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**Russian Economy in 2010. Trends and Outlooks.**  
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**The review provides a detailed analysis of main trends in Russia's economy in 2010. The paper contains 6 big sections that highlight single aspects of Russia's economic development: the socio-political context; the monetary and credit spheres; financial sphere; the real sector; social sphere; institutional challenges. The paper employs a huge mass of statistical data that forms the basis of original computation and numerous charts**

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## The State of the Research and Innovation Sphere in Russia in 2010

Last year, the subject of innovation development formed one of the top public policy priorities. That manifested itself in the rise of new initiatives on support of university research, development of interaction between science and business, and encouragement of the latter's innovation activities. The focus shifted onto huge projects, with Skolkovo being atop the list. But from the perspective of earmarked resources, there also are other large-scale measures: a project on engaging leading researchers in forming new laboratories at Russian universities and an initiative on establishment of state-sponsored cooperation between universities and industrial corporations on hi-tech production projects.

### The State of the Research

Despite the government increasingly centering on innovation development, there were no notable changes in the research sphere. Reform of the public research sector has not kicked off, the general ageing of the cadres was still under way, while a more vigorous support of university research has so far failed to yield visible results, because the processes of its transformation have been nascent.

The state budget remained a major source of funding of research, but the share of businesses in the support of R&D rose slightly. The specific weight of spending on fundamental research was on the upsurge, which can be ascribed to growth in budget appropriations on respective activities by leading universities and research centers.

Overall, within next three years the public spending on science should be substantially lower than public expenditures on innovation development<sup>1</sup>. (*Table 16*).

*Table 16*

### Funding of Main Socio-Economic Policy Priorities, as % of GDP

Priority	Estimated		
	2011	2012	2013
INNOVATION DEVELOPMENT	0.9–1.1	0.9–1.1	0.9–1.0
including:			
Development of fundamental and applied research	0.2–0.4	0.2–0.3	0.2

*Source:* Consolidated background reference paper to bill № 433091-5 «On the 2011 federal budget and the planned period of 2012 and 2013 ». p.5.

<sup>1</sup> According to the RF Ministry of Economic Development's definition, **public spending** on innovation development is formed by types of expenditures that help develop (create, introduce) new products, services, technologies, form competencies in priority spheres of economic development, advancement of the knowledge-based economy. Innovation expenditures comprise both direct expenditures on support of innovations and those exerting an indirect influence through private demand, intensification of motivation, and other factors. (Source: Strategiya innovatsionnogo razvitiya Rossiyskoy Federatsii na period do 2020 goda. Proekt. M.: MER, 2010. Wording of 31.12.2010.

In 2011, the budget spending on fundamental research should increase by 9% and the one on applied research - by 50%, with a 32% overall increase in budget appropriations compared with the 2010 figures. So, the government's sharp turn towards applied research is evident, and, from the perspective of the task to encourage innovation development in the longer run, this trend may prove an ambiguous one.

The tender-based funding of research, including projects run in tandem with businesses, forms an officially announced government priority. However, it has been consistently shrinking over the past three years. More specifically, the volume of budget allocations on implementation of federal target programs slid from Rb. 903.8 bln. in 2009 to 730.9 bln. in 2010<sup>1</sup>. Tender mechanisms and procedures became target for the academic community's criticism, because of their opacity and problems with application of Federal Act № 94-FZ<sup>2</sup>, in compliance with which it is the bid price, rather than the applicant's qualifications and quality of the project, that forms a main projects assessment criterion.

The other kind of tender-based funding is formed by grants awarded by public research foundations. It de facto appears stagnant, as originally cash-strapped, such foundations see their public funding contract. In 2011, their budget should increase by meager 5.7%, while it should have increased at the same rate as the overall appropriations on civil research - that is, by 32%. According to the budget plan for 2011-2013, the Russian Foundation for Fundamental Research should receive Rb. 6.0, 4.3 and 4.3 bln., respectively. For reference: MSU and SPSU should receive far greater volumes of funds on research: MSU – Rb. 10.6 bln. in 2011, 10.7 bln. in 2012 and 9.9 bln. in 2013, while SPSU – 5.4 bln., 8 bln. and 8 bln, respectively<sup>3</sup>.

Notwithstanding the above challenges, the financial standing of the research sector has lately relatively stabilized. This, however, is not true, as far as the state of research cadres is concerned. They have constantly decayed. The outflow of the cadres engaged in R&D activities was on the upsurge, while all their structural indicators were aggravating. More specifically, the researchers' average age was on the rise, as was the bust bay of the middle-aged (35-55 years) researchers; the young practice a "quick call" on science, while auxiliary and technical personnel are washed away at a rate greater than researchers'.

A critical aspect of the research complex's functioning also is the state of its material and equipment base. A poor material provision of research affects the state of its human capacity and effectiveness of research activities. Quantitative characteristics of the material base of research in value equivalent collected by the official statistics fail to provide an adequate idea of its state, so much for problems associated with renewal of the equipment stock and its use by research organizations and universities.

The year of 2010 saw completion of the inventory check of unique scientific equipment placed with research organizations and universities of the public sector for science. The data collected across nearly 400 objects of the research infrastructure allow a series of qualitative conclusions. The main finding is that the material base of research is basically obsolete; a radical renewal of equipment takes place chiefly at individual universities, while the average

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<sup>1</sup> Berdaskevich A.P., Safaraliev S.G. Ob effektivnosti byudzhetykh investitsiy v rossiyskuyu nauku/Innovatsii. 2010. №1. p.33.

<sup>2</sup> Federal Act of 21 July 2005 № 94-FZ "On placing orders on supplies of goods.

<sup>3</sup> Gorbatova A. Zashli v tupik?//Nauka i technologii Rossii. 21 October 2010. - URL: [http://strf.ru/material.aspx?CatalogId=221&d\\_no=34423](http://strf.ru/material.aspx?CatalogId=221&d_no=34423) Date of access: 07.02.2011.

equipment effectiveness rate is fairly low. Meanwhile, academic institutions tend to use equipment more efficiently than universities and other scientific organizations.

Academic research organizations have on average more outdated equipment than universities, particularly with account of unique equipment renewal rates. Starting from 2007, academic institutions saw placement in operation of 26% of research equipment of the overall number of machines a given organization has vis-à-vis the universities' 37%. In leading universities, unique equipment is located chiefly at research institutes under universities, which have a relatively autonomous status (this situation is characteristic of MSU, SPSU, Tomsk polytechnic university, the Southern federal university). That said, academic organizations have recently been more active than universities in modernizing of their unique equipment.

The equipment load rate was higher at academic institutions than at universities, which can be explained by the former's more intense research activities vis-à-vis the universities'. At academic institutions, 40% of equipment is loaded at 91-100% relative to the nameplate full load, while the universities' respective rate is 15%. Meanwhile, as much as 20% of unique equipment placed with academic institutions and 31% of unique equipment at universities is loaded at 50% and less (vs. the nameplate full load).

It is academic institutions and universities that remained major outsider users of unique equipment (accounting in total for 54% of all users). Meanwhile, the proportion of small-sized start-ups in the total number of users of unique equipment accounts for just 11%, which proves loose relations between science and business.

It is academic institutions that boast the highest average and absolute unique equipment effectiveness rates measured by the number of publications, conference presentations, patenting and licensing. However, the aggregate indicators are low. Thus, research findings resulted in granting licenses only at 0.05% of examined objects, while findings obtained using less than a half of the overall equipment stock were protected with patents.

In all, the research sector's performance mirrors its state and ongoing processes therein. Accordingly, Russia's specific weight in the global flow of publications registered in Scopus database plunged from 2.22% in 2005 to 1.8% in 2009. By the level of citation rate Russia ranks 16<sup>th</sup> worldwide. When compared with the BRIC nations, Russia outpaces only Brazil (the 20<sup>th</sup> place worldwide), while trailing behind India (the 16<sup>th</sup> one) and hopelessly falling behind China (the 7<sup>th</sup> place). Russia's publication policy, especially in the regions, is very poor. By contrast, facing a profound challenge of mastering the English language, Chinese researchers nonetheless literally bombard journals with their articles, thus bolstering changes for their publication. By contrast, Russian researchers often do not even dare try to prepare an article for a foreign journal. Plus, there is no training on the art of drafting a research paper in Russia, albeit there are strict rules in this regard.

To bolster the scientific sector, in 2010 the government promoted three main directions: (1) assistance with furthering interaction with the Russian-language research expat community; (2) development of an organizational reform mechanism for the public research sector; (3) support of university research and its promotion of its cooperation with business community.

## Measures on Promotion of Interaction with Representatives of the Expat Community

### *Support of research spearheaded by the Russian expat community*

The project “Conduct of research by teams headed by visiting researchers” is implemented in the frame of the Federal target program (FTP) “Scientific and scientific-pedagogical human resources of the innovation Russia” for 2009- 2013 (hereinafter referred to as Measure 1.5 (as enumerated in the list of measures under GTP). The federal budget funding is granted to research projects spearheaded by expat researchers, with a maximum volume of support of a 2- year long project making up no more than Rb. 2 mln. a year. During the project implementation period, the expat researcher’s physical contribution in research activities in Russia’s territory should make up no less than two months a year.

