

Russia: Focus on Innovation

Public analytical report on the implementation of the Strategy for Innovative
Development of the Russian Federation for the period until the year 2020

Release I

Project Integrator



The Report has been prepared with the assistance of the Ministry of Economic Development
of the Russian Federation

Moscow, 2013



About the project

The first public analytical report on the implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 was prepared in April 2013 by Russian Venture Company (RVC) with help from Ministry of Economic Development, development institutions and market players.

It is the beginning of an annual series of reports that will inform the public in Russia and abroad about how the Strategy of changing to an innovations-based, socially oriented economy is being carried out.

The report is addressed to businessmen in technology sectors, small and medium-size companies, educators, scientists, investors, analysts and journalists, those involved with the support ecosystem for innovations, managers in the real economy and federal and local officials. Its structure follows closely that of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

The experts concentrated on:

- efficiency of government initiatives to support and promote innovations;
- success stories of innovators that showcase best industry practices and reflect the real efficiency of the state support;
- infrastructural, market and technological factors favorable to the Strategy's goals and objectives;
- obstacles.

One of the most important tasks of the project was to create a pool of expert opinions for bolstering the shift to innovations.

Materials from the Ministry of Economic Development and other government bodies, development institutions, statistic studies and open Russian and foreign sources were used in the preparation of the report.

Much of the information came directly from players on the innovations market — start-up founders, business angels, managers of venture and Private Equity funds, top managers of leading Russian and foreign technology firms. The report's conclusions and suggestions are the result of collective efforts to evaluate the work done by spring 2013 not only by the government and development institutions, but all those involved in innovations.

More than 80 experts contributed their opinions on the Strategy's success so far and recommendations for the future.

In April 2013 the workgroup preparing the report also surveyed 155 players on the Russian innovations market. The output of the statistically processed obtained data is also included in this report.

RVC is the system integrator for the preparation and release of the series of annual public analytical reports. Acting as the integrator in the course of the project implementation, RVC collaborates closely with Russian government offices, development institutions, the expert community, research and science groups, educational institutions and market participants.

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The main feature of the innovation-driven economy is that it is, at all times and in all places, based on the person as a means of transferring skills, creativity and business motivation. It is the quality of human capital, rather than the mere presence of infrastructure and financial resources which support innovation, that determines the successful building of a knowledge-driven economy. Human resource development in the fields of science, education, technology and innovation is deemed a priority for Implementation Phase 1 (2011-2013) of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

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In most countries, it is the commercial sector that is the main "customer" and "consumer" of innovations. The average share of corporations in national R&D expenditure across member countries of the Organisation for Economic Co-operation and Development (OECD) is 65-70%. In Russia, this figure in 2010 was at just above 20%. That is why encouraging innovative business activity and creating an environment conducive to innovation are the most important challenges to be addressed in Strategy Phase 1.

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Science is at the core of an innovation-driven economy. Throughout the 2000s, Russia steadily increased its public investment in R&D, but failed to adequately improve the effectiveness of its science in any measurable way. Therefore, when implementing the Strategy, special attention is being paid to the structural modernization of the knowledge generating sector, as well as to the development of the mechanisms for introducing scientific research outputs into the stream of commerce and the development of the private sector.



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The state not only acts as a subject for policy modernization policy and innovative development — it is itself subject to this policy; i.e. it is the state machine that should experience a qualitative change in the course of economic transition from a raw model to one driven by innovation. An innovation-driven economy is not possible without an innovative state, which itself requires strategy to gain significant efficiency.

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Innovation infrastructure is the foundation of the new economy. It is formed not only of tangibles (science parks, business incubators, etc.), but also of a financial support system, including a venture capital industry, an infrastructure of service and competence specialized in providing services to high-tech companies, as well as of information systems that secure interactions and data exchange among those participating in the innovation ecosystem. The Strategy involves the development of appropriate institutions and the elimination of infrastructural gaps, whose presence has hindered innovation in Russia's economy.

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We live in a world where the high-tech sector is largely globalized, and the world's high-tech leaders are "cosmopolitan" in terms of markets, production facility location and R&D. A global market structure such as this requires national economies and individual players with global ambitions to introduce new approaches and strategic solutions into their roles in the international division of labor and functions as part of global value chains.

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The shaping of an innovation ecosystem in most mature economies at a certain stage of history led without fail to the emergence of regional innovation clusters — areas of high-gear innovation processes and technology "genesis", where all ecosystem members demonstrate elevated concentrations. The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 provides for the establishing of a network of regional industrial clusters, the unlocking of the competitive potential of the territories, as well as the building-up of a number of innovative high-tech clusters.

