documents only few remarks refer to regional research policies. Regional R&D strategies are defined at the regional level and laid down usually in documents of respective regional funding programmes. Examples for such programmes, which focus on applied research and innovation.

- Programme on applied scientific research and projects in the interest of the city of Moscow, for the period 2009-11
- Republican programme on the development of innovative activities in the Republic of Tatarstan, for the period 2004-10
- In St. Petersburg R&D policy is part of the broader Programme for socio-economic development of St. Petersburg for the period 2008-11.

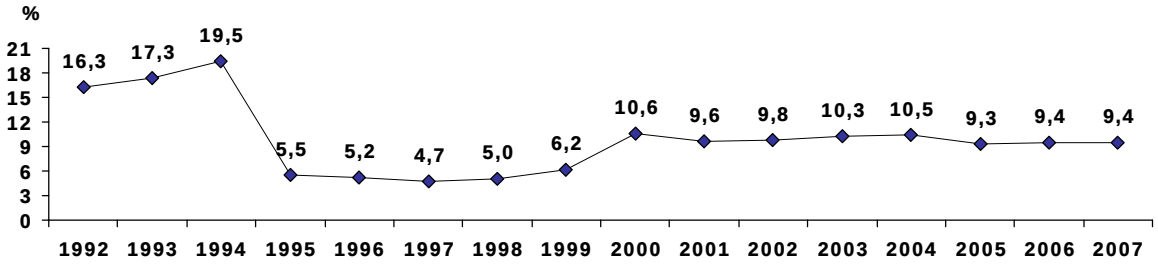
6 Key issues and trends

6.1 Impact of S&T and innovation funding

Economywide, the effect of innovation activity is hardly noticeable. In 2008 receipts from technology exports amounted to USD 833.2 million. For comparison this figure for United Kingdom reached USD 34621.8 million, for Germany USD 42739.4 million, for USA USD 85919.0 million and for Japan USD 21080.1 million. The most important categories in Russian receipts from technology exports are R&D and engineering services.

Figure 8 below shows the share of enterprises, which are engaged in technological innovation. After a sharp decline in the mid-1990s, the indicator started growing again from 1997, but is since the year 2000 stagnating around 10%.

Figure 8. Enterprises engaged in technological innovation

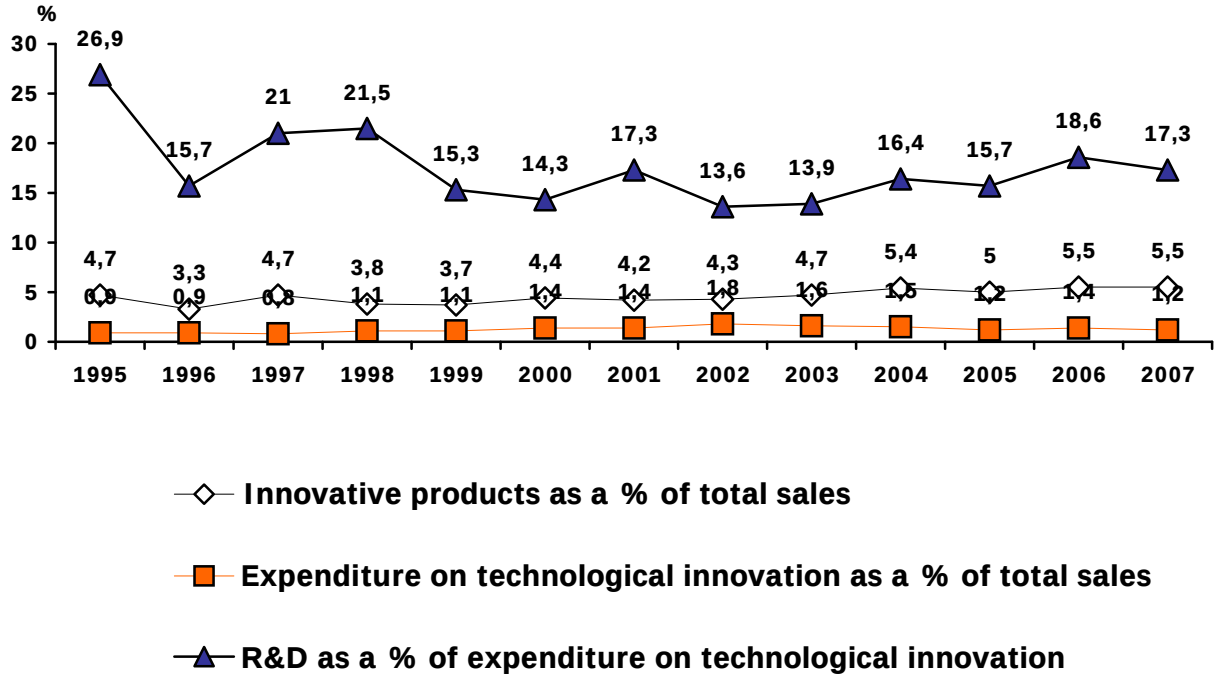


Sources: *HSE, Indicators of Innovation Activity, 2009. Statistical Databook, Moscow, 2009.*

The ratio of the total sales volume of innovative and non-innovative enterprises in Russia makes up 48.2 and 51.8% accordingly. Russian innovative enterprises exceed only the level of Bulgaria (39.7%) and are only half as high as in Germany, where the indicator reaches its maximum value (91.3%).[55] Thus, despite all efforts, the effectiveness of innovations in the overall Russian industrial production remains low. This conclusion is supported by the dynamics of the volume of innovative products: in 1995-2007 its absolute value grew only by 77%, while innovation expenditure grew more than twice during the same period. As a result, the return on innovation expenditure declined from RUB 5.5 to RUB 4.4 per one Rouble of technological innovations' expenditure.

[55] HSE, Indicators of Innovation Activity, 2009. Statistical Databook, Moscow, 2009.

Figure 9. Innovation expenditure trends



Sources: *HSE, Indicators of Innovation Activity, 2009. Statistical Databook. Moscow, 2009.*

The low effectiveness of innovation activity noticeably weakens the competitiveness of Russian producers on external markets. The products, which did not undergo any technological changes, constitute the major part of their exports. The volume of exports of innovative goods, works and services in 2007 amounted to RUB 276.3 billion; despite its considerable growth in the last two years, its share in the total volume of exports of goods, works and services of industrial enterprises made up only 7.9%. The real value of this indicator surpassed its target indicators in the national S&T and Innovation Strategy. The discrepancy is explained by the increase of the exports share of high technology manufacturing activities, first of all, chemical industry (21.6% versus 16.2% in 2006), as well as extraction industries, including extraction of mineral resources, with the exception of fuels (6.0%).

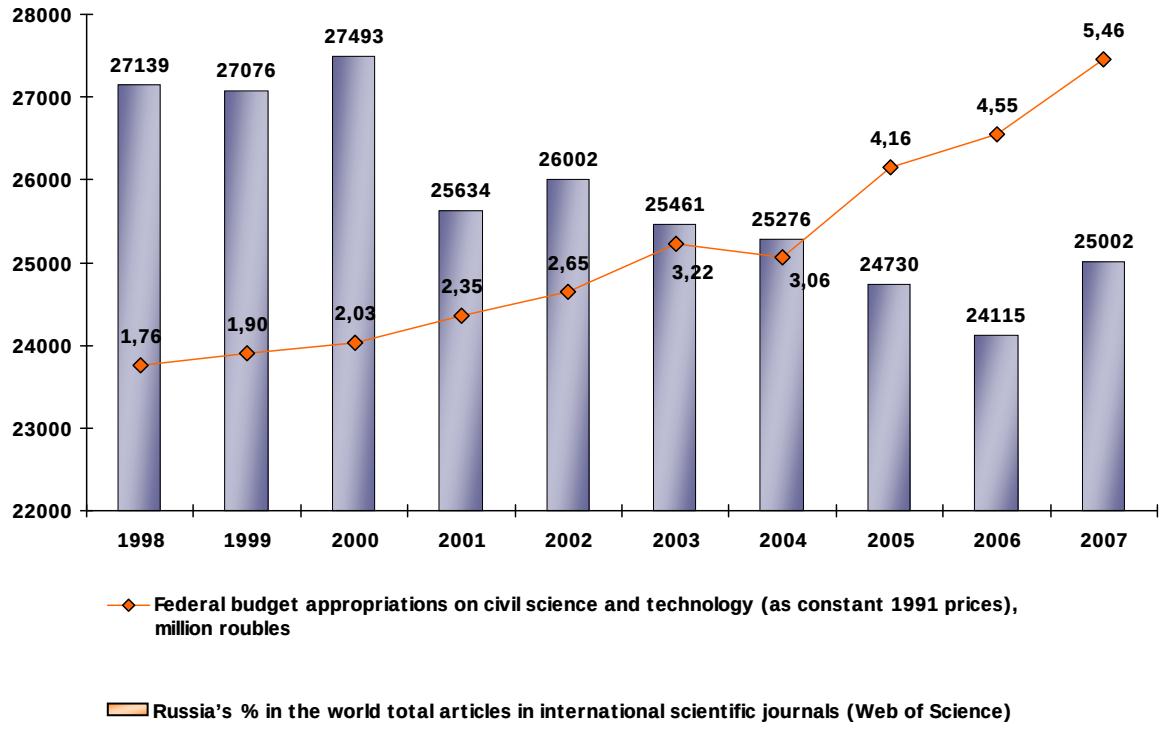
The current S&T development in Russia is still affected by rather conflicting trends. On the one hand, the government R&D funding is growing: Federal Budget Appropriations (FBA) on civilian R&D in 2004-2007 grew by 54% in real prices. About 39% of the government funds were allocated to support basic research. Financial support of R&D through contracts, programmes and tenders has also grown. The number of researchers has stabilised (392 thousand, 49% of R&D personnel in 2007). The number of staff employed by private research institutions' is increasing (17% of growth since 2000). However, the level of Gross Domestic Expenditure on R&D (GERD) as percentage of GDP still lags behind the world's economic leaders.