The first competition was held in 2009 and resulted in funding of 110 projects. The second competition was run in 2010 and by its results funding was made available for 125 projects. The intensity of the competition proved fairly even – 3.4 applications per project in 2009 and 3.2 ones- in 2010<sup>1</sup>. The selection resulted in 60% -plus of the winning entries being carried out at universities.

The competition was run on the basis of provisions stipulated in the law on public procurements, which is why the core selection criteria were price and project implementation timelines. As a result, instead of the ultimate Rb. 4 mln., the average value of a contract (for 2 years) was Rb. 3.0 mln. in 2009 and 2.6 mln. in 2010. These are fairly moderate figures of reduction in the contract value when compared with other FTP’s measures. The requirement to have an expat project leader to some extent proved a quality criterion, and it partly cut off brazenly low-balling organizations.

Generalized data on expat project leaders failed to produce a clear understanding of whom research organizations had managed to sign up. Country-wise, the expat pattern proved insignificantly different from data of other competitions (including the geographic pattern of joint publications). In 2009, as much as 64% of researchers came from the US, Germany and France, while in 2010 the proportion of these countries was 57%. As much as 52% of project leaders hold a second (Russian) passport<sup>2</sup>, thus facing no problems with obtaining Russian entry visa. Expat researchers basically tend to hold fairly prestigious positions- 49.6% of participants in Measure 1.5 are professors, 19.2% - heads of departments, chairs and laboratories, and 24% - research fellows; however, the visiting researchers’ scientific profile remained practically unknown. No citation index data was collected. There exists only information<sup>3</sup> on expat project leaders’ publications in journals with the impact factor<sup>4</sup>, which showed that 89.6% of them have such publications. As for the other performance indicator- that is, patenting, it

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<sup>1</sup> Here and below the source of qualitative data on measure 1. 5 is the national foundation for cadres training, which is the operator of this program Measure.

<sup>2</sup> Only the 2009 data.

<sup>3</sup> The data was collected only in 2010.

<sup>4</sup> The impact factor, often abbreviated IF, is a measure reflecting the average number of citations to articles published in science and social science journals. It is frequently used as a proxy for the relative importance of a journal within its field, with journals with higher impact factors deemed to be more important than those with lower ones. Accordingly, a publication in the journal with a higher impact factor is considered to be more prestigious, as it gives a broad audience an opportunity to know the author’s paper.

proved to be pretty low, with 67% of the total number of visiting researchers not ever authoring a patent.

So, the data collected with regard to Measure 1.5 failed to give a comprehensive answer to the question as to whom Russian research organizations have managed to sign up. Meanwhile, as objectives of Measure 1.5 were formulated fairly murky right from the beginning, there is no answer to the question as to whom specifically, and for what purpose, they would like to sign up. The Measure is currently losing its momentum – at least, the plans for 2011 no longer feature it. It has been replaced by a far more ambitious project on attraction the most renowned researchers.

### *Creation of new university laboratories led by prominent researchers*

Measures on attraction of leading researchers into Russian institutions of higher professional education were approved in 2010 by a special Government Resolution (of 09 April 2010, № 220). The ultimate objective of creation of research laboratories run by the best researchers from overseas is most likely to shape competition environment, boost the quality of research and the university research on the whole. Theoretically, this might give an extra fillip to the best academics' migration to universities.

If successful, universities are entitled to Rb. 12 bln. in subsidies in 2010-2012. The plans comprise establishment of 80 laboratories, each entitled to up to Rb. 150 mln. (some USD 5mln.) in subsidies for three years – the amount unprecedented even by developed nations' standards. The funds can be spent on purchases of new equipment, reagents, and other needs. The only restriction is that labor compensations payable to the team and its leader may not exceed 60% of the grant's amount. The most substantial condition is that the competition is open for the best researchers, regardless of their residence or job location, which means these can be both domestic researchers, expats, and foreign scientists alike. Their expertise is assessed by past achievements, including such formal indicators as the h-index<sup>1</sup>. Meanwhile, under the terms of the competition, a leading researcher is bound to work in the newly created laboratory for no less than 4 months a year starting from 2011.

The competition in question displayed a number of problematic aspects that had been evident yet prior to its start, which is why they appear particularly perilous from the perspective of the possibility to ensure an adequate return on the budget investments.

The main problems associated with the ideology of the competition are as follows:

1. Building a world-class laboratory is a daunting challenge, given a poor general university infrastructure (from the perspective of efficiency of equipment use, problems with human resources, including the shortage of auxiliary and other staff).

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<sup>1</sup> The h-index is an index that attempts to measure both the productivity and impact of the published work of a scientist or scholar. The index is based on the set of the scientist's most cited papers and the number of citations that they have received in other people's publications. The index can also be applied to the productivity and impact of a group of scientists, such as a department or university or country. The index was suggested by Jorge E. Hirsch, a physicist at UCSD, as a tool for determining researchers' relative quality and is sometimes called the Hirsch index or Hirsch number. The index displays a proper accuracy only under comparison of researchers of the same field of science, as citation traditions differ across different branches of science. Like other bibliometric characteristics, the h-index is not strictly correlated with the researcher's profile and performance, because of string of parameters that bias its value, including for example time that has elapsed from the moment the article was published (this is why young authors cannot enjoy a very high h-index).

2. The requirement to be present *in personae* at the university laboratory for no less than 4 months a year precluded a substantial number of leading foreign researchers from bidding, for they are not in a position to spare so much time on their work in Russia. The condition in question de facto constitutes a “pendulum migration” option, which back in the 1990s had been the way Russian researchers sought to increase their material level. This approach does not appear efficient enough from the perspective of attraction “crème of the crème”, and to some extent it is less appealing than the other two options – namely, a long-term contract implying a complete relocation to Russia for the lifetime of a respective contract or a flexible schedule of visits to the country coordinated with a university head, with no compulsory timeframe. That is why the best option might become creation of laboratories with “Western participation”, rather than establishment of the ones run by a visiting researcher.
3. Requirements to research outputs seem overly lax when compared with an extensive and fairly strict set of project and staff selection criteria and planned sizeable financial infusions in creation of laboratories (the researcher is required to publish at least one article or obtain at least one patent upon 18 months of his work). Meeting these requirements is no sweat working anywhere, too. For reference: in the US, researchers of national laboratories are bound to publish annually no less than three articles in peer-reviewed journals.
4. Uncertainty of prospects and a short time horizon of the budget support: the government has no plans (or they have not been made public) with regard to a further support of laboratories upon expiration of the three-year grant. Meanwhile, the term of financing effectively is two year (the year of 2010 cannot be considered a full-fledged year of funding, as the competition results were reckoned up only on 29 October 2010), which is not enough for launching and fine-tuning a research laboratory’s efficient operations. Worldwide, the respective timeline is in the region of 5 years (eg the “standard” practiced by the National Institutes of Health in the US).

Huge funding proved very attractive to prospective applicants – shortly after the RF Ministry of Education and Science voiced the intent to award 80 grants, the competition level became 6 applications per grant, i.e. twice as many “average nationwide” Russian foundations’ grant competitions and ministries’ tenders. However, having assessed the applications, the decision was made to award only 40 grants and to hold another competition in early 2011<sup>1</sup>.

Researchers from overseas were more responsive to the call for competition than Russian-speaking expats – 35%<sup>2</sup> and 22% of the total number of applications, respectively (*Table 17*), with Russian researchers clearly dominating the list of applicants (43% of applications in total). The structure of grant recipients, however, proved to be nearly an opposite one, as the competition winners chiefly became projects spearheaded by expat community representatives (52.5% of all the awarded grants). The proportion of overseas researchers that did not belong into the expat community in the overall number of grants remained unchanged, while the number of Russian permanent residents amid victors was a meager 12.5% (5 people).

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<sup>1</sup> Minobrnauki provedet vtoroy otkrytyi konkurs dlya uchenykh na polycheniye grantov dlya nauchnykh issledovaniy//29.10.2010 г. - URL: <http://www.rbc.ru/rbcfreeneews/20101029212303.shtml>. Date of access: 07.02.2011.

<sup>2</sup> Including 2% of researchers from across the CIS.



Table 17

**Distribution of Megagrant Applications and Awarded Grants  
due to the Project Leader's Residence**

The project leader's residence	Applications, as % to their total number (N = 507)	Grants, s % to their total number (N = 40)
Russian researcher	43	12.5
Foreign researcher	35	35
Foreign researcher- the Russian expat community representative	22	52.5

*Source:* calculated on the basis of data of the RF Ministry of Education and Science. <http://mon.gov.ru/press/news/7876/>

Speciality-wise, the pattern of victorious projects appears fairly balanced and mirrors both the current balance of forces across areas of research (with projects in the field of physics, mathematics and mechanics being traditionally strong) and the government's new priorities (an unusually great number of grants on biology, biotechnologies, medicine –11 grants combined of 40 ones). Such fields as astronomy, nuclear power and technologies, machine science, chemistry, energy production and conservation, as well as the direction of “economics, international studies and sociology”, were awarded one grant each.