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O. V. FOMICHEV

STATE SECRETARY—
DEPUTY MINISTER
OF ECONOMIC
DEVELOPMENT

You hold in your hands the first issue of the Annual Public Report on implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

The Strategy lays the groundwork for the government's long-term policy in innovations. Its execution will determine just how and how quickly Russia manages to transform itself from a country trailing economic superpowers to a global technological leader.

The country sets the course for innovation not because of a bloated pride. Competition in the world's markets is getting stronger, the rate of technological changes increases year after year. It is important that the Russian Federation stay in this general trend, use what scientific, technological and human resources it has to earn member's rights in the emerging club of innovating nations.

The Ministry of Economic Development endorses RVC's initiative to release a series of independently prepared reports on the Strategy's progress.

An economy-wide modernization and adoption of innovations is only achievable with an

Dear colleagues!

intimate cooperation of the state, science and business as well as the people's involvement in discussing and achieving the objectives we set. But the main actor is certainly business. An emphasis on involvement of private capital is central for the Strategy for Innovative Development of the Russian Federation for the period until the year 2020. The Government enacted the basics of the Strategy in December 2011. Its thrust is to sharply increase business' involvement in innovation — both for upgrading technological processes and for taking to market original and globally competitive products.

It is, then, important to mention that Russia's business community was actively involved with the report. Technological entrepreneurs, business angels, investors, managers of leading Russian and foreign companies all contributed valuable advice and suggestions for its pages. Engaging players from the emerging innovations economy as experts and analysts is an element of the feedback mechanism to connect the market, the development institutions and offices of the government.

The Strategy lays emphasis on structural reforms and improving the environment for innovations. As the Report shows, in a number of directions significant results have been achieved in this year and a half. For example, the government's and the development institutions' efforts to form a support infrastructure for innovation have received a fairly high appraisal from the players.

Development institutions have been established, motivating to invention and commercial use of technology. We try to introduce, on budget funds, effective instruments to help connect science and business. Admittedly, the participating parties have pointed out a number of issues and obstacles the Russian economy must overcome on its way to an innovations-based and socially-oriented profile.

The economy remains resistant to changes. And even with the main controls and instruments more or less in place, in some directions progress has been small. This is true for the quality of business environment in the country — something innovations companies are sensitive to.

The obstacles are at the center of attention of the President, the government and the development institutions. They are an issue of first importance to market players as well. The first issue of the report shows that innovations companies are ready to actively participate in creating a knowledge-driven economy, openly discuss programs, give fair recognition to positive changes as well as suggestions of their own.

The report, in my opinion, gives a rather balanced and objective overview of the situation. Much works remains to bring development in the innovations sector to bear on Russian people's quality of life. That is the Strategy's ultimate purpose. But let us keep in mind that Russia already has comfortable conditions for innovations in place. Our country attracts more and more attention from foreign investors who think highly of Russia's intellectual and scientific potential and the government's success in installing supports.

I would like to express my gratitude to the project integrator — RVC, other development institutions, innovators and experts who served as the report's co-authors.



I. R. AGAMIRZIAN

CEO AND CHAIRMAN
OF RVC

Dear friends, colleagues and partners!

The first full year of the The Strategy for Innovative Development of the Russian Federation for the period until the year 2020, approved in December 2011, has passed. This is a good moment to review the first results and plan the steps to be taken.

Let me begin by thanking the Russian Ministry of Economic Development, other ministries and government offices as well as my colleagues from the development institutions, both for their support of RVC in preparing this series of annual public analytical reports on the on-going implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020, and for the information they have provided.

The Strategy from the beginning has been the result of a collective effort by a community of experts from the government, science, education and business. Our workgroup also drew on collective resources in preparing this report. We invited contributions from the actors of the innovations process — technical entrepreneurs, business angels, venture investors, managers of development institutions, incubators and tech parks, executives of leading Russian and foreign companies, and many others.

I would like to express my sincere gratitude to all of the experts for their honest, professional and considered opinions not only on our achievements, but also on the problems we still have to solve by

joint effort in order to reach the main objective of the Strategy: a modern, effective and socially-oriented innovations-based economy. The growth strategies for the innovations sector we have gathered while working on the report should be especially useful to that end.

Although the idea of the report belonged to RVC, which also served as its “system integrator”, there is no doubt that its real authors were the players on the Russian innovations market.

This first in a series of scheduled reports is an attempt to analyze the early efforts of Russia’s innovations community and the obstacles still remaining. It is an encouraging thought that all the participants of our young knowledge-based economy, from large industrial producers to private venture investors and start-up founders, are eager to share with the government and its institutions concern and responsibility for advancing Russia on the course taken.