On the other hand the stagnation of the S&T sector is evident. It stems from both insufficient demand for and underdeveloped or inappropriate supply of R&D and technologies. Private business does not show much interest in innovation. Since 2000 the innovation activity has remained at a level of 9-10%. The EU economies indicators are significantly higher. By the end of 2008 investment in innovation was considered by private businesses to be more risky and less profitable than investment in mining and quarrying activities. Demand for R&D

came mostly from the government, and the federal budget remained the key source of R&D funding (in 1998-2007 it grew 3-fold in real prices).[56]

Despite the high rate of economic growth achieved before the global crisis beginning in 2008 Russia could not compete with the world leaders. Comparatively low levels of indicators such as R&D expenditure calculated as share of GDP, scientists' publication activity, innovation activities of enterprises remained almost constant throughout the period of market reforms, including the years of economic growth. Due to many reasons (very often external to R&D, innovation and even production spheres) companies still aren't really interested in the intellectual component of innovation process. Within the structure of technological expenditures the main efforts are made on acquisition of machinery and equipment (in most cases imported from abroad). Successful R&D organisations are forced to collaborate rather with foreign companies and international organisations. Higher education institutions have not yet become substantial players in the innovation sphere. On the national economy level the overall effect of R&D and innovation activities is almost invisible. Only high-technology sectors show a certain progress (relatively higher levels of innovation activity and efficiency).

Figure 10. S&T Performance vs. R&D expenditure



Sources: *HSE, Science Indicators, 2009. Statistical Databook. Moscow, 2009.*

The specifics of S&T and innovation management (including dependence on government support) cause a wide scope of short- and medium-term risks:

- further reduction of entrepreneurs' demand for R&D products; weakening of cooperative interdisciplinary links throughout the whole R&D and innovation cycle;

[56] Indicators of Innovation Activity: 2009. Statistical Databook. HSE, Moscow, 2009. HSE, Science Indicators, 2009.

- limitations affecting the knowledge-generation environment (regarding all kinds of resources and periods of time);
- deterioration of the qualifications of the human resources (science, education, high-technology sectors);
- low capabilities of the NSI for international cooperation;
- further downgrading of innovation activities;
- short range and share of non-government funding sources, increasing pressure on the federal budget.

S&T and innovation in Russia as well as in other developed countries are based on a rather complex relationship between three groups of actors: actors providing knowledge, those who control and regulate this process, and actors applying the results. Taking into account the mentioned negative factors, the primary goals for Government S&T and innovation policies could include the following six components:

1. promotion of technology transfer (protection of intellectual property rights, building innovation infrastructure, organisational innovation, etc.);
2. creating favourable environment for S&T and innovation activities, direct support to S&T;
3. development of public–private partnerships (PPP), incentives for private sector to co-fund and participate in S&T and innovation projects initiated by the government;
4. promotion of innovation activity and improvement of innovation climate (support to efficient innovators, creation of a competitive environment, improving legislation);
5. increasing level of professional education, e.g. in the field of innovation management;
6. ensuring the prospects of the long-term sustainable technological development.

The practice of developed countries shows that all efforts to create these as well as other frameworks, and to work out relevant transformation schemes and procedures (including the fundamental reforms of the government S&T sector) appear to be even more efficient than direct budget subsidies to S&T activities. In any case the effects depend on adequacy of goals, real substance and scales of government initiatives.

The practical measures provided by the Government on reorganisation of national S&T during the last 15 years had not always a positive effect. They had not resulted in deep science integration into market economy as well as in increasing impact on the social and economical progress. As a result, many parts of the NSI nowadays still keep the features left from the centralised economy, while relevant and efficient policies were lacking. Changes of the situation will strongly depend on the success of measures aimed at improving the overall business environment, the economic stability, and the rule of law.

Some success in this direction can be observed mostly within the groups of policy agenda mentioned above under components (1) and (2). Some positive shifts exist within integration of science and education, creation of research universities, introduction of courses for training of skilled managers for high-tech sectors et al (5-th group of the policy actions). For the other above-mentioned issues the Russian Government does not demonstrate so far deep interest in real improvement of innovation process. The modest success of S&T and innovation policy (and even its partial collapse) is to a certain extent determined by the lack of coordination between different elements of such policy, between government bodies dealing with S&T and innovation issues, etc.

In general specific actions in the areas described in groups (3) – (5) above are planned as part of the CLTD strategy. Their implementation will start in 2009. Implementation of government policies described in the Long-Term Development Concept will ultimately allow dealing with the main systemic problem of the Russian S&T complex – combination of inefficient use of resources allocated to the R&D sector and insufficient demand for innovations by businesses. This should lead to improvements in quality and supply of domestic R&D products and

technologies, as well as to increased demand by the real sector of the economy for technologies and innovations.

6.2 Public-Private Partnerships (PPP)[57]

During the past years Public-Private Partnerships (PPP) has become an important mechanism of state-business relations in Russia. Successful foreign PPP experience, acute necessity for infrastructure development in Russia, as well as a growing interest of Russian companies in entering new fields of activity resulted in active moves towards PPP development from the part of the state authorities in Russia. What concerns the S&T sector, by means of PPPs the government is trying to attract private money for R&D. The economic growth up to the year 2008 and political stability have facilitated this process.

The Government of Russia formulated strategic tasks for various government bodies, for implementation of which the state should cooperate with business using the PPP mechanisms. These tasks are[58]:

- Raising the quality of life of the population, support to human capital development;
- Elimination of structural limitations to economic growth;
- Support to increased competitiveness of the Russian companies, strengthening of their positions in domestic and external markets;
- Social-economic development of Russia's regions;
- Integration of Russia in the world economy.

Structural and technological transformations, necessary for raising the pace and contributing to sustainability of economic growth, according to the Government, require public-private partnership in the sphere of S&T with considerable attraction of non-budgetary funds. At the same time, the state will retain property rights only for objects of strategic importance. Thus, the Government plans to prioritise implementation of large infrastructure projects and creation of new sources of growth in the sphere of high-tech and knowledge economy.

In Russia there is some basic **regulatory, legal and institutional framework for PPP**. Greater attention to PPP concept at the higher political level of the country led to creation of the system required for PPP projects implementation. At present the activity in the frame of PPP is regulated by the general legislation (Civil Code, Budget Code and other), special laws (federal law "On concession agreements", federal law "On free Economic Zones" and other), as well as sectoral laws and regulatory-legal acts (federal law "On Special Features of Governance and Disposal of Property of Railway Transport" and other). Overall, the regulatory and legal basis for PPP is in its initial phase of development, albeit it advances rapidly. The adoption of the federal law "On concession agreements" in 2005 allowed creating conditions for application in Russia of one of the most popular PPP forms used in Western Europe, which are concessions. The adopted law contains a number of important provisions for further PPP advancement; however this factor alone was insufficient. Due to many issues remaining unresolved, the law still does not function properly. No concession agreements were concluded in 2005-2006 and up to now it has relevance mainly for the improvement of infrastructure.[59]

In the institutional sphere, Investment Fund of the Russian Federation, Russian Venture Company and special economic zones were created. At the stage of planning large-scale

[57] See for details on PPP Litovchenko S. et al. National Report "Risks of Business in Public-Private Partnership". 2007. Prepared by UNDP and Russian Managers' Association.

[58] Key Activity Directions of the Russian Federation Government till 2008 (from 28 July 2004). www.government.ru

[59] For example in 2007 a concession agreement was concluded for the construction of the highway Moscow ring road.

investment projects, companies got the possibility to obtain support from the state with the use of a range of PPP instruments at federal and regional levels.

Four Special Economic Zones (SEZ) for Technology Development have been established as a result of a competition in 2005 in St. Petersburg, Tomsk, Zelenograd and Dubna (the latter two situated in the surroundings of Moscow).[60] All four zones have been created around important public science centres, to which private companies shall be attracted with the incentive of tax breaks. Companies settling in the SEZs are exempt from property and land taxes for a period of 5 years and can apply reduced rates for social taxes. It is an effort to stimulate the development of market ready innovative products, by bringing the major actors in such a process next to each other. SEZs are under the governance of the Ministry of Economic Development.[61]

6.3 Reform of the budgeting procedure

The method, currently employed for raising the efficiency of budget spending in Russia is **results-based budgeting (RBB)**. The regulatory and legal basis of RBB is the Concept for budget process reform in the Russian Federation for the years 2004–2006, approved by the Decree of the Government of the Russian Federation from 22 May 2004 #249 "On measures, increasing the efficiency of budget spending". The budget reform, according to this Concept, is aimed at "creation of conditions and preconditions for the most efficient governance of state (and municipal) finances in line with priorities of the state policy".
The existing RBB experience allows to formulate a number of requirements to indicators, that need to be included in the monitoring and evaluation system: relevance, validity and completeness; precision, statistical reliability; neutrality; veracity; scalability of the system; possibility for application; comparability; economic feasibility; transparency; continuity, timeliness and regularity; accessibility and clearness. These are criteria, which are used for evaluating the methodological reliability of budget spending efficiency.
The new **Results-based medium-term budgeting approach**, implemented in Russia from 2009, possesses the following important characteristics:

- Long-term budget stability and sustainability
- Revenue and expenditure assignments for federal, regional and local budgets
- Multi-year (3-year) budgeting
- Performance budgeting
- Public sector restructuring.

The broad approach to performance budgeting in Russia implies several dimensions. «Political» dimension introduces responsibilities of the federal, regional and local authorities and their (political) accountability. The «market-based» dimension implies provision of public service delivery on (partly) competitive basis. The «Administrative» dimension sets the stimulus and appraisal of the line ministries' performance.

[60] The legal basis for Special Economic Zones is the federal law #116 from 22 July 2005 "On special economic zones in the Russian Federation", which was enacted on 25 August 2005. Later on, in 2006 amendments to this law were adopted by the federal law #76 from 3 June 2006 "On amendments to the federal law "On special economic zones in the Russian Federation". The law is aimed at establishing favourable conditions for developing the Russian economic and scientific potential through the creation of Special Economic Zones (SEZ).
[61] See for further information (in Russian):
http://www.economy.gov.ru/minec/activity/sections/specialEconomicAreas/

6.4 Strategic planning[62]

In the Russian context, administrative reform denotes reforms connected to the structure, processes and functions of government. It includes approaches to managing government performance (strategic planning, performance management, internal accountability), and approaches to improving service delivery and responsiveness (transparency, service quality programmes and external accountability). An administrative reform was launched in Russia in February 2003 with an internal order issued by then President Putin setting out its basic directions. In October 2004, the administrative and budget reform processes were brought together within a Commission led by Deputy Prime Minister Zhukov, and a Programme for Administrative Reform was subsequently prepared.