University-wise, the grant pattern shows that alongside a relatively big number of grants allocated to several leading universities, the competition organizers also supported a string of projects on creation of laboratories at regional universities that do not hold such status, such as Puschino State University, Udmurt State University, Bashkir State university. The group of leading universities comprised nine universities, each enjoying a certain status (an especially valuable object; research or federal university): MSU, SPSU, MFTU, NRU-HSE, Sibir Federal University, Novosibirsk State University, Nizhegorodsky State University, LITMO, and Tomsk Polytechnic University.

After the competition results were made public, the research community found themselves engaged in a heated debate on to what extent the choice was fair. The evaluation process was arranged well - for the first time ever some 2/3 of experts engaged in the primary assessment of projects was represented by researchers from overseas<sup>1</sup>. The evaluation stage resulted in picking 114 finalist projects, of which it was supposed to select 80 winners. That the Council for Grants under the RF Government, which has the final say on the matter, singled out only 40 winners and did not care to publicly substantiate the move sparked the most acid comments. In a situation when 13 applications rival for a grant (the actual level of the competition), indeed, the choice no longer can be made solely on the basis of assessment results –it already becomes political and in favor of projects that will be led by expat community representatives.

***Legislative Changes Aimed at Attraction of Highly Qualified Specialists into Russia***

Grant programs aside, the Government undertook other measures aimed at promotion of interaction with the expat community. More specifically, the Government introduced measures to facilitate foreign specialists' employment conditions in Russia.

The legal ground of the move became Federal Act of 19 May 2010 № 86-FZ “On introducing amendments to the Federal Act “On legal status of foreign citizens in Russian Federation promulgated on July 1 2010. The Act reads that work permits are now granted to foreign citi-

<sup>1</sup> According to the RF Ministry of Education and Science, there were 600 foreign experts out of the total of 1,000 experts engaged in the evaluation process.

zens who are highly qualified specialists for the term of up to 3 years, with a possibility of their repetitious extension. The said foreign citizens shall also be granted the RF resident tax regime, with their personal income tax rate being 13% (regardless of length of their stay in Russia). Meanwhile, the highly qualified specialist is construed by the law as a foreign citizen who has a professional background, operational skills or achievements in a given field of activity, should conditions of his attraction to labor activity in RF provide for his receiving a salary (labor compensation) in an amount of Rb. 2 mln. more over the period not exceeding one year. No doubt the new Act will be instrumental in the first place to those foreign citizens who will be awarded grants for creation of laboratories with universities, as well as to those who are planned to be attracted for contribution to the Skolkovo project. However, like a number of recently promulgated legislative acts, this one does not appear fully consistent with the already effective law and Codes in particular, either. Furthermore, it comprises equivocal formulations that engender legal collisions. Problems of this kind have already arisen, with the most obvious of them being the following ones:

1. The amount of salary forms the only imperative criterion of identification of the invited specialist's qualification. In a number of other countries that likewise regulate attraction of qualified human resources, their national legislation emphasizes imperativeness of the presence of at least yet another criterion – namely, the period of service in the speciality, or a diploma on the speciality by whose profile the specialist is hired. Introduction of qualificatory characteristics of a highly qualified specialist increases prestige of a given category and forms a “filter” on the way of hiring those who in reality are not qualified employees.
2. The preferential employment and visa regimes do not concern highly-qualified specialists' family members of an able-bodied age. Russia cannot boast a great variety of kinds of visas, which is why employers of highly qualified specialists have to journey through all circles of bureaucratic hell in an attempt to obtain a visa and employment permit for a foreign citizen who is the highly qualified specialist's family member.
3. The 2m ruble-worth labor compensation is not linked to the calendar year, which might provoke an employer to abuse the contract (an early termination of the contract without paying the amount due in total). The monthly labor compensation would form a more efficient criterion than the “period not in excess of one year”.
4. The preferential tax regulation with respect to highly qualified specialists does appear vain in the event they are classified as non-residents, for tax treaties read they are bound to pay back taxes in the country of residence, notwithstanding their tax contributions in Russia. So, for a prospective specialist the tax benefit is not that important, and it per se results in the migration of funds from the RF budget to foreign countries' ones.

The above list is not exhaustive, as there exist a whole string of local and detailed challenges facing both employers and employees eager to benefit from the status of highly qualified specialist.

The government reacted to the challenges with a laudable speed by promulgating already on 23 December 2010 Federal Act №385-FZ “On introducing amendments to individual legislative acts of the Russian Federation”. The Act is aimed at remedying a number of the above problems.

First, the Act introduced the variative definition of the concept of highly qualified specialist, which is now recognized as a foreign citizen with a professional background, skills or achieve-

ments in a specific field of activity, should conditions of his attraction to labor activity in Russian Federation provide for his receiving a salary (labor compensation):

- 1) In an amount of no less than one million rubles a year on the basis of one year (365 calendar days) payable to highly qualified specialists who are researchers or faculty members in the event they are invited to carry out research or tuition activities by publicly accredited higher educational institutions, state academies of sciences or their regional subsidiaries, national research centers or public research centers;
- 2) Without regard to the amount of a salary – to foreign citizens participating in implementation of Skolkovo project, per the Federal Act “On innovation center “Skolkovo”;
- 3) In an amount of no less than two million rubles on the basis of one year (365 calendar days) – to other foreign citizens.

So, the Act classified Skolkovo and the research sphere into separate categories, which, fundamentally, is correct.

Second, the Federal Act establishes a more liberal and simpler procedure of issuance and a subsequent extension of working visas for the highly qualified specialist’s family members.

In all likelihood, such a prompt fine-tuning of the normative and legal regulation can be explained by the government’s keenness to complete the model projects – that is, the innovation town of Skolkovo and the megagrant program designated for inviting world’s leading researchers to Russia.

#### Plans on Reforming the Public Scientific Sector

The principles and methodologies of the organizational reforming of scientific organizations under the federal agencies of executive power and state academies of science have been developed since 2008. In April 2009, the RF Government issued its Resolution of 08 April 2009 № 312 “On assessment of performance of research organizations conducting civic research, pilot-plans and technological works”. In compliance with the Resolution, the assessment should result in optimization of the research organizations network with a subsequent reallocation of volumes of budget appropriations for R&D for departmental research institutions.

Upon an inventory check, all such organizations should be classified into three categories: leaders, stable organizations, and institutions that have lost their research profile and development prospects. After that, there should be designed plans on solidification of leading positions of organizations of the 1<sup>st</sup> category, building of institutional development programs for organizations of the 2<sup>nd</sup> category, and design of proposals on reorganization or liquidation, and – in individual cases - on replacement of their heads – for organizations of the 3<sup>rd</sup> category.

Despite the standardized methodology approved by the RF Ministry of Education and Science, principal budget funds managers (ministries and the RAS) had the right to modify the standardized version of assessment criteria with account of the departmental organizations’ profile. As a result, through 2010 agencies have been designing their own performance assessment methodologies<sup>1</sup>, and the inventory check should kick off only in 2011. According to the RF Government’s plans, conduct of a comprehensive research audit on public organizations

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<sup>1</sup> Thus, the RF Ministry of Education and Science approved the standardized methodology with Executive Order of 14.10.2009 № 406, while, for example, Rosobrnadzor approved its own methodology with Executive Order of 25.06. 2010 №1756, and the RF Ministry of Health Care and Social Development did that with Executive Order of 26.08. 2010 № 738n.

should be implemented no later than in 2012<sup>1</sup>. It was only institutions under Rosatom that were able to avoid the comprehensive inventory check, as from the perspective of its legal status, Rosatom is an incorporated entity, rather than a public agency, and as such, it defended the right to deal with subordinated institutions on its own.

In all likelihood, the conduct of the above audit would procrastinate the reform process in a given sector, for, as proved by the past record, no post-Soviet interdepartmental reform attempts have ever yielded serious positive consequences.

Methodologies designed by different agencies practically replicate the standardized one and, accordingly, bear the legacy of all its problem criteria and indicators. Thus, a great attention is paid to the performance assessment on the basis of citation indexes and impact factors. Meanwhile, it is suggested to employ both the Russian Research Citation Index (RRCI), which is still under development and object of harsh criticism, and the Web of Science database. The excessive pursuit of citation indices is dangerous, as their main mission is to assess ongoing changes across various directions of research on the basis of mapping the science's development trends, rather than to evaluate research teams and institutions' performance. While assessing smaller objects, such as institutions, along a short time interval (according to the aforementioned Resolution, reports should cover the preceding five years), there appear numerous biases. An article is cited not only because it is important and instrumental, but because a certain theory or direction of research might have grown fashionable at the moment. There also exist such problems as self-citation, negative citation, citing colleagues and seniors. There exist statistical methods that allow cleaning databases from such "inaccuracies", but it is highly unlikely there will be anyone in each reporting institution to take care of that. The methodology also features a clear predominance of quantitative indicators (machinery and equipment in value equivalent, the number of established start-ups, the number and proportion of researchers).