The reports also aim to help create analytic benchmarking tools for regular, independent expert assessments of progress with the Strategy. These would help single out the best innovating practices and new infrastructural, market and technological challenges and roadblocks that we meet.

I hope the annual publications will become an important tool for information exchange between the market, the government and the development institutions responsible for carrying out the Strategy.

Combined efforts of these three groups aimed to strengthen the Russian innovations sector are already bringing about tangible results. So say not only the analysts at home, but international observers. To take the Russian venture investments market, early in 2013 The Wall Street Journal published the results of a Dow Jones VentureSource survey. It showed Russia to be Europe's fastest-growing venture market for 2012 and fourth-largest by investments volume. At the end of the last year, Bloomberg gave Russia 14th place in its list of the world's 50 most innovative countries.

The foundation of an innovations sector has been laid. The Strategy is being implemented, industry-wide and federal programs complementing it are being adopted and brought into effect, the development institutions have created mechanisms to support innovators, private capital is becoming more and more involved, scientific institutes and the educational system are being reformed. Now it becomes vital to keep the pace, break through barriers and use new instruments.

Serious progress is needed in all of the key directions defined in the Strategy. Creating innovations competences and nurturing companies' demand for them, modernizing science and the support infrastructure, involving Russia ever more actively in the international innovations system, speeding reforms in the regions, upgrading the legal aspect — all

these are important to make the "innovation lift" available for the whole economy.

Our society already understands the importance of innovations for economic growth. But I think we should take a wider view: innovation in the last ten years has in a sense become the main opportunity and the chief challenge for all humanity. And we need to evaluate that challenge very carefully to respond effectively with the resources we have.

Much remains to be done. We need to remove one by one many obstacles to innovation, correct industry-wide and sector-wide imbalances and bias. We also need to solve the problem of market size. At the moment innovative products and services make up 11 to 15% of Russia's Gross Domestic Product, compared to 30% and more in developed countries. Our immediate objective for the next few years, then, is to multiply the share of innovations in the GDP.

Quick and effective implementation of proposed concepts and plans is now becoming the chief measure of the efforts of the government, business and the development institutions. The time for declarations has passed. Now it is time to act — decisively, effectively and in concert. We have what it takes: knowledge and the ability to keep learning, experience and energy. But what drives us most of all is the desire to make our country a place that is modern, comfortable to live in, develop and thrive!

Report Experts

The working group for the report would like to express their sincere gratitude to the experts who have provided suggestions and recommendations for the future development of innovation support infrastructure for the successful implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

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From Concept to Strategy

“At the heart of our economic policy must be making competitive all those elements vital to conducting business in Russia — from affordable credit and tax stimuli to administrative convenience and low inflation. This is a direct and practical path towards renovating the economy and moving away from dependence on raw exports. Tens of thousands of new projects would then become profitable: in processing, in engineering, light and heavy industries, in the services sector, in the small and medium business sector and, of course, in agriculture”.



V.V. Putin, from the Presidential address to the Federal assembly, 12 December 2012, Moscow, Kremlin.

Russia is facing serious global economic challenges, and its answer to them will determine whether our country will remain a world power and what role it will play in the XXI century.

The last decades saw strategic changes on the arena of international competition. We know, so far — mostly from others' examples, that innovations can propel an economy to new heights. But building an innovations-based economy requires systemic action in many different fields. A strong innovations-based economy needs an effective system of government, low levels of corruption and administrative pressure on business, a sophisticated entrepreneurial culture, a healthy and self-sustaining innovations ecosystem, cut-

ting-edge science and modernized education, a properly structured system to support innovation and nurture intellectual capital.

Aside from traditional competition of markets, capitals, technologies and workforce, nation states in the XXI century challenge each other in jurisdictions, pulling promising start-ups and high technology business away from each other as much as they can with favorable environments.

An innovations-based economy requires complex changes and long-term planning. In Russia the government's and business' main intentions in this direction are contained in the Strategy for Innovative Development of the Russian Federation for the period until the year 2020, approved by the government in December 2011. This report attempts to summarize the results of the Strategy's first complete year in action.

INNOVATIVE ECONOMY: ACHIEVEMENTS AND ISSUES

Development logic.

Before we begin with the year's summary for the Strategy for Innovative Development of the Russian Federation for the period until the year 2020, a few

According to the Federal State Statistics Service, every rouble invested in technological innovations in 2011 gave

3,9 roubles

of payoff as innovative products and services.

words on that document's origins. It was based on the Conception of the Long-Term Social-Economic Development of the Russian Federation for the period until the year 2020, approved on 17 November, 2008 by Government Order No. 1662-p.