Currently the following strategic planning instruments are in place:

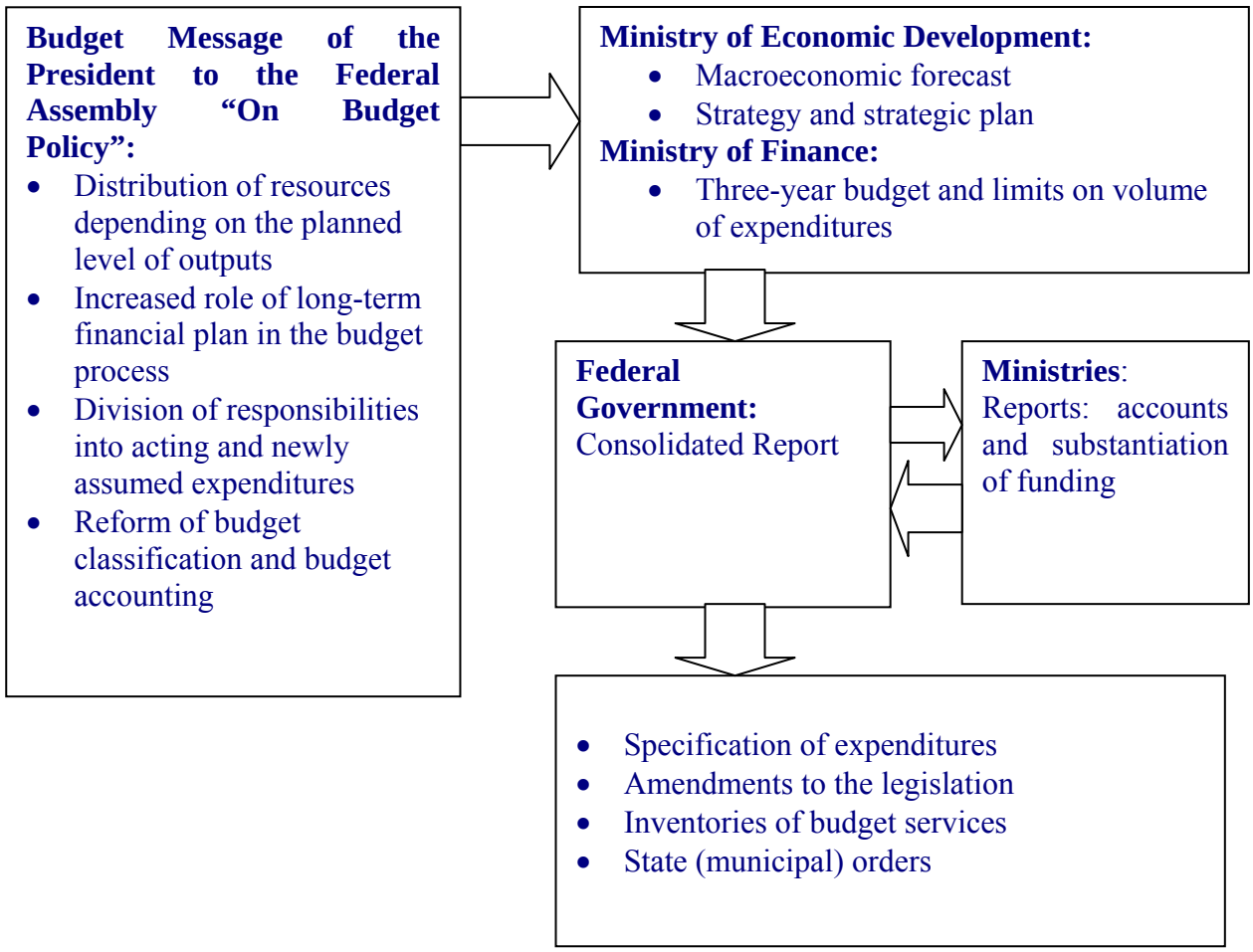
- Mid-term country's development strategy;
- Sectoral strategies;
- Federal system of goals and tasks: the "goal tree" of the Government;
- Reports by the ministries and agencies: description of activity and competition;
- Strategic three-year plan: Consolidated Report of the Government;
- Three-year budget as the basis for Strategic plan.

Measures planned for implementation include:

- Long-term Strategy of the RF;
- Strategic Plan and three-year budget;
- Usage of Reporting for performance evaluation of ministries' and agencies' substantiation of budget appropriations.

[62] See for strategic planning issues:
Increasing Government Effectiveness: Approaches to Administrative Reform in the Russian Federation. Yelena Dobrolyubova, Gord Evans, Nick Manning, Neil Parison. Yuliya Shirokova. May 2005. Moscow. The World Bank;
L. Bogdanov. Interconnection of strategic planning and budgeting process in RF regions. Presentation at the Forum "Strategic Planning 2020", St.Petersburg, 2008.

Figure 11: Interconnection of strategic planning and results-based budgeting



One of the weak spots of the Russian innovation policy is monitoring and evaluation. Analysis of change, which has occurred as a result of decisions by policy-makers shall become the basis for evaluation of S&T activities and introduction of necessary changes to strategy. Consequently, the federal ministries and agencies, charged with S&T issues, started planning their results and developing performance indicators.

There are two main approaches used in the Russian, as well as international practice of statistical monitoring of S&T funding. The first implies collection of data from contractors, i.e. organisations implementing R&D. In line with this approach, annual GERD for R&D implementation is the key statistical indicator of R&D scale.

The second approach to measurement of S&T funding implies gathering data from funding agencies. In 1995-2001 in Russia data on S&T funding was gathered (for later assessment) in line with statistical forms approved by the Ministry of Education and Science. In this statistical survey data are being gathered from federal ministries and agencies, state scientific centres, as well as on implementation of federal targeted programmes. The data was gathered on actual expenditure made in the previous year, planned appropriations for the current year and application for the following year.

Importantly for international benchmarking, Russia is for several years already collecting data according to OECD and EUROSTAT standards and is included in relevant datasets of these organisations. This facilitates comparison and policy making, although several methodological problems with data in Russia have to be taken into account; for example the business/enterprise sector in Russia is dominated by public or partly publicly owned companies, which biases benchmarking of private S&T and innovation funding sources.

Large Federal Targeted Funding Programmes were introduced over the last years, through which R&D funds are distributed in competitive tendering procedures. For these programmes an evaluation of programme implementation is foreseen.
It should be noted that for evaluation of project proposals to the Federal Targeted Programmes as well as to R&D funding bodies such as the Russian Foundation for Basic Research and the Foundation for Assistance to Small Innovative Enterprises, usually only Russian experts are consulted for evaluation. But an opening-up process is taking place here: scientists from abroad shall be more frequently involved in evaluations in Russia to avoid biased results and circumvent well established national expert networks. For example, for evaluations of proposals in the framework of one funding line of the Federal Targeted Programme Scientific and Scientific-Pedagogical Personnel of Innovative Russia foreign experts were involved. In February 2010 the Ministry of Education and Science decided to further enhance involvement of foreign scientists in evaluations in this programme.
National information and analytical centres have been established to monitor the effectiveness of public scientific organisations. The Russian Federal Service for Surveillance of the Educational and Scientific Sector has been established in 2004 as an agency of the Ministry of Education and Science and fulfils some quality control tasks for the educational and scientific sectors.
Regular evaluation of public scientific centres shall be institutionalised and be used as a basis for funding allocation to these institutions. A concept for this evaluation has been prepared by the Ministry of Education and Science in cooperation with the University – Higher School of Economics. This concept has been discussed with the scientific community in autumn 2008. Discussions focus on the indicators to be applied for evaluating institutions, such as citations, patents, amounts of competitive funding acquired, etc.

6.5 Data overview

Table 8. Key development indicators of the Russian S&T after 1999 (2000-2007)

	2000	2001	2002	2003	2004	2005	2006	2007
Gross Domestic expenditure on R&D (GERD) at constant 1989 prices (bln RUB)	3.3	3.9	4.3	4.8	4.6	4.6	4.9	5.6
GERD as a % of GDP	1.05	1.18	1.25	1.28	1.15	1.07	1.08	1.12
Federal Budget Appropriations (FBA) on civil S&T at constant 1991 prices (mln RUB)	2.0	2.35	2.65	3.22	3.06	4.16	4.54	5.5
FBA on civil S&T as a % of GDP	0.23	0.26	0,28	0,31	0.28	0.36	0.36	0.4
R&D personnel per 10 000 employed	138	136	133	130	126	122	122	135
Patent applications with the indication of Russia in Russia (thousand)	28,7	30,0	29,2	30,7	30.2	32.3	37.7	39.4
Patents granted (thousand)	17.6	16.3	18.1	24.7	23.2	23.4	23.3	23.0
Technology balance of payments (mln USD)	20.6	-153.8	-361.0	-428.7	-439.0	-564.8	-595.0	-796.0
R&D institutions	4099	4037	3906	3797	3656	3566	3622	3957
among them: industrial enterprises	33	31	34	28	31	30	49	–

Sources: *HSE, Science Indicators, 2009*; *Statistical Databook, Moscow, 2009*.

7 Results of SWOT analysis of the Russian S&T and innovation funding system

The Russian S&T and innovation funding system has experienced over recent years a range of positive developments, but features still several weaknesses. A SWOT analysis has been undertaken in the frame of the ERA.Net RUS project, to outline these Strengths and Weaknesses, but also Opportunities and Threats to the S&T and innovation funding system. While Strengths and Weaknesses refer to features internal to the S&T funding system, the Opportunities and Threats discuss external influences on it. The findings of this SWOT analysis are presented in this chapter.