The issue of reform has garnered attention particularly because of a long-standing conflict between the RF Ministry of Education and Science and RAS. Meanwhile, the critical outcome of the exercise should become reform of the survived (albeit rapidly shrinking in terms of the number of both institutions and researchers) departmental science. Public departmental research institutions, including the MIC ones, employ 2/3 of all the domestic researchers.

### Businesses' Innovation Activity

According to Goskomstat, over the past 6–7 years the group of innovatively active corporations comprised 9–11% of industrial corporations included in a sample of research into the state of innovation activities. According to the 2009 data of the Center for science research and statistics, the proportion of the said corporations declined to 7.7%. Meanwhile, against this background, their spending on innovation activities, including the proportion of R&D expenses, rose slightly (*Table 18*).

*Table 18*

### **Main Indicators of Innovation Activities by Organizations of the Industrial Sector and the Services Sphere**

Year	The number of innova-	Spending on technologi-	Of which, as % to the aggregate volume of costs:
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<sup>1</sup> Porjekt strategii innovatsionnogo razvitiya RF na period do 2020 g. materials of the RF ministry of Economic Development. Section VI "Efficient science" (September 2010).

	tively active organiza- tions	cal innovations, as Rb. mln	On R&D	On purchases of equipment and machinery
2006	2830	211392.7	17.8	55.4
2007	2828	234057.7	16.5	58.5
2008	2908	307186.9	14.1	59.0
2009	n/a	399122.0	24.9	51.0

*Sources:* Nauka Rossii v tsifrakh: 2009. Statistichesky sbornik. M.: TSISN, 2009, Table. 8.1; Nauka Rossii v tsifrakh: 2010. Statistichesky sbornik. M.: TSISN, 2010, Table 8.1 (in press).

At the same time, various surveys on innovation activity in the industrial sector post far more optimistic figures, including corporate spending on R&D.

More specifically, a May 2010 survey on 100 large Russian corporations<sup>1</sup> showed that a half of them spend on R&D between 3 and 10% of earnings, while another one-third – less than 3% of earnings. At the same time, there were 4 times as many private innovatively active companies as public ones. For reference: according to OECD data, the large companies' average volume of spending on R&D accounts for 5% of earnings<sup>2</sup>. However, around one-third of Russian respondents noted that their innovations were groundbreaking only to their companies.

Another survey the “Expert” media holding ran on 33 large corporations in 2010 complemented the picture and showed that practically all the large companies' innovative projects focused on the domestic market. Quite notably, while implementing R&D projects, many of them continue using resources of the former departmental research institutions, rather than centering on bolstering cooperation with small-sized start-ups<sup>3</sup>.

So, the major challenge is corporations' insufficient innovation activity from the perspective of both volumes and quality of R&D they implement or commission. The bulk of innovations appear imitations, with genuinely pathbreaking ones being noted on the local level. One of main causes behind such a situation is an insufficient level of competition and monopolistic position of many Russian corporations. Besides, the so-called administrative resource is still very strong and its use allows some companies, particularly large public ones, to take various economic advantages (lower tariffs, preferential interest rates, etc.).

At the same time, there is no demand for innovations, either. It is the middle class that forms their major consumer, but it is small in Russia. Some other economic reasons, albeit of a more specific nature, matter too. These are: an insufficient level of intellectual property protection, customs barriers, certification and technical regulation problems, among others. Finally, a whole set of challenges lie in the human resources field (the poor corporate “culture of innovation”, a small number of staff focused on development of innovations and an insufficient number of managers capable of efficiently implementing innovative projects).

A specific segment of the business sector is formed by small-sized start-ups. Their qualitative growth dynamic has long been negative. While in 2004 there were 22,500 start-ups in Russia, by 2009 the figure plummeted to 12,900, with their employees combined accounting

<sup>1</sup> Understood as corporations with no less than USD 100m in annual earnings (Source: Innovation by Large Companies in Russia. Mechanisms, Barriers, Perspectives. M.: RUSNANO, Russian venture Company, New Economic School, PriceWaterhouseCoopers, 2010).

<sup>2</sup> Innovation in Firms. Microeconomic perspective. OECD, 2009.

<sup>3</sup> Krupnyi biznes: kak stimulirovat innovatsionnyu aktivnost. Analiticheskiye materialy. M.: Media-holding “Expert”, 2010, p. 7.

for a meager 0.65% of the employed in the SME sector<sup>1</sup>. Small-sized start-ups are loosely connected to medium-sized and large firms. Many of them are research organizations and universities' spin-offs, but their ties to the mother organizations in many instances are unstable.

The rise of development institutions limelighted the catastrophic scarcity of small-sized companies at the “seeding” stage whose projects could be backed by venture financing. Mr. I.M. Bortnik, Chairman of the Board of the Foundation for support of development of small forms of enterprises in the scientific –technical sphere, holds that in order to hit the level of 1,000 venture deals a year, Russia “should support at least 10,000 start-ups to energize the venture industry”<sup>2</sup>, while today the country sees only some 2,000 start-ups emerge annually.

### Government Taking on Encouragement of Corporate Innovation Activity

To give fillip to public companies' innovation activities, in 2010 the Government decided to impose two “compelling” measures:

- The obligation to form corporate innovation development programs following requirements approved by the Government; such programs should be adopted together, rather than within, investment programs
- A “standard” proportion of spending on R&D to be set individually for each company, proceeding from its sectoral specialization and its comparison with peers overseas.

The Government compiled a list of 55 largest public companies (including RZHD, Gazprom, FSK “UES”, OAK, Rostekhnologii)<sup>3</sup>, which were suggested to design innovation development plans. It is planned to consider development plans by some 30 such companies in early 2011. The purpose of the exercise is to give boost to their innovative activities, bolster demand for innovations particularly by means of a significant “extension of introduction by companies of findings of outsider R&D carried out in the domestic sector for generation of knowledge and higher education, as well as the use of cutting-edge technologies, products and services developed by small- and medium-sized innovative enterprises”<sup>4</sup>. So, as far as public corporations are concerned, an attempt is made to link them with scientific organizations and to increase outsourcing, which, in contrast to worldwide practices, so far has been very moderate.

As in many other recent governmental projects, a particular emphasis is likewise made on cooperation between corporations and universities. It is envisaged that corporations would select *backbone universities and research organizations* to run joint research and technological works, form, in tandem with *universities*, research programs, mechanisms of exchange with research and technical, and marketing information, and the composition of works on forecasting research and technical development. Lastly, corporations should team up with *universities* to kick off implementation of programs on increase of the quality of education and staff training for hi-tech sectors.

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<sup>1</sup> Tormysheva T.A. Osnovnye problem, prep'yatstvuyuschiye sozdaniyu malykh innovatsionnykh kompaniy v vyzakh//Innovatsii i investitsii dlya modernizatsii i tekhnologicheskogo perevooruzheniya ekonomiki Rossii. Sb. Materialov. FGU NII RINKTSE, NP “Innovatika”, 2010. P.61.

<sup>2</sup> Ne poseesh- nepozhnesh//Nauka i tekhnologii Rossii. 02.11.2010. – URL: [http://strf.ru/material.aspx?CatalogId=223&d\\_no=34744](http://strf.ru/material.aspx?CatalogId=223&d_no=34744) Date of access: 07.02.2011.

<sup>3</sup> WebGround. Poyekt monitoring Runeta. – URL: <http://webground.su/topic/2010/08/03/t375/> . Date of access: 07.02.2011.

<sup>4</sup> Klepach A.N. O razrabotke program innovatsionnogo razvitiya kompaniy s gosudarstvennym uchastiyem. Presentation of 03.08.2010 r. [www.economy.gov.ru](http://www.economy.gov.ru). Date of access: 07.02.2011.

As concerns private companies, which are harder to “force” to develop and use innovations, the Government provides for other measures, a fraction of which appears important for encouraging innovation in the business sector as a whole, nonetheless, regardless of corporations’ property forms.

Private companies may bid for budget funding on R&D carried out in cooperation with universities; new tax incentive measures are going to be introduced for them; as well, it is planned to intensify the work on introduction of technical regulations and standards. At present the technical regulations and standards establish mandatory requirements only to 36.7% of products subject to the mandatory certification in the RF territory<sup>1</sup>. Meanwhile, penalties for breaching the said technical regulations and standards prove to be lenient and pose no challenge even to robust small-sized firms, let alone large corporations. The work on revision of the technical regulations and standards in 2010 was given a posh name of “creation of ‘technological corridors’” wherein technical regulation forms an element of a complex of measures, which comprises both stimulating and restricting ones. More specifically, along with harmonization of the regulations and standards according to international standards (the EU’s ones in the first place), which should make enterprises take more vigorously upon innovations, the Government will be funding their innovative projects. According to data as of the late 2011, the selection of projects has begun, and its main criterion is to make sure that upon implementation of the projects in question by 2015, enterprises will have been able to hit the sales volume of Rb. 15 bln.