The Concept's main purpose had been to find ways to ensure long-term prosperity of the population, national security, dynamic economic growth and Russia's improved international standing.

It had taken into account the record of Russia's development in the 1990s and 2000s, including a landmark achievement — Russia by the middle of the first decade of the XXI century had rejoined the world economic powers. The country had mostly completed its change to a market economy and created a basic grid of modern legal norms and institutes. Most important, it had reached a point where it could begin to shift from recovering losses to establishing an effective economy of a new kind.

At the time of the Concept's approval Russia's readiness for an innovations-based paradigm had already been evidenced by a convincing set of arguments, including those set out in the Main Directions of the Russian Federation's Innovative System Development Policy for the period until the year 2010 (approved in 2005) and Strategy of development of science and innovations in the Russian Federation for the period until the year 2015 (approved in 2006). The Russian economy had become significantly more open and, on the whole, macroeconomically stable, dampening external shocks with accumulated international reserves and a sturdy financial system.

Reasons for paradigm change

For all the problems it had brought, the economic crisis of 2008-2010 had shown the Russian economy generally and its financial sector in particular to be fairly stable and flexible systems, given proper state involvement. The country now had a powerful layer of developing companies, many of them not only competing successfully in the domestic and foreign markets but actively attracting development capital. The tendencies to social confrontation seen in the 1990s had been overcome, civic institutions had been growing fast and political and economic risks for businessmen had diminished.

Russia had been broadly acknowledged as a market economy with a high investment-grade credit rating.

A new administrative system had been installed with legal separation of authority between the Federation, its constituents and municipalities. Modern methods of strategic planning and results-based corrections had been introduced into government work. The fiscal and budget reforms and a number of laws on land and the judiciary, alleviation of administrative burden on small businesses had paved the way for innovations-oriented development. National projects in education, health care, residential construction and agriculture had significantly modernized these areas, removed or brought down harmful disproportions.

Steady economic growth had been the result. Russia had overcome the decline of consumption and production of 1990s: by 2007 its GDP had reached 110% of the level of 1991, and the economy had been favoring more and more demand-driven industries.

By the time the Concept was enacted, the country had reclaimed its status of an economic power. Yet another all-important challenge was looming close — a new global challenge.

A wave of technological changes had brought innovations to the fore of social and economic development worldwide and overshadowed traditional growth factors. Economic development was being increasingly driven by human capital — another indication that the old raw exports-based model had run its course. Boosting exports of fuel and raw materials and serving internal consumption with what capacities remained, with the rouble rate and costs of resources such as labor, fuel and power held at artificial lows, no longer served to win the global conquest.

Challenges and limitations.

Working on the Concept, internal limitations of underdeveloped transport and energy infrastructures and a deficiency of qualified engineers and workers became apparent. So did the threat of plummeting growth, if the old habits continued. Structural limitations were obviously coupled with a number of unsolved social and institutional issues.

INNOVATIVE DEVELOPMENT CHALLENGES

A national innovative ecosystem is taking shape now in Russia. It includes institutions that support high-tech business projects at all stages of development. Efficiency of the system depends on measures taken at the levels of development institutions and environment for innovations in the country.

At the level of existing development institutions and the overall innovative development ecosystem:

- Give the emerging system time to show results and outline a clear strategy and key performance indicators for each development institution;
- Prevent competition between government development institutions and the private sector in the innovation sphere and apply a principle of "the state follows the market".

At the level of the start-up and innovation environment:

- Focus on the conditions and efficient forms of development of academic and applied science, and build innovative university-based ecosystems;
- Substantially increase government investments in the seed and pre-seed stages.

At the level of general institutional conditions in the country:

- Acknowledge that substantial progress is impossible without an independent judicial system, smaller share of the state in the economy, curbing corruption and ensuring political freedom;
- Facilitate border-crossing and visa-processing procedures, particularly for international innovation centers, and provide more tax incentives for intellectual activity inside Russia—bringing foreign entrepreneurs to work in Russia could have a major economic effect in combination with the development of a strong natural science and research base;
- Create completely new and up-to-date educational centers of global significance in Russia.

Declaration of results achieved at the Moscow International Forum for Innovative Development "Open Innovations 2012".

A NEW DEVELOPMENT VECTOR

Effective use of available resources.