7.1 Methodological approach

To study the S&T and innovation funding system, several methodologies were used:

Literature study: An active discussion process on the status of S&T and innovation and its funding schemes is ongoing within Russia. These discussions are made transparent and are accessible in Russian at the dedicated science websites "Science and Technology of the Russian Federation",[63] which is sponsored by the Ministry of Education and Science, and at the website www.scientific.ru. Other important sources of information are journals for the scientific community such as POISK[64] and Troicky Variant[65]. Information on S&T, especially on the innovation and business oriented side, is provided in daily newspapers such as Kommersant, Nezavisimaya Gazeta, and others. The discussion on this topic has intensified in the media in recent years, the reason being that the Russian President has set a modernisation of the economy built on using the still available substantial S&T base on top of his agenda. Ministries[66], some policy advisory bodies[67] and funding agencies make available details on their civilian funding schemes on their internet sites and such sources have also been taken into account. Analytical reports and publications prepared by experts of University – Higher School of Economics and of Centre for Social Innovation, as well as results of analytical work performed in projects EU Framework Programme for RTD, such as Scope-East and Rusera, have been studied.

The second methodological approach concerned a **survey and in-depth interviews** with the main Russian S&T funding organisations, which were conducted in 2009. Until end of January 2010 the following Russian Programme Owners have been surveyed and interviewed:

- Federal Agency of Science and Innovation (FASI or Rosnauka)
- Foundation for Assistance to Small Innovative Enterprises (FASIE)
- Ministry of Economic Development (Mineconomrazvitiya)
- Ministry of Education and Science (Minobrnauki)
- Ministry of Industry and Trade (Minpromtorg)
- Russian Academy of Sciences (RAS)
- Russian Corporation for Nanotechnologies (Rusnano)
- Russian Foundation for Basic Research (RFBR)
- Russian Foundation for Humanities (RFH)
- Russian Venture Company (RVK)

[63] See www.strf.ru
[64] See www.poisknews.ru
[65] See http://trv-science.ru/
[66] Especially the Ministry of Education and Science website is a relevant information source: www.mon.gov.ru
[67] Information on sessions of the Presidential Commission for Modernisation and Economic Development is available at www.kremlin.ru and at http://www.i-russia.ru/

In the survey details on programme management of funding schemes, evaluation procedures etc. were questioned. In follow-up interviews, which were conducted with representatives of the funding organisations, these aspects were discussed in further detail, including on perceived Strengths and Weaknesses of the S&T and innovation funding system.[68]

Finally, the third methodological component used was a **"Focus Group" meeting** with selected scientists.[69] The focus group was held in March 2010 in Moscow. Seven Russian scientists covering a broad range of scientific disciplines (mathematics, biology, aerospace, information technologies, medical sciences), as well as basic and applied research, and the university, research institute and company sectors were participating in the meeting. In a round table discussion, scientists expressed their views on improvements and problems with S&T and innovation funding in Russia.

The information gathered has been analysed and the results are presented in this chapter. First an overview of SWOT results is presented in table form. In sub-chapters the arguments are then discussed in more detail. The aim is here to provide a kind of inventory of critical issues. It is not intended to establish an exhaustive list here, but to give hints to key problems, which need to be tackled. But obviously, perceptions on critical issues differ. Some readers will find certain issues not critical or some may find important issues missing.

[68] For the interview guideline see Annex 9.4.
[69] The concept for the Focus Group meeting is available in Annex 9.5.

Table 9: SWOT of the Russian S&T and Innovation Funding System

Strengths (internal factors)	**Weaknesses (internal factors)**
- Move to competitive S&T funding (FTP, RFBR, FASIE, RFH) - strengthening of evaluation and accountability - relative high S&T investment in comparison to competitors - funding of basic research - improvements in innovation funding and innovation infrastructure - substantial amounts of funding and support of big projects through FTPs - FTPs allow for various categories of participants - various programmes for attracting foreign scientists for research, as well as for evaluation (FTP Personnel and other) - involving foreign scientists for evaluation (FTP Personnel) - funding of coordinated calls with FP7 (out of FTP Priorities)	- intransparencies of S&T funding (e.g. defence R&D budget, project selection process) - low/negligible private S&T funding (weak innovative company sector) - domination of state sector in S&T funding - nearly no international evaluators used for funding decisions - slow reform of the institute sector - budgetary cuts of 30-70% in 2009/10 on FTPs, RFBR as a result of financial crisis; - lack of funds for projects already selected for funding (FTP's & RFBR, RFH) in 2009/10 as a result of financial crisis - legal problems with tendering law (94-FZ – public procurement): time constraints, cheapest price is selected for funding, one organisation can submit only one proposal per lot - limited competition in some lots/FTP's - limited amount of co-funding from private industry/non-budgetary sources
Opportunities (external factors)	**Threats (external factors)**
- increases of S&T investment (economic policy priority; as well as a result of GDP increases) - regulatory improvements: tax exemptions for S&T activities - innovation policy high on the agenda of policy makers (president, prime minister) - international interest in S&T cooperation with RU and vice versa - FP7 association - Other multilateral funding tools: ERA.Net RUS Pilot Joint Call, EUREKA, Competitiveness & Innovation Framework Programme (CIP) association	- Policy factors: political tensions with EU, NATO, etc. - current economic crisis: repercussions on S&T funding - declining S&T investment from abroad as a share of GERD - lack of budgetary funds for covering the planned budgets of FTP's - regulatory framework and its application - industry structure: focus on few large R&D intensive businesses, but few innovative SMEs yet

7.2 Strengths

7.2.1 Volume and allocation mode

- Investment in R&D and innovation activities is in comparison to other countries substantial. With Gross Domestic Expenditure on R&D (GERD) slightly above 1% as a share of GDP, Russia is not in the top group of countries with high R&D spending, but has in comparison to several EU member states a higher R&D expenditure and is on this indicator approximately on a par with Italy or Spain.
- The volume of funding for R&D and innovation has in absolute figures over recent years remarkably increased, which is due to substantial GDP growth rates.
- New substantial competitive funding programmes (so called Federal Targeted Programmes - FTPs) have been introduced. For some R&D projects funding is now higher than in EU member states.
- The Foundations for competitive R&D funding, the Russian Foundation for Basic Research (RFBR), the Foundation for Assistance to Small Innovative Enterprises (FASIE) and the Russian Foundation for Humanities are key partners for many S&T organizations and have acquired a good level of trust.
- New programmes for strengthening the R&D component in the university sector have been introduced in recent years, e.g. the National Research University Programme. The competition for research universities was held rather fairly, as judged by the selection of winners – the leading Russian universities were selected for support. Such big grants with substantial overhead costs as allocated within this programme will make universities recruit qualified staff. The overall volume of funding may surpass grant funding and allow researchers at universities to do science and reduces the need to write grant applications.
- The shift to competitive R&D and innovation funding is touching the whole S&T sector. Also more rigid environments, such as the Russian Academy of Sciences, have introduced competition based funding allocation. The internal grant sources have increased steadily over time and concern the whole S&T sector: Academy of Sciences, RFBR, MON, other ministries (e.g. Ministry of Agriculture) and other state agencies.
- A shift in mentality occurred as a result of the gradual change to a competitive grant system. Scientists got accustomed to care themselves for funding and to write proposals for grant competitions, and not to rely any more solely on block grant funding allocated by the state.

7.2.2 Structural Strengths

- Infrastructure for applied research and innovation and respective funding tools are getting improved and have been developing especially over recent years. This concerns for example regional venture funds, Rusnano, SEZs, RVC, Technology Transfer Offices (TTOs), FTPs, tax breaks.
- Online applications and reporting procedures are valued by scientists and mentioned as a positive development; this concerned for example procedures of the Federal Agency for Education (Rosobrazovanie), an agency, which was disbanded in March 2010 and reintegrated in the Ministry of Education and Science.
- Access to latest international scientific journals and other scientific resources was obtained, e.g. in the Academy of Sciences. Access to up-to-date scientific literature is a major achievement of increased R&D funding.
- Improvements in equipment and scientific infrastructure have taken place over the last years; e.g. in several institutes of RAS or at certain universities, the equipment and other

infrastructure have a lot improved and are of comparable quality or surpasses that of Western competitors.
- Government policy tries to internationalise the S&T and innovation system through specific funding measures. For example the FTP for Scientific Personnel includes a funding line to attract emigrated scientists to work with colleagues in Russia. In addition, foreign scientists shall be attracted to work at Russian R&D institutions and they shall also be more involved in project evaluations.
- Monitoring and evaluation of funding programmes become more important; S&T and innovation funding becomes overall more transparent.

7.3 Opportunities

- Increases of S&T investment may be expected as the economy picks up again and GDP increases. OECD forecasts GDP growth of 5.5% for the year 2010.[70]
- Regulatory improvements are only slowly implemented, but still they do occur. Tax exemptions for R&D activities have been introduced; regulations for involving foreign scientists in Russian R&D may be expected to be simplified. And another example concerns the federal law 217 (217-FZ), which allows creating spin-off companies from state universities and research institutes.
- Innovation policy is high on the agenda of policy makers (President, Prime Minister) and accordingly support for applied research and innovation is being increased.
- International partners have confirmed their interest in S&T cooperation with RU and vice versa; e.g. this was confirmed in an ERA.Net RUS survey among S&T funding organisations in EU MS/AC and Russia, conducted in 2009.
- Russia is actively developing its bilateral and multilateral S&T relations.
- Russia has requested the association to FP7, which would of course contribute enormously to an internationalisation of Russian R&D and intensification of cooperation with the EU and Associated Countries to FP7.
- Other multilateral funding tools provide opportunities for enhanced cooperation: A Pilot Joint Call for R&D and innovation projects shall be implemented in the frame of the ERA.Net RUS project in early 2011. Multilateral tools for cooperation are also COST, ISTC, and EUREKA. A possible cooperation instrument could in future be the EU's Competitiveness & Innovation Framework Programme (CIP).