Finally, the RF Ministry of Economic Development provides for private companies the possibility of introduction of the so-called “contract with the state”. Under such a contract, the state assumes obligations to back corporations’ interests on external markets (eg to lobby raising of customs duties on importation of rival equipment) in exchange for intensification of their innovative activities<sup>2</sup>.

Support and encouragement of innovative activities were also delivered through development institutions – Rosnano and the Russian venture company (RVC), in particular. So far these institutions to a certain degree have duplicated each other’s operations by developing and introducing similar concepts and arrangements, albeit in different sectoral segments. If improved, their coordination might ensure a new quality of the development of the national innovation support system. So far the “innovation lift” cited in various official documents and presentations has been practically idle, while new high-risk projects have spontaneously found support amid various structures operating in Russia.

As of 12 January 2011, Rosnano had approved 92 production projects and 7 infrastructural ones. Plus, the corporation funds another 31 educational projects and co-funds a number of projects on creation of investment funds (including Skolkovo). It is too premature to judge Rosnano’s performance, as the projects are at an early stage of implementation. Experts voice contrast opinions on the prospective viability of the selected production projects, and many of them criticize them. That said, Rosnano actually became the first institution that introduced a

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<sup>1</sup> Krupny biznes: kak stimulirovat innovatsionnuyu aktivnost. Analiticheskiye materialy. M.: media-holding “Expert”, 2010. P. 14.

<sup>2</sup> Presentation by Oleg Fomichev. Director of the Department of Strategic Management and Budgeting of the RF Ministry of Economic Development, as the plenary session “Large business and innovation” at the “Russian innovations” forum. Moscow. 27.05.2010.

mandatory procedure of international project evaluation and experts selection procedures with account of their past record.

Rosnano's project on establishment of nanotechnological centers seems promising, for such centers should radically differ from what used to emerge in the form of techno parks, innovation-technological centers and other suchlike infrastructural objects. The peculiarity of nanotechnological centers lies in concentration in the same spot of technological equipment and competencies on incubation of small-sized start ups (marketing, administrative, and information support). Substantial funding will be made available for creation of such centers, including earmarking for equipment purchases. The support will be extended over next 3-5 years. So, the concept for nanocenters has taken into account past mistakes (short-term funding, its small volumes, an absence of such expenditure items as costs of infrastructure and new equipment). It is planned that by 2015 there will have been as many as 12-15 such centers in Russia. By early 2011 seven centers had already been selected on the basis of competition. RVC establishes analogous structures, too. Thus, the Biopharmaceutical Cluster Fund created in 2010 under RVC will not only invest in biotechnological start-ups, but in the cluster's service companies as well. Given that there are just a handful of service and intermediary companies in Russia, such an approach seems very promising.

RVC's mission is two-fold: the company runs a contest-based selection of venture managing companies and acquires shares in venture funds these companies establish in the form of closed-end mutual investment funds. The initial expectations of RVC's performance were fairly high - it was envisaged that already in 2007 RVC would contribute to establishment of 8-12 new venture funds with the aggregate capital of some Rb. 30 bln. Those venture fund were supposed to be investing in companies at their early stage of development. According to the data as of early 2011, as many as 10 venture funds with the aggregate capital of a. Rb. 22 bln. had de facto been created. For reference: venture funds located in Silicon Valley outnumbered 300<sup>1</sup>.

A major challenge, however, does not lie with the fact that the number of operating funds have failed to match the initially planned figure, but with their performance – the existing venture funds so far have funded only 35 innovation companies. By late 2010 the Seed Investment Fund had approved 20 projects<sup>2</sup>, of which 8 ones fall under medicine and pharmaceuticals. This is an encouraging indicator, as until recently expenditures associated with improvement of the population's health and quality of life were relatively modest (and substantially inferior to traditional technocratic and production priorities).

Behind low operational performance indicators of the venture funds created by RVC were the same causes as those underpinning problems associated with development of small-sized innovation entrepreneurship. These are: an absence of potentially commercialized projects, the lack of qualified managers, a practical absence of business angels and, finally, problems associated with projects appraisal. While Russia has experts capable of running an adequate scientific and technological evaluation, the situation with business experts is catastrophic.

In the light of this, international aspects of the RVC's operations deserve a particular attention. In 2010, RVC established two funds in foreign jurisdictions, which implies access to the

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<sup>1</sup> Shekhovtsov M. Venchurnye fondy Rossii – pervye shagi i pervye itogi/Novaya ekonomika. Innovatsionny portret Rossii. M.: Tsentri strategicheskogo partnerstva, 2009. P. 195.

<sup>2</sup> Investitsionny portfel Fonda posevnykh investitsiy RVK/Rossiyskaya venchurnaya kompaniya. The data as of 17 January 2011. –URL: <http://www.rusventure.ru/ru/investments/fpi/portfolio.php> Date of access: 07.02.2011.



international market for technologies and new venture business practices, which domestic managers need to master.

In 2010, the Government embarked upon yet another new direction of improvement of the development institutions' performance and, at the same time, of bolstering the interaction between all the participants in the innovation system – that is, formation of technological platforms. Originally, they were understood as forums for discussions on critical projects and shaping of demand for them. Consequently, however, the concept evolved to imply a group of technologies which should advance with account of those sectors upon which the developed technologies will exert their influence. That said, creation of technological platforms should bolster hi-tech exports, an influx of private investment, and give rise to new hi-tech companies. Accordingly, businesses are to play practically a pivotal role in such platforms; the Government assumes that they should form no less than a half of their participants. In the meantime the Government also forges approaches to bundling the technological platform instrument with measures on “forcing” businesses to innovations (that concerns, primarily, large public companies – through the compulsory practice of their designing innovation development plans). Private businesses so far have treated the new initiative with caution – a typical record of their contribution to projects initiated by the Government proved negative; plus, they fear disclosures of confidential information in the process of coordination in the frame of technological platforms<sup>1</sup>.

The RF Ministry of Economic Development in tandem with the RF Ministry of Education and Science collected 140 applications for projects on implementation of technological platforms. By February 2011 a list of 10-20 state-sponsored platforms will have been built. One of the problems is that there is no vision as to which directions of development of technologies should form priorities for building such platforms: whether they should lie exclusively in the frame of the five “technological breakthrough” directions, or one should not limit himself with the officially set governmental priorities.

## Support of Small-Sized Start-ups

### *Regulation of establishment of small-sized start-ups*

The unfolding of development institutions, Rosnano and RVC among them, compelled the Government to focus more on problems in the area of support of small-sized start-ups. At the end of the day, it became obvious there were very few projects qualifying for the seed and venture financing, the old R&D potential practically exhausted, while a new one was emerging in an insufficient volume. Accordingly, ensuring emergence of new projects to be implemented by small-sized firms necessitates new incentives.

In August 2009, new Federal Act of 02 August 2009 № 217-FZ “On introducing amendments to individual legislative acts of Russian Federation on matters of establishment by budget scientific and educational institutions of economic companies for the purposes of practical implementation (introduction) of results of intellectual activity” came into effect. In compliance with the Act, budget research institutions, including the ones in the system of public academies of science, as well as universities that constitute budget institutions, may become, on a notifica-

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<sup>1</sup> Tekhnologichskiye platformy kak instrument modernizatsii ekonomiki//Nauka i tekhnologii Rossii. 16.11.2010. – URL: [http://www.strf.ru/material.aspx?d\\_no=34973&CatalogId=34910&print=1](http://www.strf.ru/material.aspx?d_no=34973&CatalogId=34910&print=1). Date of access: 07.02.2011.

tion basis, founders of economic companies established for the sake of commercialization of intellectual activity results. The Act reads that the said institutions can transfer *rights* to their intellectual property objects as a contribution to the small-sized firms' authorized capital.

One year after the promulgation of the Act in question, it is clear the small-sized entrepreneurship has displayed a certain progress; however, there are notable challenges associated with the Act per se, its interpretation by bureaucrats, research organizations and universities, as well as with objective limitations to its enforcement.

The main legal challenges are as follows: first, it is just rights to use intellectual property objects, rather than exclusive rights to them, that are transferred to newly founded small-sized start-ups' authorized capital. Where budget institutions contribute with one and the same non-exclusive license to several new small-sized start-ups, such firms have low chances to survive.

Second, in compliance with the Act, the budget institutions' share should make up no less than 25% in a joint-stock company and at least one-third in a limited liability company. This constrains advancement of partnerships between research institutes and universities with regard to establishment of a small-sized start-up, as at such a juncture each investor's share would plunge under 50% - the development any investor is unlikely to hail. Plus, this provision forms a serious hurdle to the small-sized start-up's development, for in the course of the second and subsequent rounds of funding, the budget institution's share shall not diminish (and that would block investment). Meanwhile, there is no mechanism of reassessment of already transferred by budget institutions and universities licenses. That is why to implement investment-intensive projects a small-sized start-up is left with a sole option at hand - that is, to resort to loans, which is a real albatross for a company of this size.