The Concept's framework was developed in the Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

Changing to an innovations-based, socially-oriented economy is the only way to ensure prosperity of the citizens and the country's place among the planet's decision-makers. The Strategy for Innovative Development of the Russian Federation for the period until the year 2020, enacted by Government Order No. 2227-p on 8 December, 2011, is a long-term roadmap towards an innovations-based economy. The Concept's main theses from three years earlier are there expanded.

By the time of the Strategy's introduction the Russian innovations environment had gathered both successes and serious problems.

The volume of government spending on fundamental science and applied technologies had been growing steadily (increased 1.6 times between 2006 and 2008), including the money available from federal special purpose programs and state funds. Groundwork had been laid for a system of development institutions, including the Foundation for Assistance to Small Innovative Enterprises in Science and Technology, venture funds, federal-owned via Russian Venture Company (now RVC), Russian Foundation for Technological Development, state corporation Bank for Development and Foreign Economic Affairs (Vnesheconombank) and Rusnano Corporation.

Much effort and funding had gone to stimulate research and innovations in higher education, attract to R&D work in Russian colleges world-class scientists, uphold colleges' cooperation with business. Work had begun on national research centers, the first based on the National Research Centre "Kurchatov Institute". Support infrastructure for innovations had been created, with special economic zones favorable to resident innovators, knowledge cities, tech parks, business incubators, technology transfer hubs and federal scientific equipment pools. Work had started also on an innovation center Skolkovo. Russia had been seeing more vigorous efforts to im-

prove innovations' legal aspect, and its leadership had kept watch on modernization and innovation on the whole. For example, a Presidential Commission for Modernisation and Technological Development of Russia's Economy had been formed.

But a number of blocking tendencies had remained, Russian's innovations market had been slow to integrate with the global, sluggish and ineffective, including the state-owned companies. There was still much to be done for productive communication between science and business and to advance commercialization of research of academies and colleges to the level seen in the advanced members in the OECD. State funding for R&D was often spent ineffectively in most sectors of the economy.

On the whole, the economic milieu remained not quite favorable for innovations until the Concept of 2008 and the Strategy that came later. Macroeconomic stability, social spending and modernization of the infrastructure had been higher priorities. Attention had been given mostly to support of demand in the R&D segment, with upholding innovation in business, in the regions and in education remained in the back seat, all this detracting from an integrated approach.

The Strategy was made to address this situation.

THE STRATEGY'S GOALS AND STAGES OF IMPLEMENTATION

Qualitative and quantitative goals.

The Strategy did not come out of study rooms of theoretical planners but was the result of hands-on cooperation between numerous experts from the state academies of science, business, research, investment, analytics and the government. This open format allowed for a balanced plan of action that received support from every corner.

The Strategy develops the Concept along with the budget planning and such systemic documents as the Russian Energy Strategy Until 2030 and the Russian Federation's Transportation Strategy Until 2030. The state-managed programs most important for achieving the Strategy's goals were Economic Development and Innovations-based Economy, Development of Science and Technology, Education

EXPERT OPINION



“Russia's young innovations market needs most of all experience with modern business models oriented at companies with quick growth. There also isn't enough experience in coming out to global markets. Practice is always the best teacher. But relying on trial and error alone would be careless, it would slow down development of innovations in the long run. To stimulate this market, its players need to be “trained”. And not just businessmen, but investors also. Without “training” them we will have to wait several times as long for an economically noticeable change. Strategic planning, forming a product image, using business models with a global division of labor — these “innovative individual” competences are what Russians need the most.

ALBINA NIKKONEN,
EXECUTIVE DIRECTOR OF
RUSSIAN VENTURE CAPITAL
ASSOCIATION (RVCA)

and Information-oriented Society (2011-2020) and many others. As of 30 March 2013, the programs Information-oriented Society (2011-2020), Development of the Nuclear Industry, State Program of Agricultural Development and Regulation of Agricultural Produce, Raw Materials and Food Markets, Development of Education, Development of Science and Technology, Development of Pharmaceutical and Medical Industries, Development of Electronic and Radioelectronic Industries, Development of Health Care, Development of the Ship-building Industry, Development of the Aviation Industry, Development of Industry and its Competitiveness, Environmental Protection, Russian Space Activity, Economic Development and Innovations-based Economy had all been approved¹.