7.4 Weaknesses

7.4.1 S&T and innovation policy

- Still too few funds are allocated via competitive programmes of the foundations (RFBR, RFH, FASIE).
- RAS receives out of the federal budget substantial block grant funding; it absorbs approximately one third of the public civilian R&D budget. Only a limited share of these block grant funds is allocated by RAS competitively among its institutes. These RAS internal programmes are not always decided in a transparent way.
- The governance reform of the Ministry of Education and Science, which led to the abolishing of its two subordinated agencies, Rosnauka and Rosobrazovanie, is questioned by scientists, as each such reform takes a lot of time and its outcomes are yet unclear at this stage.

[70] OECD, Economic Outlook No. 87, May 2010.

- There is no infrastructure chain from basic science to its application (IPR, etc.), and scientific results remain unused.
- Stimulating users' demand for innovation lacks in Russia. Therefore innovative goods are often not in demand.
- Funding from state agencies is too narrowly focused on funding in a separate discipline, while funding of interdisciplinary research is neglected.
- The differences between basic science funding mechanisms and funding for applied science are not always taken into account by policy makers.
- Due to increased funding new equipment could be purchased. But in Russia equipment is purchased for each laboratory, which is in difference to foreign countries, where equipment is purchased for a whole department. This means a certain waste of resources in Russia.

7.4.2 Regulatory deficiencies

- The Russian public procurement/tendering law No. 94-FZ is too rigid in its rules and not fully suitable for R&D and innovation funding.[71]
- Limitations of the law 94-FZ concern for example the evaluation criteria to be applied. The costs in the tendering procedure are weighted too high and this biases the selection of research teams. Law 94-FZ sets the weight for scientific quality of a proposal and quality of the team usually at maximum 45% of scores and gives a rather high importance to costs. This biases the selection of research groups for funding.
- Another limitation of the procurement law is that one organisation can submit only one proposal per lot (funding line). This restricts applications of bigger research institutions, which dispose of several competing teams in certain research areas.
- The procurement law foresees that only concrete products (e.g. engines, etc.) need to be tendered in FTPs. As a result the state funding programmes set very specific and limiting conditions in its tenders (indicating a specific company-contractor, etc.). E.g. necessary equipment and material need to be purchased on a tender basis. But for scientific work, material and equipment from specific companies are needed. In the end several scientists have bought equipment or material they did not want. More flexibility is needed here.
- A fourth limitation of the law 94-FZ concerns a rather strict and short timing for the implementation of tenders (regarding launch of call, submission, evaluation, and contracting of projects).
- For Federal Targeted Programmes at present only competitive selection procedures according to the procurement law 94-FZ may be applied and no other competitive procedures.
- There are some intransparencies in project selection processes, which occur due to current regulation.
- The Russian budget code is too complex and does not stimulate R&D and innovation investment.[72]

[71] For a discussion of limitations of the public procurement law see an open letter to president Medvedev, published on 21 May 2010 at www.scientific.ru. See especially Annex 3.

[72] See for a discussion of regulatory weaknesses, which hamper the development of the Russian S&T and innovation system, a speech by Anatoly Chubais, CEO of Rusnano: "RUSNANO CEO Speaks Out on Building an Innovation Economy in Russia", published at www.rusnano.com, accessed on 19/03/2010.

7.4.3 Bureaucracy

- In the assessment of results, the form and format of a report often dominates over the content; the key problem is here unfair play.
- Reporting requirements do not meet project implementation cycles. Many scientific groups submit applications to funding programmes for already achieved results, because it is often the case that shortly (1-2 months) after transfer of funds, a full or intermediary report is already required.
- The rules of the game change during the implementation of calls. In one of the competitions of the Ministry of Education and Science, the application rules changed several times, which needed to be tracked by applicants.
- In foreign S&T organizations there often are specialised units which deal with filing applications; there are no such units in Russian organizations and scientists have to abandon their research in order to prepare applications.
- In Russia many funding programmes require a heavy paperload and are too bureaucratic.

7.4.4 Weaknesses related to Federal Targeted Programmes (FTPs)

- While in FTPs funding per project is substantial, the number of projects supported is rather limited. Therefore many groups remain unfunded. This reduces in the longer run the necessary critical mass of scientists in certain scientific fields, which is required to make important scientific advances.
- Another weakness is the limited possibility of businesses to provide their cost-share (through subsidies or grants) for government funding within FTPs.
- In some lots of FTPs, competition is rather limited among scientific groups. In some cases topics are very narrowly formulated and fit only few groups or only one research.

7.4.5 Financial aspects

- The R&D investment in Russia in percentage terms of GDP is in the view of scientists too low; in 2007 this indicator amounted to 1.12% of GDP. Russia is in international comparison lagging significantly behind the top performing countries for this indicator.
- Underfunding of Russian science, especially for basic research, is a relevant problem mentioned by scientists. For scientific work investments are required and only investment may yield return; yet this fact is not always considered by decision makers.
- A more equal distribution of R&D and innovation funding among S&T organizations has been requested by scientists; currently through specific funding programmes or in some cases directly, without competition, large funding resources are allocated to certain R&D institutions.
- Deficiencies with grant funding concern the requirement within several Federal Targeted Programmes for R&D to attract co-funding from business; business is in Russia is not yet ready to fund science.
- Due to the economic crisis, budget cuts of up to 30% and more on planned R&D spending on FTPs but also for RFBR have been applied in 2009 and 2010.
- Foreign investment in Special Economic Zones (SEZs) for Technology Development is weak.
- Some limitations on spending on certain cost categories are imposed by foundations or funding programmes. For example, FASIE can only to a limited extent support travel costs. Or within the programme National Research Universities labour costs cannot be funded, which weakens this programme.

7.4.6 Evaluation & decision making in funding programmes

- In competitive programmes, the key problem is a closed-club nature of many calls: in some cases the winner is pre-defined, even in RFBR calls, although it is mainly a problem of FTPs.
- Intransparencies of decision-making in funding programmes occur. According to scientists, the fact that RFBR does not provide feedback on applications which were not supported is an example of intransparency.
- The expert community for evaluation of R&D projects is very narrow and national evaluators may often be biased.
- In some cases when a specific research area is dominated by a certain scientific school, it is next to impossible to organise competitions in this area.

7.5 Threats

- Policy factors influence S&T and innovation funding. Political tensions with EU, individual member states, NATO, and other international players may have repercussions on the Russian S&T and innovation policy. For example, the military conflict between Russia and Georgia in summer 2008 led to a delay in negotiations on FP7 association with the EU.
- R&D and innovation funding from abroad as a share of Gross Domestic Expenditure on R&D (GERD) has been declining over the past years.
- The economic situation poses another challenge. The current economic crisis has had important repercussions on S&T funding and led to cuts of 30% and more on planned annual R&D spending for certain FTPs and foundations.
- A lack of budgetary funds has led and may further on lead to problems in covering the planned budgets of FTPs.
- The regulatory framework and its application give an ambiguous picture. Although improvements have been made, regulations may also be applied very rigidly.
- The industry structure poses a certain threat. The Russian industry is characterised by large companies and only few SMEs. Private R&D funding is dependent on few large R&D intensive businesses, while innovative SME's are in comparison still few.

7.6 Strengths and Weaknesses of bilateral & multilateral funding programmes

In the interviews and focus group meeting implemented within ERA.Net RUS, it was also tested for Strengths and Weaknesses of bilateral and multilateral R&D funding schemes, which are relevant for Russian scientists. In the following results of this analysis are presented.

7.6.1 Strengths of bilateral & multilateral funding

- In Europe there are many smaller programmes, like COST, which are very useful for small research groups.
- FP7 participation helps develop links to European partners and to internationalise R&D activities. Russian scientists and companies become known and renowned in Europe; an image develops again that real science is ongoing in Russia.
- Accessibility of S&T funding resources in FP7 on the internet and partner search internet portals are quite helpful.

- Coordinated calls between the EU and Russia within FP7 are a good example of cooperation with the EU. And association to FP7 is a promising perspective.
- Foreign funding assured a certain financial sustainability of Russian R&D organizations.
- It is a positive fact that more and more bilateral or multilateral R&D funding programmes relevant for Russia are set up.
- S&T budgets have been substantially increased over recent years. RFBR, which implements a broad range of bilateral R&D cooperation programmes with European partners, also saw its budget for international cooperation increase importantly.
- In general, a lot has been done recently to improve the international R&D funding system in Russia: e.g. joint coordinated calls by RFBR and Helmholtz association, etc.
- Joint bilateral calls are also implemented by the Ministry of Education and Science (e.g. with Germany recently).
- First attempts for bilateral interaction of scientific consortia in the frame of technology platforms have been undertaken.
- Individual grants obtained by Russian scientists from foreign foundations are in many cases easier than bi- and multilateral calls. The greatest benefits of joint projects are the experience of joint R&D work and joint publications.
- Production of samples in Russia is much cheaper than in Europe.

7.6.2 Weaknesses of bilateral & multilateral funding

- FP7 projects are loaded with heavy bureaucratic procedures. Expenses for proposal preparation for FP7 have to be covered by the R&D organisation itself.
- The calculation of salaries in FP7, based on average salaries in the country puts Russia in unfavourable conditions, as official salaries are quite low.
- International programmes set certain quality levels. INTAS was working well, although there were also too many bureaucratic details.
- Russian scientists participate in COST actions and other smaller European funding schemes, but Russia is not taking part as a member in these schemes, which is judged a pity by scientists.
- The selection of proposals to be funded is not always fully transparent in international programmes.
- Bilateral competitions are better than multilateral, due to a smaller volume of procedures to be agreed upon.
- Large network projects with multiple partners are a certain waste of resources (formation of consortia and policy-making around it).
- In programmes where joint research and mutual visits are planned, the procedures of the programmes are the most difficult part.
- In some cases, calls within international programmes were opened, when the call procedure was not fully agreed yet. Procedures were then corrected during the call implementation.
- Funding cycles are not always complementary in international programmes (e.g. for DFG-RFBR programme: funding cycles are in Germany usually 5 years and in Russia 3 years). A certain difference in size of funding and in reporting requirements can be observed.
- In bilateral exchange programmes, where only one-way travel is planned of young Russian scientists abroad (like with DFG), Russian organisations are unwilling to send their best staff. In case of mutual exchanges of PhD students, exchange costs may only be paid by the German partner.
- Russian-French cooperation- CNRS laboratory: for Russian organizations it's important that cooperation happens at a Russian platform. In such cases, national French sources

may be used for support of research work. The main problem is a technical one: how to use funding which was allocated. Every year funding rules are changed in Paris. National legislation in Russia and in France are in many instances incompatible.