Third, the Act reads that research organizations and universities may contribute to the authorized capital with the right to use intellectual property results without the property owner's consent. However, in compliance with the Budget Code, budget institutions (bar autonomous ones) may not control property on their own and without the property owner's consent. The collision is set to be eliminated in 2011, after coming into effect of Federal Act of 08 May 2010 № 83-FZ "On introducing amendments to individual legislative acts of Russian Federation due to improvement of the legal status of public (and municipal) budget institutions".

Fourth, the budget institution may not sell its stock (shares) without its owner's consent. Enacted since 1 January 2011, Federal Act № 83-FZ grants budget institutions the right to exercise profit-making activities according to their statutory documents, while incomes resulting from such activities and assets acquired at the expense of the said incomes are subject to the budget institution's control.

Fifth, incomes research institutions and universities derive from their participation in a newly established small-sized company's operations can be spent not only on operations associated with commercialization of intellectual activity results, but on any of research institution or university's statutory activity. In other words, such incomes can be spent on purposes other than innovation development, which forms an incentive for management of such organizations to create small-sized companies, rather than to develop incentives for the rise of small-sized start-ups.

There also exists string of other challenges that are not associated with the legislation. More specifically, the acute cadres hunger is still there, so far as technology transfer procedures are concerned: not just specialists in this field, but even respective divisions at research institutes and universities appear missing. Meanwhile, it is critical that the law with regard to creation

and improvement of operational environment for small-sized start-ups is making a pretty dynamic progress.

That said, a serious complication is that the objective of enactment of Federal Act № 217 has undergone a certain transformation. Originally, the Act was supposed to boost the process of commercialization of intellectual activity results; however, it was consequently construed as a necessity for universities to establish small-sized companies and report on their performance. In this regard, all credit should go to the Ministry of Education and Science which started measuring the budget institutions' research and educational performance by using the number of newly created small-sized start-ups as a key indicator. That many such companies are founded for the sake of reporting, rather than for an actual realization of intellectual activity results can be proved by data on the value of intellectual property introduced as a contribution to the small-sized firm's authorized capital. As of November 2010, it accounted for under Rb. 20,000 at 72.2% of such firms<sup>1</sup>, which makes it impossible to launch commercialization, but pretty easy to find and attract, as per the law, an external investor that has the right to introduce his share into the statutory capital solely in the cash form.

Having construed the Act in this vein, universities began to fairly vigorously found small-sized forms, with their contributions to such companies' authorized capital largely being data bases and software. Meanwhile, companies established at the expense of the transfer of a patent and instrumental models account for just a. 10%<sup>2</sup>.

As of early-January 2010, out of 364 universities under the Rosobrazovaniye, 33 ones founded 116 economic companies with 881 jobs<sup>3</sup>. As of 4 November 2010, there already were 591 such companies, which is way below the planned indicators set by the RF Ministry of Education and Science, which had suggested that as of late-2009 there should have been 121 universities engaged in operations of 929 small-sized firms with 11,485 employees<sup>4</sup>. According to the Ministry, as many as 70-80% of small-sized firms established under research institutes and universities functions actively<sup>5</sup>, ie the Ministry's estimates appear more optimistic than the expert community's ones.

### *New measures of support of small-sized firms created under universities*

Encouraged by the enactment of Federal Act № 217, creation of small-sized firms formed just the first step – to grow and develop, small-sized forms need to have an access to funding. That is why the Government designed and implemented mechanisms of support of small-sized firms created by universities and measures aimed at intensification of ties between the university research and business on the whole.

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<sup>1</sup> Data of JSC “Tsentr aktsionirovaniya innovatsionnykh razrabotok”.

<sup>2</sup> Muravyeva M. Bez otkrytoy vuzovskoy statistiki uvazhaemykh reytingov u nas ne budet// Nauka i tekhnologii Rossii. 20 January 2011. - URL: [http://strf.ru/material.aspx?CatalogId=221&d\\_no=36411](http://strf.ru/material.aspx?CatalogId=221&d_no=36411). Date of access: 07.02.2011.

<sup>3</sup> Innovatsii v vuzakh: vyatotekuschiy rezhim// Nauka i tekhnologii Rossii. 18 January 2010. – URL: [http://www.strf.ru/material.aspx?d\\_no=26759&CatalogId=223&print=1](http://www.strf.ru/material.aspx?d_no=26759&CatalogId=223&print=1). Date of access: 07.02.2011.

<sup>4</sup> Source: Dyachenko O.G. O prakticheskoy realizatsii Federalnogo zakona ot 02.08.2009 г. № 217-ФЗ. A presentation delivered at a workshop on technological entrepreneurship. SFU, 15 October 2010.

<sup>5</sup> Rekomendatsii “kruglogo stola” na temu “Zakonodatelnoye obespecheniye protsessa inegratsii obrazovaniya, nauki i naukoemkogo proizvodstva kak klyuchevego faktora innovatsionnogo razvitiya Rossiyskoy Federatsii”. M.: Sovet Federatsii, 23.11.2010. P. 6.

The first measure implies a competition-based allocation of subsidies to universities on creation of innovation infrastructure. As many as 56 universities became winners of the 2010 competition, including 5 federal, and 20 national research universities<sup>1</sup>. They launched projects on support of three-year long programs of support of incubators, techno parks, legal protection of intellectual property objects, and advanced training programs on innovation activities for their staff.

Such a program is very timely, indeed. In practice, when it comes to even Basic innovation activity 101, the staff of technology transfer centers under Russian universities appear new kids on the block. Thus, for example, a 2010 evaluation of results of trainings in the field of technical entrepreneurship held by the US-based CRDF Global Foundation, showed that 90% of technology transfer centers staff who took part in the workshop found 90% of inputs fundamentally new to them, while the courses taught were basic ones and covered such issues as appraisal of intellectual property, the concept of venture capital, drafting business plans, development of network interactions, market entry technique and strategies, and interaction with investors and business angels. After the workshops, 73% of participants contemplated the imperative of developing a market entry strategy, 68% - perused where potential sources of financing could be found, and 64% - meditated over the need to develop new market entry strategies<sup>2</sup>. All this is yet another proof of the fact that prior to participation in the workshops the staff at the technology transfer centers had not ever tried such activities, not had they given a thought to the need for running some kinds of operations in relation to commercialization of R&D outputs.

The focus of the second governmental measure was on supporting universities partnerships with economic companies through allocation to the latter of subsidies. That was supposed to encourage universities to carry out R&D for the corporate sector. To this end, up to Rb. 100 mln. in federal grants is allocated annually on the competition basis to corporations that team up with universities, provided 100% corporate co-funding. As many as 112 projects submitted by 107 corporations and 99 universities became victors in the competition, with practically all the research universities (25 out of the total of 29) and the federal universities (6 out of 7) being among them. The group of leading universities that were granted the biggest volume of funding comprised MSU, MFTI, the Siberian Federal University, and LETI. Considering a university's size, small universities (MFTI and LETI) deserve a particular praise.

While the initiative is very green, it quickly became evident it was not thought through well enough. The participant corporations faced tax challenges, as they found themselves bound to pay the corporate profit tax on the grants they had received from the budget and transferred to universities to carry out R&D works. Meanwhile, the universities, in their turn, notwithstanding the funds were allocated from partner corporations and not from the budget, had to follow provisions of Federal Act №94-FZ on public procurements, nonetheless. As a result, a number of corporate winners in the competition refused to partake in the project.

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<sup>1</sup> 26 milliardov raspredelili po vuzam i kompaniyam// Nauka i tekhnologii Rossii. - URL: [http://strf.ru/organization.aspx?CatalogId=221&d\\_no=34073](http://strf.ru/organization.aspx?CatalogId=221&d_no=34073) . Date of access: 07.02.2011

<sup>2</sup> CRDF Technology Commercialization Practicum. Vladivostok, RF, May 25-27, 2010. End-of-Practicum Evaluation. CRDF Global, June 2010. P. 12.

## The Skolkovo Project as a Mini Model of the Innovation System

A new Government's project known as Skolkovo can be considered a future local model of a "perfect" innovation system. The RF President announced the start of its implementation in February 2010, and since then the work on the project has gained an unprecedented momentum. From its very onset the project was a state-run one, and this manifests itself in many aspects - from approaches to selection of its location to highest public officials monitoring constantly and closely progress in project implementation.

Originally, it was announced that the location for the innovation city would be selected using such criteria as developed infrastructure and its accessibility<sup>1</sup>. That is why centers qualifying for the criteria (Tomsk, Novosibirsk, St. Petersburg, Obninsk, Dubna, Zelenograd, among others) were ready to compete for the status of "innocity". But later at the level of the RF Government Skolkovo was picked, and it is a location that does not quite fit the criteria.