The Strategy aims at setting the Russian economy on an innovations-based development track by 2020. The milestones are both qualitative and quantitative, e.g.:

- increasing the share of industrial companies employing technological innovations to 40-50% of the total number (9.4% employed them in 2009);
- boosting Russia's share of the world high technology markets and services (atomic energy, aviation, space technologies and services, special purpose ship-building etc.) to 5-10% in 5-7 or more sectors;
- bringing the Russian share of high technology exports to 2% of the world total (0.25% in 2008);
- increasing the GVA of the R&D sector to 17-20% of the GDP (12.7% in 2009);
- raising the share of innovations products to 25-35% of the total industrial output (4.9% in 2010);
- raising internal spending on R&D to 2.5-3% of the GDP by 2020 (1.3% in 2010), more than half of that from private investors;
- increasing Russian representation in the global scientific press to 3% (2.08% in 2010);
- raising the citations per article ratio of Russian research indexed in the Web of Science database to 4 references (2.4 citations in 2010);

¹ Here and below we use information from the Ministry of Economic Development's report "Progress in Implementing the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 (2012)" from March 2013.

Main global challenges to Russia's innovations development



- Technical acceleration of the world economy. Russia begins to see pressing competition not only from leaders in innovations but from many developing countries and the CIS. The revolution in energy conservation and alternative energy makes the future of the country as a supplier of traditional energy sources highly uncertain.
- Worldwide struggle over highly qualified workers and investments in new technologies and competences as determinants of new economies' competitive position.
- Climate change, an aging population, problems of health care systems and food safety for the planet are challenges not only for our country but for all of humanity.

These challenges demand proactive development in specific research directions and technological sectors, e.g. "clean" energy, genetic medicine, new technologies in agriculture. Russia lacks significant achievements in many of these.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020

- increasing the number of Russian schools in the world's top 200, according to Quacquarelli Symonds World University Rankings, to 4 (1 was listed in 2010);
- increasing the number of patents registered annually by Russian physical and legal persons in the EU, the USA and Japan to 2.5-3 thousand (63 were registered in 2009);
- increasing the R&D portion in the leading Russian universities' funding to 25%.

The Strategy implies synergy, with the general economic growth and the speed of innovative development growing more in sync year by year. It should then be possible to make innovative development the main driver of growth with increased productivity of labor and efficiency of production in all sectors,

larger markets, more competitive products, creation of new industries, more investments, greater population income and consumption.

Innovative development is expected to contribute another 0.8% to planned annual growth as early as 2015. On the other hand, economic growth will make new products and technologies possible, allow the government to increase spending on human capital (most important, on education and fundamental science) and support of innovations, which will invigorate the process even more.

Partnership of the state and business.

The Strategy's open and market-based character is evidenced by the fact that it will be driven mostly by means other than investments from the state budget. Of course, the turn to an innovations-oriented course involves a "budget pushoff". Still, **business** is the main actor of the Strategy, and business' active involvement is required for success.

The State Secretary — Deputy Minister of Economic Development O.V. Fomichev wrote the following in the preface to the official publication of the Strategy: "The key measures of the Strategy approved by the Russian government in December 2011 imply a sharp increase in business' innovations-oriented activities, with modernizing technological processes and introducing new, globally competitive products both required. Without making the economy responsive to innovations investments in other links of the national innovations system will have low returns. The Strategy's developers needed to formulate a comprehensive government strategy until 2020, which meant arranging the measures for a systemic approach, balancing them and tuning for maximum synergy, creating coordination mechanisms, finding "hard spots" in innovative development and offering new ways to through them, distributing resources between fields based on their importance for development of innovations"².

Key implementation principles

The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 follows these main principles for its implementation:

- find problems and solutions using innovative instruments in commercially torpid sectors;
- the government, business and science must cooperate in choosing priority development areas and following them;
- stimulate technological modernization with tariff, customs, fiscal and anti-monopoly measures and incentives;
- make innovations attractive for professionals and investors;
- transparent funding for R&D;
- use international standards of evaluating efficiency of scientific and educational institutes, innovations companies and the R&D infrastructure;
- improve competition as all-important for innovative behaviour, e.g. in R&D;
- coordinate the budget, fiscal, foreign-trade and other policies for successful development in innovations.

² "Strategy for Innovative Development of the Russian Federation for the period until the year 2020", Ministry of Economic Development of the Russian Federation, Ministry of Education and Science of the Russian Federation, National Research Institute Higher School of Economics. Edited by O.V. Fomichev. Moscow, Higher School of Economics Publishing, 2012. P. 5.

The Strategy avoids a narrow understanding of innovations and innovative development as “mere implementation of R&D projects, studying their results and commercializing them”. The document focuses on quick, clear and effective measures to reform the structure and harmonize the innovations environment as a whole. The Strategy covers all of the main directions of the domestic innovations system rather than aim to solve local, particular issues.

SCENARIOS OF INNOVATIVE DEVELOPMENT

Three roads.

Analyzing the tendencies, risks and possibilities of growth of the Russian economy, the Strategy offers three scenarios of innovative development.