- Costs for housing in Moscow are a problem, as housing is very expensive. This prevents expanding of cooperation.
- International multilateral competitions in their assessment and boards should include representatives of Russian business.
- International cooperation has a significant policy aspect. Greater attention should be paid to funding of basic research in international cooperation. In cases of funding of applied research and of technologies which may be commercialised, certain difficulties with IPR and commercial interests may be expected.
- Overall the import duty practice is a problem, as it is difficult to import equipment and materials. E.g. in cooperation programme RFBR-DFG it is foreseen that up to € 20,000 can be spend on equipment and material for Russian teams. This possibility is rarely used in practice, because there are problems with taxing of grants and import duties for equipment.
- RAS has no proper competitions /call programme for international cooperation. A fund for international cooperation within RAS would be good. This fund could work similarly to RFBR: agreements on bilateral cooperation would be filled with funding of R&D projects.

8 Russian funding programmes, relevant for cooperation with EU MS/AC

In principle any foreign (i.e. also EU MS/AC) organisation may participate in Russia's R&D programmes under which (federal, regional, municipal) funding is offered on a competitive basis. In particular, this applies to Russia's nearest equivalent to the EU Framework Programme for RTD, Russia's multi-annual "Federal Targeted R&D Programme" (2007-2012). This principle does not apply (in full) to the competitive funding programmes of Russia's state R&D and innovation foundations, such as the Foundation for Basic Research (RFBR), the Foundation for the Humanities (RFH), the Foundation for Assistance to Small Innovative Enterprises (FASIE). These are public organisations which are funded on an annual basis from the Russian state budget and whose mandate is to support certain segments of Russia's scientific and industrial communities through competitive grants. Their target audiences are in principle limited to scientists, research organisations and small innovative enterprises established in Russia - with the exception of specific international cooperation activities which they may implement. Information on the cooperation activities of RFBR, RFH and FASIE, as the institutions with the most comprehensive and important funding programmes relevant for cooperation with EU MS/AC, can be found in ERA.Net RUS report 3 on bilateral S&T cooperation between Russia and EU MS/AC. However, these foundations' funding programmes do normally not contain provisions which would explicitly forbid foreign entities to participate in projects supported by them; but in such a case they would not be able to be funded by the Russian foundation for their participation.
Since up to now there is a lack of concrete information in EU MS/AC countries on access opportunities to Russian funding programmes it should be noted that the European commission has launched a new project in 2009 targeting Russia which aims to fill this knowledge gap by identifying in particular access opportunities for researchers from EU MS/AC to Russian S&T programmes: ACCESS4EU-Russia (www.access4eu.com).

8.1 Database of Funding Programmes

One of the activities of ERA.Net RUS is to collect information on S&T programmes at EU MS/AC level as well as on the side of the Russian Federation that are relevant for cooperation with each other. The objective is to learn lessons from the implementation of these programmes for the implementation of advanced multilateral funding activities. In another ERA.Net project, the Black Sea ERA.Net, which runs in parallel, the same activity was foreseen, questioning additionally all countries of the Black Sea region. Therefore a joint approach in addressing institutions in these countries was followed and a “Fact Sheet for international S&T Programmes relevant for cooperation between EU MS/AC and countries of the Black Sea region” was developed in order to collect information. By means of this fact sheet, information on Russian Funding Programmes relevant for cooperation with EU MS/AC was collected as well. The information on all collected programmes has been provided in an online database (www.eranet-rus.eu/en/157.php), which is open for additional programmes. The database can be used by programme owners themselves in order to post information on their programmes. The main target group of this database is of course scientists in Russia and EU MS/AC, who are seeking support for developing their bilateral or multilateral R&D cooperation. It is intended to keep the data as updated and comprehensive as possible.

8.2 Federal Targeted Programmes

Regarding the openness of the Russian Federal Targeted programmes to the participation of EU MS/AC in principle a reciprocity principle is being followed. The EU Framework Programme is open for participation to scientists and research organisations from third countries (including Russia).
Russia on the other hand in principle also grants full access to foreign entities to Russian state funds which are allocated competitively on the basis of the Russian law on state procurement.[73] In particular this applies to "European entities" in the context of Russia's research & development programmes, i.e. to scientists and research organisations from the EU member states and the countries associated to FP7 that wish to participate in Russia's Federal Targeted R&D programmes. However, this is valid only to the extent that analogous options exist for Russian entities in the country (or group of countries) of origin of the foreign entity in question. Also it must be kept in mind that other than for specific international commitments, Russian state bodies can normally not make payments outside the territory of the Russian Federation. Therefore, in order for an organisation to be a funded party in a contract with a Russian State body, it must have a Russian bank account, for which in turn it must have a registration in Russia.

8.3 Other Russian Programmes

The three main Russian foundations for competitive R&D and innovation funding allocation, the Russian Foundation for Basic Research (RFBR), the Russian Foundation for Humanities (RFH), and the Foundation for Assistance to Small Innovative Enterprises (FASIE) implement their own specific international funding programmes. Certain Russian research organisations dispose traditionally of funding tools for international S&T cooperation; this concerns foremost the Russian Academy of Sciences.
For detailed descriptions of these programmes, we refer to ERA.Net RUS report 3 on bilateral S&T and innovation cooperation between Russia and EU MS/AC.

Funding programmes for strengthening Russian universities and their research capacities have been established in recent years by the Ministry of Education and Science. These programmes (e.g. National Research University Programme) include certain components for stimulating international cooperation of universities. For descriptions of these programmes, see previous chapters of this report and ERA.Net RUS report 1 on “The Russian S&T system”.

[73] According to the Russian Federal Procurement Law (ФЗ № 94, Федеральный Закон о размещении заказов на поставки товаров, выполнение работ, оказание услуг для государственных и муниципальных нужд, 21.06.2005) any organisation regardless of its legal form, location, or form of capitalisation may participate in a Russian competition (a call for tender).

9 Annex

9.1 Annex: Abbreviations

List of Abbreviations used in ERA.Net RUS reports

Term	English Abbreviation	Abbreviation in national language
7th EU Framework Programme for Research and Technological Development	FP7	
Academy of Finland		AKA
Academy of Sciences of Moldova	ASM	ASM
Archimedes Foundation	Archimedes	Archimedes
Associated Countries to the EU's 7th Framework Programme for Research and Technological Development	AC	
Austrian Federal Ministry of Science and Research		BMWF
Austrian Federal Ministry of Economy, Family and Youth		BMWFJ
Centre for Social Innovation		ZSI
Commonwealth of Independent States	CIS	
Eastern Europe and Central Asia	EECA	
EURO	EUR, €	
European Bank for Reconstruction and Development	EBRD	
European Community/Communities	EC	
European Cooperation in Science and Technology	COST	
European Research Area	ERA	
European Science Foundation	ESF	
European Union	EU	
European Union Member States	MS	
Federal Agency for Management of Special Economic Zones	RusSEZ	RosOEZ
Federal Agency of Education		Rosobrazovanie
Federal Agency of Science and Innovation	FASI	Rosnauka
Federal Service for Intellectual Property, Patents and Trademarks		Rospatent
Federal Service for Supervision of Education and Science		Rosobrnadzor

Federal Space Agency	Roscosmos	Roskosmos
Federal Targeted Programme	FTP	FZP
Foundation for Assistance to Small Innovative Enterprises	FASIE	
French Ministry of European and Foreign Affairs		MAEE
French Ministry of Higher Education and Science		MESR
Full Time Equivalent	FTE	
General Secretariat for Research and Technology, Greek Ministry of Development	GSRT	
German Federal Ministry of Education and Research		BMBF
Gross Domestic Expenditure on R&D	GERD	
Gross Domestic Product	GDP	
Higher Education Institution	HEI	
Hungarian National Office for Research and Technology		NKTH
Information and Communication Technologies	ICT	
Innovation and Technology Centre	ITC	
Intellectual Property Rights	IPR	
International Association for the promotion of co-operation with scientists from the New Independent States of the former Soviet Union (NIS)	INTAS	
International Bureau of the BMBF		DLR
International Centre for Innovations in Science, Technology and Education	ICISTE	
International Science and Technology Center	ISTC	MNTZ
Joint Research Centre, Institute for Prospective Technological Studies	IPTS	
Ministry of Economic Development of the Russian Federation		Mineconomrazvitie
Ministry of Education and Science of the Russian Federation	MES	Minobrnauki, MON
Ministry of Industry and Trade of the Russian Federation		Minpromtorg
Moscow State University	MSU	MGU
National Authority for Scientific Research, Romania		ANCS
National Center for Scientific Research		CNRS
National Priority Project "Education"		PNPO
National System of Innovation	NSI	
Organisation for Economic Co-operation and Development	OECD	
Programme Owner (of an S&T funding programme)	PO	
Public-Private Partnership(s)	PPP	
Research & Development	R&D	