Apparently, there were two alternative approaches to the problem. The first approach implied building the innocity from scratch, so that it would bear no signs of legacy of the past whatsoever. The other approach was to erect it on the basis of one of the already existing technopolises or science campuses wherein investments had already been made in development of the innovation infrastructure and just a minimum additional construction was required. In the former case, the main reasoning is that in Russia, it is simpler to build something anew, rather than to change the mentality that was shaped for decades. In the alternative case, it was regions that have recently witnessed a substantial influx of investment in their innovation infrastructure, such as technical and engineering zones (Zelenograd, Dubna, St. Petersburg, Tomsk), that should have looked more attractive. Plus, the said complexes appear most akin conceptually to the innovation city concept.

That the ultimate choice was made in favor of a new spot casts doubt upon effectiveness of all previous governmental initiatives in the area of building innovation infrastructure. It is common knowledge that in the early 2000s the Government emphasized development of technopolises, with respective concepts and methodologies being developed with attraction of EU experts in particular. Then the funding was axed, and technopolises no longer were a priority. In 2006, the Government announced the start of a new infrastructural project – namely, building special economic zones (SEZ), including technical-engineering ones (TEZ). Presently, as many as four SEZ-TEZ have been established, albeit their performance has been low. Some other SEZ-TEZ have just begun developing, because of substantial delays with land development and infrastructure construction processes. What is known today of such zones is just the dynamic of the number of their residents, their investment and production volumes, and the number of jobs created therein. At the same time, residents do not have to physically reside in the zones – their residents are corporations that were registered in a zone and assumed obligations to invest in construction and implementation of science-intensive projects.

Over the 9 months of 2010 SEZ-TEZ became home to 26 new residents, but not so many of them started implementing investment projects. The TEZs' most general parameters as of 1 October 2010 are presented in *Table 19*. The data therein allows assertion that it is the Zelenograd zone that posts the record-breaking growth rates from the perspective of production volumes and the number of created jobs. Meanwhile, Dubna and Tomsk run neck-by-neck in terms of characteristics of the output volume per resident, and they both fall behind Zelenograd

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<sup>1</sup> Dmitry Medvedev provel soveschaniye po voprosu sozdaniya sovremennogo tsentra issledovaniy//The Administration of the RF President. – URL: <http://news.kremlin.ru/news/7061> . Date of access: 07.02.2011.

in this respect. As for the St. Petersburg zone, it is likely to have not started operating at a full capacity as yet. But it is hard to realize what lies behind the figures, what an actual situation in the TEZs is, what challenges they face and how they cope with them, for there is no information even on such generalized parameters as the nature of their output, the level of its novelty, main sales markets, etc.

Table 19

### Comparative Characteristics of Technical-Engineering Zones

Location	Area, as hectares	Number of residents	Residents' investment record through the whole zone's life, as Rb. mln.	Volume of residents' output, as Rb. mln.	Jobs created
St. Petersburg	129.4	36	148.0	–	–
Moscow (Zelenograd)	147.0	35	557.0	3 206.0	789
Moscow oblast (Dubna))	188.0	65	693.0	464.0	380
Tomsk	207.0	50	2 559.0	396.56	517

Source: Data of the RF ministry of Economic Development. Information as of 01.12.2010.

Skolkovo de facto emerged as substitute for the SEZ project, though in the event a SEZ could be considered one of vehicles for commercialization of Skolkovo's projects, both infrastructural projects might be considered interlaced. Skolkovo has already proved it made up a far more successful project compared with any SEZ. Thus, coordination of matters of land allocation, construction, selection of operational avenues has been completed at an incomparably greater speed. The financial resources that shall be allocated from the federal budget should also be unprecedentedly huge for an innovation infrastructure project: between 2010-2014 they should amount to Rb. 85.5 bln., including 9.5 bln. in 2010 alone<sup>1</sup>.

Already in the late-September 2010, Federal Act of 28.09.2010 № 244-FZ "On innovation center "Skolkovo" was enacted. It comprises a number of measures aimed at generation of favorable conditions of life and work in the new innovative city. More specifically, Skolkovo will be granted the following benefits and preferences:

- 1) Tax breaks for companies operating in Skolkovo: ten-year holidays with regard to the corporate profit tax, land and property taxes, a beneficial rate on mandatory insurance contributions (14% instead of 34%); the right of choice with regard to VAT payments for companies carrying out innovative activities in the territory of the zone, customs benefits;
- 2) Simplified technical regulation procedures;
- 3) Simplified procedures of the transfer of land from one category into another;
- 4) Special sanitary procedures and fire safety rules;
- 5) Relaxed conditions of interaction with authorities, particularly thanks to formation of special divisions of the federal authorities, such as the Ministry of Interior, the Federal Immigration Service, the Federal Tax Service, the Federal Customs Service, among others.

Skolkovo is an open project, i.e. it is supposed to be expanding in the course of its implementation. Furthermore, even its objectives and parameters should transform, too<sup>2</sup>. The pro-

<sup>1</sup> Innograd oboydetsya gosudarstvu v 85,5 milliarda rubley// Nauka i tekhnologii Rossii. 15 October 2010. [http://strf.ru/organization.aspx?CatalogId=221&d\\_no=34294](http://strf.ru/organization.aspx?CatalogId=221&d_no=34294) . Date of access: 07.02.2011.

<sup>2</sup> As asserted by the project executives. See, for instance: Yakubovich V. Sovety konsultanta: Bez prava na oshibku//Vedomosti. №210, 09.11.2010; Vaganov A. Izobretat nelzya zaimsnvovat//Nezavisimaya gazeta. 10.11. 2010. P. 11.

ject, indeed, has been evolving rapidly even in its conceptual part. The today's information suggests Skolkovo should be formed by four components:

- A backbone university;
- Research centers;
- Large companies' representative offices, which will tie up business and science, and start-ups;
- Infrastructural environment.

It is planned to organize research centers across five “technological breakthrough”, or cluster, avenues to have, at least, two centers for each avenue<sup>1</sup>, with their major objective being support of commercialization of R&D outputs.

One of Skolkovo's cornerstone should become a technical university. It is planned to build it on the model of (and with contribution by) MIT. At this point, the developments appear controversial. According to the Russian project executives, the signing of the contract with MIT is to take place in the spring of 2011. The contract provides for establishment of a new technological university with no BA training, but MA and postgraduate ones only<sup>2</sup>. The Government's plans suggest that the first enrollment should take place in 2014.

Meanwhile, the MIT staff believe that the problem of the degree of their engagement in Skolkovo has not been finally sorted out as yet. The US side argues that the RF Government's refusal to establish a full-fledged university is a mistake and the concept for the new university is reminiscent of the Russian/Soviet-style research institutes. That suggests that tuition of future BAs would be carried out using the old “templates”, and they would consequently be re-trained to earn a modern MA. As well, such cooperation cannot be fruitful, unless the MIT faculty and leading researchers succeed in finding Russian counterparts to develop joint scientific projects. So far such an intermutual process has been spotted on the peer-to-peer level, ie between researchers and faculty members, rather than on the executive one<sup>3</sup>.

This is particularly alarming, as the cornerstone of the concept of innocuity is getting stake of the overseas expertise in practically all the project's components. The Government admitted the nation was incapable to create a fundamentally new innovation city on its own, which is why an intense process of attraction of foreign organizations and individual experts is underway. Whilst the use of foreign expertise is a pivotal condition, it is important to bear in mind that it takes decades for a harmonious innovation ecosystem to unfold. In this respect, it is worth referencing to MIT as a model vehicle for arranging ties between science and industry: it took the Institute some 25 years to master the art of nurturing start-ups.

The main hopes associated with implanting overseas experiences lie with Skolkovo emerging as a center of expanding networks and horizontal ties, including social networks, and giving rise to a new culture of scientific, production and innovative activities. Meanwhile, one of the gravest concerns is that Skolkovo may mutate into an intellectual outsourcing center: in such circumstances Russia once again would be selling R&D outputs, with Western companies

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<sup>1</sup> The RF President's meeting with Viktor Vekselberg//Administration of the RF President. 13.05.2010 - URL: <http://news.kremlin.ru/news/7743> . Date of access: 07.02.2011.

<sup>2</sup> Innovatsii i chastno-gosudarstvennoye partnerstvo. A presentation by O. Alexeev, Vice President and Chief Managing Director for education and research of the Skolkovo Foundation at the workshop “Developing higher education and research in Russia and the Netherlands”. Moscow, the Mission of the European Commission to Russia. 24 November 2010.

<sup>3</sup> Source: the author's private correspondence with the MIT participants in the discussion on Skolkovo. The data as of 25 November 2010.

marketing them overseas, as the innovation environment and the domestic market for innovative products in the country have remained nascent.