The first, **inertia-driven** scenario is import-oriented and does not include large-scale efforts

to innovate. Government policy under this scenario aims mostly at macroeconomic stability and little is spent on science, innovations and human capital. A low-cost policy towards a comfortable business environment and general organizational help in development of business institutes prevails. The Strategy says this scenario would “lead to a further weakening of the national innovations system and growing dependence on foreign technologies”. This logic of development means that Russia will remain in the tail of western technological achievements and in the future lose to emerging industrial powers. The Strategy considers this scenario “unacceptable”.

The second scenario is **catching-up development and local competitive strengths**. It involves modernizing the economy with imported technologies and stimulating local R&D initiatives. Under this scenario, not just national security and defense but

KEY GOALS OF THE STRATEGY:

- human resource development in science, technology and education;
- a more innovating business and faster growth of new R&D companies;
- maximum informatization of state administration;
- a balanced and stably developing R&D sector;
- opening the national innovation system and the economy to the world and involving Russia in the global technological interplay;
- better innovating efforts in the Federation subjects and municipalities.

PRINCIPLES OF IMPLEMENTATION:

- Holistic use of the development instruments;
- The government mainly “fills up” where the market cannot;
- Stimulating modernization of companies;
- Making innovations attractive professionally and for investors;
- Business and science together set priorities;
- Transparent distribution of funding and assessment of results;
- Efficiency evaluated by international standards;
- Competition in knowledge.



Scenarios of innovative development in the Strategy

- A large-scale modernization of the R&D sector and fundamental science
- Focus on breakthrough-promising fields
- A sharp increase in demand for scientists and engineers
- Creation of an integral innovations system
- Restoration of Russian fundamental science to prominence

Option 3. Achieving leadership in the most important technical fields and fundamental studies

Option 2. Catching up with the leaders and developing local competitive strengths

Option 1. Inertia-driven (import-oriented) technical development

- No strong efforts to innovate
- Focus on macroeconomic stability
- Low expenditure on science, innovations and human capital

The most attractive option
The most expensive option
Significant risks

Harsh competition in this niche
Slowed home research

A technological lag behind Western leaders and in perspective — new industrial powers

a developed energy source sector drive the demand for Russian-made technologies. Fundamental and applied science consolidate around commercially viable industries and products.

The catching-up scenario, exemplified by Japan, South Korea, Malaysia, Singapore and China, involves strong state efforts to modernize R&D with a focus on the most promising venues of development that might sharply increase the applicability of domestic research and improve the country's standing in the global high technology products and services market. If Russia follows this scenario, it might become a leader in such industries as aviation and space technologies, composite materials, development and use of nanotechnologies, biomedical products for human and animal health and protection, atomic and hydrogen energy, some segments of ecological conservation and rational use of natural resources, and certain other fields.

This scenario, if followed, would create a great demand for scientific and engineering personnel and a fully-featured national innovations system with fundamental science returned to its global prominence. The scenario, however, is costly, implying massive state investments in R&D, especially fundamental science, active assistance with commercializing new products, search and creation of new market niches and segments in existing markets and support of Russian companies' entrance there. The radically new approach also has serious investment risks. For example, it is likely that the most promising innovations will be used earlier or more extensively elsewhere.

In a country with diversified industries a model of modernization across the board is not appropriate. Thus, the Strategy determines that for Russia in the present circumstances development with **leadership in particular segments** (where there are or can be quickly created competitive strengths) must be secondary to a **catching-up model for most of the economy**.

STAGES OF IMPLEMENTATION

First stage (2011-2013).

Two stages of implementation are planned. The **first stage** is to make business and the econ-

omy more receptive to innovations. This is to be achieved by making high technology sectors, primarily those specified by the President, attractive for investors. Tax and tariff remissions and other regulative changes and many types of financial support should attract capital and best-qualified workers.

The sectors where Russia in the short term may not hope to lead will be stimulated with favorable taxation for modernizing machinery, good customs terms for importing equipment and higher technical requirements. Encouraging competition and stimulating innovations in state-owned companies and natural monopolies are also planned, with better corporate management and clear demands on innovation for investments (including effective inspections). Hurdles in technical, customs, fiscal etc. regulations preventing innovations need to be removed, state cosponsorship of private innovations grow, the venture financing industry become better regulated and business' cooperation with colleges and scientific institutes develop.

The Strategy's first step is to increase the support from the development institutions to the recently founded innovators and uphold small businesses and specific projects with the resources of the state programs and subprograms for the high technology industries. Mechanisms for a partnership of the state and business, joint goal-setting and financial participation in R&D projects will be developed.