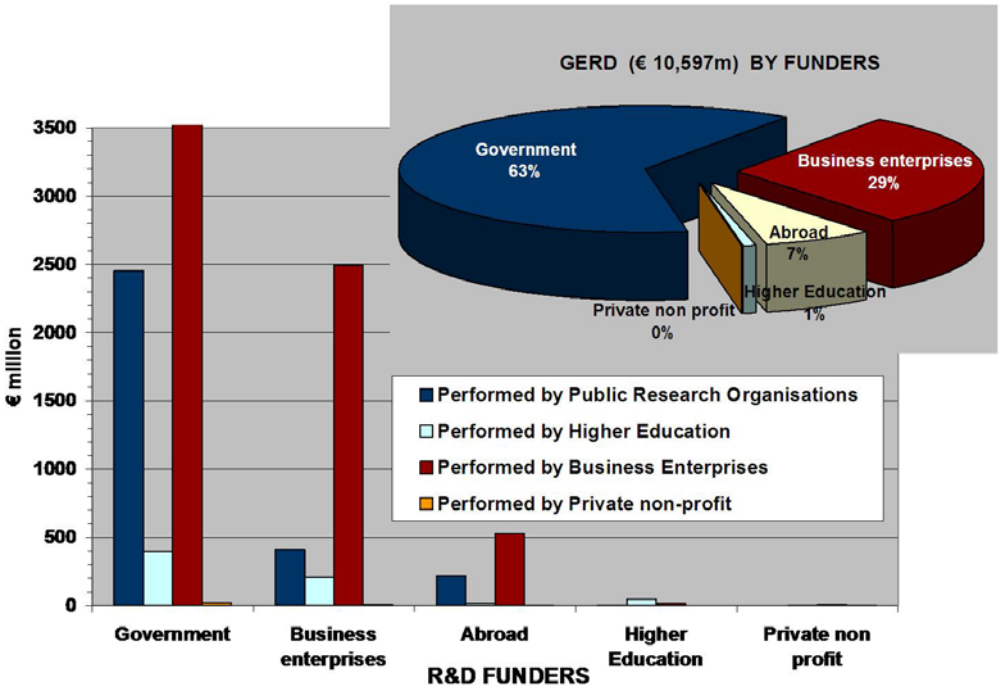
Russian Academy of Agricultural Sciences		RASKHN
Russian Academy of Education		RAO
Russian Academy of Medical Sciences	RAMS	RAMN
Russian Academy of Sciences	RAS	RAN
Russian Academy of Sciences, A.N. Bakh Institute of Biochemistry		INBI
Russian Corporation of Nanotechnologies	Rusnano	Rosnano
Russian Foundation for Basic Research	RFBR	RFFI
Russian Foundation for Humanities	RFH	RGNF
Russian Foundation for Technological Development	RFTD	RFTR
Russian Ministry of Defence		Minoborony
Russian Ministry of Information Technologies and Communication		Minsvyaz
Russian Research Centre "Kurchatov Institute"		KIAE
Russian Rouble(s)	RUB	
Russian Technology Transfer Network	RTTN	
Russian Venture Company	RVC	RVK
Science & Technology	S&T	
Small and Medium-sized Enterprise	SME	
Special Economic Zone	SEZ	OEZ
State Atomic Energy Corporation "Rosatom"		Rosatom
State Corporation "Bank for Development and Foreign Economic Affairs (Vnesheconombank)"		Vnesheconombank, VEB
State Corporation Russian Technologies		Rostechnologii
State Science Center	SSC	
State University - Higher School of Economics	HSE	
Statistical Office of the European Communities	Eurostat	
Technology Transfer Centre	TTC	
The Research Council of Norway	RCN	
The Scientific and Technological Research Council of Turkey		TUBITAK
United Aircraft Corporation	UAC	OAK
U.S. Civilian Research and Development Foundation	CRDF	
Value Added Tax	VAT	

9.2 Annex: List of Critical Technologies

Information and Telecommunications Systems
Technologies for creation of intelligent navigation and management systems
Technologies for transmission, processing and protection of information
Technologies of distributed computing and systems
Software production technologies
Bioinformation technologies
Technologies for creation of electronic components
Industry of Nanosystems and Materials
Nanotechnologies and nanomaterials
Technologies of creation and processing polymers and elastomers
Technologies of creation and processing crystals with special qualities
Technologies of mechatronics and creation of microsystem equipment
Technologies of creation and processing composites and ceramic materials
Technologies of creation of membranes and catalyst systems
Technologies of creation of biocompatible materials
Living Systems
Bioengineering technologies
Cell technologies
Biosensor technologies
Biomedical technologies of human life support and protection
Genome and post-genome technologies for creation of medicines
Biocatalysis and biosynthesis technologies
Rational Nature Utilization
Technologies of monitoring and forecasting the condition of atmosphere and hydrosphere
Technologies of evaluating resources and forecasting the condition of lithosphere and biosphere
Technologies of processing and utilization of technogenic formations and wastes
Technologies of reducing risks and lowering consequences of natural and techogenic catastrophes
Technologies of ecologically safe exploration of layers and mining
Power Engineering and Energy Saving
Technologies of nuclear power generation, nuclear fuel cycle, safe treatment of nuclear wastes and worked out nuclear fuel
Technologies of hydrogen power generation
Technologies of new and renewable sources of power
Technologies of producing energy from organic materials
Technologies of creating energy saving systems of transportation, distribution and consumption of heat and electricity
Transport, aviation and space systems

Technologies of creation of new generations of aerospace and naval
Technologies of creating power efficient engines and propelling agents for transportation systems
Safety and counteracting terrorism
Technologies of counteracting terrorism
Technologies providing protection and living conditions of dangerous objects against terrorism threats
Prospective armaments, military and special equipment
Basic critical military, special and industrial technologies

9.3 Annex: Funding flow diagram 2007[74]



[74] Chart based on data from EUROSTAT, S&T Database

9.4 Annex: SWOT – Interview Guideline

Interview guideline for SWOT analysis of the Russian S&T funding system

ERA.Net RUS is a project funded by the European Communities 7th Framework Programme for Research and Technological Development (FP7). The project shall further and coordinate S&T cooperation between European Union Member States[75], Associated Countries to the FP7 (AC)[76] and Russia.

In the frame of this project an analysis of Strengths and Weaknesses (SWOT) of the Russian S&T funding system is undertaken. SWOT analysis is an analytical method, which is used to identify and categorise significant internal factors (i.e. strengths and weaknesses) and external factors (i.e. opportunities and threats) an organisation faces.
This is an interview guideline for SWOT analysis of Russian S&T funding programme owners. Strengths and Weaknesses shall be tested for the Russian S&T funding system in general and specifically for each Russian S&T funding programme owner.

SWOT interview guideline

Strenghts (internal factors)

What are strengths of the Russian S&T funding system in general?
What are the advantages of your organisation's S&T funding approach?
What is external feedback you receive on your funding activities?
What relevant resources do you have access to?

Weaknesses (internal factors)

What could be improved for the Russian S&T funding system?
What could be improved regarding the S&T funding approach of your organisation?
What should be avoided in the operation of your S&T funding programmes, and in the operation of your organisation?

Opportunities (external factors)

Where do you see good opportunities for the Russian S&T funding system?
Where do you see good external opportunities, which may influence positively the operation of your organisation?
What are national or international trends, you are aware of, which may have a positive impact on your operation?

[75] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom
[76] Albania, Bosnia and Herzegovina, Croatia, FYR of Macedonia, Iceland, Israel, Liechtenstein, Montenegro, Norway, Serbia, Switzerland, Turkey

Threats (external factors)

Which threats do you see for the Russian S&T funding system in general?
What obstacles does your organisation face in its S&T funding policy?
Are any changes of national or international policy threatening your operation or position in the S&T funding system?

Strengths and Weaknesses shall be discussed along the following topical lines:

Changes in government S&T policy

Who is defining the framework conditions for your S&T funding activities?
Which reforms of the S&T sector and S&T funding are upcoming?
Are there new S&T funding programmes planned, which are relevant for your organisation?

Funding programmes

What are your main S&T funding programmes?
Which influence has the legal framework for S&T funding and tax policy on your operation?
How far do you use competitive project funding allocation versus block funding allocation?
What is an average project size you support, and for which average duration?
How many projects do you fund annually?
Which costs do you support with your funding programme?

Evaluation procedures

Which procedures are applied for selection of projects?
Which evaluation criteria?
Who is evaluating proposals?
Who decides on selection of proposals/of funds to be funded?
Evaluation/peer review system – international experts involvement?
How is the implementation of projects reviewed, which are supported by you?

Budget

What is your overall annual budget?
What is your annual budget for R&D funding?
What is your budget for competitive R&D funding programmes?

International cooperation

Which international developments influence your national S&T funding system?
Which forms of international cooperation are used by your organisation?
What are limitations on international cooperation in the Russian S&T funding system?
What are advantages/disadvantages of international cooperation?
What are your main international cooperation partners?

Mobility

Does your organisation support researcher mobility?
Which programmes and which budgets are in place for researcher mobility?
How do you evaluate and select researcher mobility projects?
How many mobility projects have you supported and how many do you support annually?
With which organisations and countries do you cooperate for mobility projects?

9.5 Annex: SWOT – Focus Group Concept

ERA.Net RUS Focus Group Meeting

On

Strengths and Weaknesses of the Russian S&T funding system

and Experience with international S&T funding programmes

The ERA.Net RUS project

ERA.Net RUS is a project funded by the European Communities 7th Framework Programme for Research and Technological Development (FP7). The project shall further and coordinate S&T cooperation between European Union Member States[77], Associated Countries to the FP7 (AC)[78] and Russia. Find detailed information on the ERA.Net RUS project at its website: www.eranet-rus.eu

Logic of the Focus Group Meeting

In the frame of the ERA.Net RUS project a meeting with a small group of Russian scientists shall be conducted to test for their experience with national and international S&T funding programmes.

Participants should have experience with **national Russian S&T funding programmes**: e.g. RFBR, FASIE, Federal Targeted Programmes, etc.

And experience with **international S&T funding programmes**:

e.g. bilateral programmes such as RFBR-Academy of Finland, RFBR-Austrian Science Fund, RFBR-German Research Foundation, etc.; or unilateral programmes such as of the Swiss National Science Foundation, Slovenian Research Agency, etc.; or multilateral programmes such as FP7, INTAS, etc..

Participating scientists should specify before the meeting with which programmes they have experience.

[77] Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom

[78] Albania, Bosnia and Herzegovina, Croatia, FYR of Macedonia, Iceland, Israel, Liechtenstein, Montenegro, Norway, Serbia, Switzerland, Turkey

In the first part of the meeting, **Strengths and Weaknesses (SWOT) of the Russian S&T funding system** shall be discussed.