It is envisaged that the project should start paying off no later than in 2015. Indeed, building a whole city from scratch takes quite a time. Hence, a logical question as to a possibility for the kick-off of implementation of innovation projects before the infrastructure is complete, ie. in the “virtual” mode. Pres. Medvedev first rejected the approach as he was afraid that under the Center’s signage “there will be functioning a whole lot of structures not at all associated with it”<sup>1</sup>. Later, however, it was decided that it would make sense to start funding projects (with all the benefits due) located beyond the future city’s boundaries. The process of selection of recipient projects started after adoption of the Skolkovo’s Mandate<sup>2</sup>.

Accordingly, leading Russian universities, research centers and foundations expressed their interest in contribution to projects under the Skolkovo’s aegis and started signing bilateral memoranda on cooperation with the Foundation for the Development of the Center of Development and Commercialization of High Technologies (Skolkovo Foundation). The list of university signatories comprises MSU, SPSU, Novosibirsk and Kazan state universities, the Bauman MGTU, MFTI, and SU-HSE<sup>3</sup>. It is planned that since 2011 the leading Russian universities will be entering into joint projects with their foreign counterparts on building laboratories whose operations will be funded by Skolkovo Foundation’s grants. Presently, as many as 20 such grants are envisaged to be awarded. The initiative appears to a certain extent similar to the RF Ministry of Education and Science’s megagrant project.

As concerns research organizations, it is Russian Research Center “Kurchatov Institute” that became a major partner to Skolkovo. The RRC should contribute with its research and technological base located in the only national center for nano-, bio-, information and cognitive sciences and technologies<sup>4</sup>.

As of early 2011, the Skolkovo Foundation had registered 16 research centers and institutes that became participants in the project. It is suggested that most projects should be oriented towards technology export<sup>5</sup>. That, on the one hand, proves some experts’ concerns that an absence of the domestic market for innovative products would entail an outflow of new technologies. On the other hand, export of technologies means an increase of competitiveness of Russian hi-tech developments and, to a certain extent, a turn to a “positive” trend, for so far Russian technological imports are far greater than exports.

Despite great expectations, the process of development of the innocity once again exposed problematic aspects of the governmental innovation policy. Those are, first, the selected approaches falling behind the global trends of innovation systems’ development. Thus, the con-

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<sup>1</sup> The RF President’s meeting with Viktor Vekselberg//Administration of the RF President. 13.05.2010 - URL: <http://news.kremlin.ru/news/7743> . Date of access: 07.02.2011

<sup>2</sup> The Mandate of the Foundation for the Development of the Center of Development and Commercialization of High Technologies (Skolkovo Foundation) “ as approved at the meeting of the Council of the Foundation for the Development of the Center of Development and Commercialization of High Technologies (Skolkovo Foundation)” and enacted on 28 October 2010. – URL: <http://www.i-gorod.com/en/newslist/201011001-mand/>. Extraction date: 07.02.2011.

<sup>3</sup> Skolkovo razdvigayet granitsy//Rossiyskaya gazeta. 21.09. 2010. - URL: <http://www.i-gorod.com/press/20100921003/>. Date of access: 07.02.2011.

<sup>4</sup> Penkina O. Priyutili. Kurchatovsky institut stanet vremennym domom dlya skolkovtsev//Poisk. №34-35. 27.08.2010. P 3.

<sup>5</sup> Fedorov E. Transformatsia zakonodatelstva v 2011 godu//Nauka i tekhnologii Rossii. 12.01. 2011. URL: [http://strf.ru/material.aspx?d\\_no=36176&CatalogId=223&print=1](http://strf.ru/material.aspx?d_no=36176&CatalogId=223&print=1) . Date of access: 07.02.2011.



cept of building a “closed”, in many respects, city and a clearly visible in the Skolkovo’s Mandate linear model of innovation process (from R&D towards development) is at odds with the contemporary logic of innovation-based development. Nowadays, it is increasingly seldom a case of innovations advancing in isolation<sup>1</sup>, as networks expand and so do stakeholders, institutions and end-users’ networks. The trend implies abandonment from closeness in all its senses and transition to “open innovations” and global innovation networks, and re-valuation of significance of various kinds of “zones”.

Second, one can notice some idealization of foreign experiences coupled with the use of a combination of different Western approaches: the Skolkovo’s fathers have opted for a few models at once, rather than for a single model, for instance, Silicon Valley (though it is much referenced to in the context of the building of Skolkovo). They consider and partially adopt elements of techno parks, technopolises, and one can trace some analogy with the UAE’s Masdar City. An attempt to integrate elements of different models is a very challenging task, as it is not easy to ensure their synergy.

Third, as before, the Government failed to run a hindsight evaluation of initiatives implemented to date. If completed, it would have enabled one to advance more efficiently, particularly with a due account of past failures. With the record of building science cities and research campuses at hand and being aware of a subsequent evolution of “closed” cities, one needs to think through additional measures to cope with phenomena, particularly social ones, which might emerge in the course of the city’s “ageing”. Thus, sooner or later, a limited number of land sites at Skolkovo will ultimately hurdle its expansion. The planned approach, which provides for leasing the housing, rather than selling it to the residents<sup>2</sup>, does not help overcome potential constraints facing Skolkovo’s growth.

So far Russian corporations and the national research community have remained moderately optimistic regarding Skolkovo’s prospects. According to a sociological survey Corus Consulting ran on high- and medium-level Russian corporate executives, 27% of respondents believe the project is going to be a success, another 23% holds the opposite view, while another 48% considers the idea to be a good one in principle, but doubts the possibility for its actual implementation<sup>3</sup>.

## The Government’s Plans on Shaping Efficient Science

In the nearest future, the Government is going to bolster initiatives aimed at increase of the research sphere’s efficiency. The initiatives in question are laid down in the draft Strategy of innovation development of Russian Federation through 2020 the RF Ministry of Economic Development unveiled on 31 December 2010. The Strategy specifies the following development priorities for the national research complex:

The first priority, whose implementation has already been underway, is formed by a set of measures on boosting the university science. That said, the text of the Strategy implicitly holds that over time universities should substitute for RAS as core centers of the national fundamen-

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<sup>1</sup> Draft Ministerial Report on the OECD Innovation Strategy: Innovation to Strengthen Growth and Address Global and Social Challenges. Key Findings. Paris: OECD, February 26, 2010. P. 6.

<sup>2</sup> Minutes of the meeting of the Commission on modernization and technological development of Russia’s economy. The Administration of the RF President. 29.04. 2010. – URL: <http://news.kremlin.ru/transcripts/7585>. Date of access: 07.02.2011.

<sup>3</sup> Predprinimateli ne veryat v uspehnost Skolkovo// Nauka i tekhnologii Rossii. 01.10. 2010. – URL: [http://strf.ru/science.aspx?CatalogId=222&d\\_no=33960](http://strf.ru/science.aspx?CatalogId=222&d_no=33960) . Date of access: 07.02.2011.

tal science. Specifically, the document reads that research universities “should form a nucleus of the new integrated research-educational complex that will ensure ...conduct of a significant proportion of the fundamental and applied research”.

The second priority concerns the sphere of applied research and implies establishment of national research centers, particularly on the model of NRS “Kurchatov Institute”. Whether the latter’s performance is adequate and, accordingly, whether it is worth replicating this model sparked animated discussions in the research community. Their opinions, as a rule, appear not that positive. Meanwhile, it is not easy to understand how the RIS has advanced, as there are no objective data in this respect. But there are concerns that the model results in monopolizing a given sphere of research, which hardly can form an incentive to boost efficiency.

The third priority is the human resources policy. The Strategy enumerates quite a number of measures in this respect, including a few brand new ones, such as introducing a status of the “federal research fellow” or implementing a pilot program on attraction onto executive positions at federal and research universities of specialists with the respective record with leading foreign universities.

The fourth priority is improvement of financial mechanisms, focus on priority scientific and technological development avenues, optimization of grantor organizations’ performance. The work in this direction is currently underway, too.

So, the clearly manifested themselves over 2010 scientific and innovation policy priorities may further unfold as long-term ones, which, in principle, should help enhance the quality of the public regulation.

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The year of 2010 the current controversial state of the national science. On the one hand, judging a string of indicators, its disruption continued, particularly as far as cadres are concerned. On the other hand, its significance is propped up by certain selected organizations (the status universities) and territories (Skolkovo) wherein a sizeable budget funding has poured in.

From the perspective of innovation activities, the business sector appeared very heterogeneous, with large corporations no longer being overly passive, albeit not so much in anticipation of research organizations, universities and start-ups’ produce.

The Government attempted to establish linkages between science and businesses and boost development of small-sized start-ups, but the policy was poorly coordinated at the interdepartmental level. That said, the Government’s presence in the national research and technological complex still is excessive and it tends to dictate, rather than regulate.

The Government’s active engagement has produced an adverse impact on the development of network interactions, the rise of new grass-root initiatives and their natural spread. That is why horizontal ties, the institution of intermediaries, small innovative entrepreneurship, flexibility and diversity of interactions between science and business – all the components underpinning an innovation system’s sustainability- have so far remained at their nascent state.