- What are strengths of the Russian S&T funding system in general? What has improved over recent years?
- What is your perception of basic funding (block funding, non-competitive, without calls/tenders, no peer review) versus competitive funding (tenders, project based, peer review) in Russia?
- What could be improved for the Russian S&T funding system? Which problems do you face, when applying for (competitive) S&T funding in Russia?

The second goal of the focus group meeting is to test for **experiences with bilateral and multilateral S&T cooperation programmes**:

- What is your experience with different international S&T funding programmes (bilateral or multilateral): what worked well, which points need improvement?
- What would you expect from a multilateral medium scale S&T funding programme, such as INTAS was? Which needs and requirements do you see here?

The general questions outlined above shall be discussed for both, national and international funding along the practical aspects of the programmes:

- Budget, financial means distributed through the programme(s).
- Peer review system/evaluation of the programme.
- Responsiveness of funding agency, contact/interaction with funding agency.
- Obstacles met in application procedures and project implementation.

Information gathered in the discussion will be integrated in two analytical reports, which are currently prepared in the frame of the ERA.Net RUS project: one report on "The Russian S&T funding system" and a second report on "State of the art and perspectives of bilateral S&T programmes between EU Member States/Associated Countries to FP7 and Russia.

Practical Information

Planned date of the meeting: 10.00, 25 March, 2010

Duration of the meeting: 2-3 hours

Location of the meeting: Moscow, Russia – Russian Academy of sciences A.N Bakh Institute of Biochemistry

Moderators of the meeting:

Irina Kuklina, International Centre for Innovations in Science, Technology and Education (ICISTE), Moscow, Russia, kuklina@mniop.ru, www.mniop.ru

Manfred Spiesberger, Centre for Social Innovation (ZSI), Vienna, Austria, spiesberger@zsi.at, phone: +43-650-6812122, www.zsi.at

Liliana Proskuryakova, State University – Higher School of Economics (HSE), Moscow, Russia, lproskuryakova@hse.ru, phone: +7- 495-628-3106 , www.hse.ru

Meeting Organiser:

International Centre for Innovations in Science, Technology and Education (ICISTE), Moscow, Russia, Semenova Anna, semenova@mniop.ru,+7(495)6480939
www.foresight-russia.ru

9.6 Annex: FTP Nanoindustry Infrastructure, Implementation Status 2010

Federal Targeted Programme "Development of the nanoindustry infrastructure in Russia for 2008-2010"

Current state of the Programme – extended until 2011

Public Coordinator Ministry of Education and Science of Russian Federation

Programme objectives Provision of special experimental, diagnostic, metrological, scientific-technological and industrial equipment, and of other equipment and devices for the national nanotechnology network, which is to be created on the basis of public organisations. Enabling effective operation and use of experimental infrastructure in the interest of Russian scientific and higher education organisations, working in the area of nanotechnologies and nanomaterials.

Funds available within the Federal Targeted Programme "Development of the nanoindustry infrastructure in Russia for 2008-2010" for upgrading infrastructure

	Total funding (million RUB)	**Including**		
		2008	**2009**	**2010**
Overall funding	27733	10607,5	8809,7	8315,8
including:				
federal budget funding	24944,6	9536,2	7925,4	7483
non-budget funding	2788,4	1071,3	884,3	832,8

Sources of funds

	Total funding (million RUB) **(public + private)**	**Including**		
		2008	**2009**	**2010**
Funding agencies:				
Capital investments	**16925,7** (15245,6 + 1680,1)	**7528,2** (6782,2 + 746)	**5168,4** (4653,4 + 515)	**4229,1** (3810 + 419,1)
Federal Agency for Science and Innovation (Rosnauka)	7487 **(6745 + 742)**	**3559,8** (3207 + 352,8)	**2260** (2036 + 224)	**1667,2** (1502 + 165,2)

	Total funding (million RUB) **(public + private)**	**Including**		
		2008	**2009**	**2010**
Federal Service for Technical and Export Control (FSTEC)	874,2 **(787,6 + 86,6)**	**446,4** (402,2 + 44,2)	**270,2** (243,4 + 26,8)	**157,6** (142 + 15,6)
Federal Agency for Industry (Rosprom)	1166,6 **(1051 + 115,6)**	**411,8** (371 + 40,8)	**456,2** (411 + 45,2)	**298,6** (269 + 29,6)
Roscosmos	777 **(700 + 77)**	**222** (200 + 22)	**277,5** (250 + 27,5)	**277,5** (250 + 27,5)
Rosatom	1097,5 **(986 + 111,5)**	**353** (318 + 35)	**400,4** (358 + 42,4)	**344,1** (310 + 34,1)
Rosobrazovanie	4674,2 **(4211 + 463,2)**	**2180** (1964 + 216)	**1237,7** (1115 + 122,7)	**1256,5** (1132 + 124,5)
Rostechregulation	205,4 **(185 + 20,4)**	**77,7** (70 + 7,7)	**55,5** (50 + 5,5)	**72,2** (65 + 7,2)
Russian Academy of Sciences	643,8 **(580 + 63,8)**	**277,5** (250 + 27,5)	**210,9** (190 + 20,9)	**155,4** (140 + 15,4)
Other activities	**10807,3** (9699 + 1108,3)	**3079,3** (2754 + 325,3)	**3641,3** (3272 + 369,3)	**4086,7** (3673 + 413,7)
Rosnauka	6243,4 **(5589 + 654,4)**	1775,7 **(1579 + 196,7)**	2079,1 **(1862 + 217,1)**	2388,6 **(2148 + 240,6)**
Rosobrazovanie	2834,4 **(2427,5 + 406,9)**	766,6 **(650 + 116,6)**	963,2 **(825 + 138,2)**	1104,6 **(952,5 + 152,1)**
Rostechregulation	1729,5 **(1682,5 + 47)**	537 **(525 + 12)**	599 **(585 + 14)**	593,5 **(572,5 + 21)**

Table. 3 Beneficiaries of the Programme

	Name of the beneficiary	Funding by means of the Federal budget (million RUB)			
		2008 - 2010 Total	2008	2009	2010
1.	Russian Research Center "Kurchatov Institute ", Moscow	5297	2600	1600	1097

	Name of the beneficiary	Funding by means of the Federal budget (million RUB)			
		2008 - 2010 Total	2008	2009	2010
2.	Central Research Institute of Construction Materials "Prometey", St. Petersburg	1286	550	380	356
3.	Institute of technology of superfirm and new carbon materials, Troitsk, Moscow Region	162	57	56	49
4.	Central Research Institute of Chemistry and Mechanics, Moscow	787,6	402,2	243,4	142
5.	Lukin Research Institute of Physical Problems, Moscow	949	332	377	240
6.	All-Russian Research Institute of Aviation Materials, Moscow	102	39	34	29
7.	Keldysh Research Institute, Moscow	700	200	250	250
8.	Bochvar All-Russian Research Institute of Inorganic Materials, Moscow	986	318	358	310
9.	Moscow State Institute of Electronic Equipment (technical university), Moscow	410	410	-	-
10.	Far-Eastern State University, Vladivostok	129,5	129,5	-	-
11.	Korolev Samara State Aerospace University, Samara	129,5	129,5	-	-
12.	Plekhanov St. Petersburg Mining Institute (technical university), St. Petersburg	129,5	129,5	-	-
13.	Tomsk State University of Control Systems, Tomsk	129,5	129,5	-	-
14.	Tomsk Polytechnical University, Tomsk	129,5	129,5	-	-

	Name of the beneficiary	Funding by means of the Federal budget (million RUB)			
		2008 - 2010 Total	2008	2009	2010
15.	Novosibirsk State University, Novosibirsk	129,5	129,5	-	-
16.	Moscow Engineering-Physical Institute (technical university), Moscow	129,5	129,5	-	-
17.	St. Petersburg State Polytechnical University, St.Petersburg	129,5	129,5	-	-
18.	Moscow Power Engineering Institute (technical university), Moscow	129,5	129,5	-	-
19.	St. Petersburg State Electrotechnical University (LETI), St. Petersburg	129,5	129,5	-	-
20.	St. Petersburg State Institute of Precise Mechanics and Optics, St. Petersburg	129,5	129,5	-	-
21.	Belgorod State University, Belgorod	129,5	129,5	-	-
22.	Peoples' Friendship University of Russia, Moscow	111,5	-	111,5	-
23.	Gorky Ural State University, Ekaterinburg	111,5	-	111,5	-
24.	Saratov State University, Saratov	111,5	-	111,5	-
25.	Vladimir State University, Vladimir	111,5	-	111,5	-
26.	Moscow State Building University, Moscow	111,5	-	111,5	-
27.	Kuibyshev Far-Eastern State Technical University,Vladivistok	111,5	-	111,5	-
28.	Novosibirsk State Technical University, Novosibirsk	111,5	-	111,5	-

	Name of the beneficiary	Funding by means of the Federal budget (million RUB)			
		2008 - 2010 Total	2008	2009	2010
29.	Southern-Ural State University, Cheljabinsk	111,5	-	111,5	-
30.	Perm Technical University, Perm	111,5	-	111,5	-
31.	Tupolev Kazan State Technical University, Kazan	111,5	-	111,5	-
32.	Ufa State Aviation Technical University, Ufa	125,8	-	-	125,8
33.	Tjumen State University, Tjumen	125,8	-	-	125,8
34.	Ural State Technical University, Ekaterinburg	125,8	-	-	125,8
35.	Ammosov Jakustk State University, Jakutsk	125,8	-	-	125,8
36.	Vjatsky State University, Kirov	125,8	-	-	125,8
37.	Immanuil Kant Russian State University, Kaliningrad	125,8	-	-	125,8
38.	Moscow Pedagogical State University, Moscow	125,8	-	-	125,8
39.	Gubkin Russian State University of Oil and Gas, Moscow	125,7	-	-	125,7
40.	Derzhavin Tambov State University, Tambov	125,7	-	-	125,7
41.	All-Russia Scientific and Research Institute of Optico-Physical Measurements, Moscow	185	70	50	65
42.	Baykov Institute of Metallurgy and Material Studies of RAS, Moscow	595	265	190	140
	Total in Programme	15245,6	6782,2	4653,4	3810