Expected results of the first stage:

- more effective science and education, with funding routed from inefficient to more productive uses and renovation of management;
- effective integration of Russian science into the world scientific community. Creation and development of competences centers with national research hubs and raising some top universities, state scientific institutes and scientific bodies to global levels of competitiveness is a priority. The Strategy includes the science-intensive clusters appearing in the regions in the competences centers.
- start of implementing pilot support mechanisms for large-scale privately owned innovations, e.g. support of clusters and tech platforms.

EXPERT OPINION



“The problem of the Russian innovations market is that the Russian society is by and large not ready for innovation. This passivity is often described as laziness, they say that people want just to spend their evenings watching TV. In practice, people are ready to grow and develop, but all of their initiatives break on the close-minded habits of the mass and the conservatism of those who make decisions. So “once bitten”, they don't try again. They just look for some quiet spot where they can live out the rest of their life in peace.

Russia's youth, on the whole, are much more “advanced” than their peers in the US. But unlike Americans, they don't know how to work in a team. Let us recall the business efforts MIT students make. Their workgroups found companies with an aggregate income higher than the annual budget of Russia, India or Italy. This is because any American student knows that if he tells his teachers or friends about an idea that has fired him up, he won't hear in response “It probably won't work” or “Don't you have anything better to do?”. In Russia, whenever I shared my thoughts about the company I'm now the head of, I heard this sort of remarks all the time.

It's obvious that businessmen themselves must take on spreading innovations-friendly thinking in Russia. Entrepreneurs need to come to schools, colleges, incubators and tell real case stories, their success stories.

Today, there is mainly “methodological” support to encourage creative thinking in young people. So, the idea to set up one's own innovation business is generally regarded as dull and not inspiring.

VIKTOR OSETROV,
FOUNDER OF REALSPEAKER

Russia in ratings and studies

14

2013

*Global
Innovation Quotient*

Calculated for 200 countries. They are rated by rate of patent registration, concentration of researchers, intensity of R&D, volume of investment in R&D etc.

Bloomberg

4
in Europe

2012

*Dow Jones
VentureSource*

Evaluates venture markets by a number of criteria

Wall Street Journal, Heritage Foundation

54 [↑] 32

2007 _____ 2012

*Global
Innovation Index*

Compares countries by degree of innovativeness, taking into consideration supporting ecosystem and output of innovative products.

INSEAD, WIPO

71 [↑] 55

2009 _____ 2013

*Human
Development Index*

Serves as a comprehensive estimate of life expectancy, literacy, level of education and income

UN

124 [↑] 112

2011 _____ 2013

*Doing
Business*

Arranges countries by comfort for business

World Bank, International Finance Corporation

146 [↑] 139

2009 _____ 2013

*Index
of Economic Freedom*

Evaluates national economies by looking at rights and liberties

Wall Street Journal, Heritage Foundation

51 [↓] 67

2008-2009 _____ 2012-2013

*Global
Competitiveness Report*

Evaluates countries' ability to secure prosperity for citizens

The World Economic Forum

31 [↓] 48

2007 _____ 2013

*Globalization
Index*

Shows a country's integration into the global economy

A.T. Kearney / Foreign Policy Magazine

- another priority is restructuring higher education to upgrade the R&D segment of universities, improve their cooperation with leading real economy companies and scientific bodies and integration into the global system of both educational programs and research initiatives, better academic mobility, R&D and educational networking.
- better financial support of leading colleges, scientific communities and individual researchers with world-class achievements.

The Strategy emphasizes the need for a body of competent managers of innovative development in state-owned firms, universities and the government. Another important task is to attract with federal and regional efforts direct foreign capital for high technology industries and exports.

Second stage (2014-2020).

The **second stage** will see greater spending on innovations in the budget. Private financing is expected to grow as well. With the resources so freed from support of business projects education, science and infrastructures (transportation, telecommunications, residential) will be better supplied. The country's industries will be massively modernized, building on the achievements of the first stage. In the main sectors of the economy Russian companies will achieve the average technological level of the developed countries.

Fiscal and other incentives will help replace old industrial equipment. The priority venues of technological development and science, those with potential for global leadership, will continue to receive full funding. Upgrading and completing the innovations infrastructure and improving its efficiency is especially important.

The second stage is expected to result in a comprehensive and operable national innovations system, responding fittingly to growing demand from the economy and supporting innovations from start to finish. Russian innovative goods and services will be actively promoted abroad, funding increased for credits, securities and cofinancing for business. Modernizing science facilities and equipment will be funded in advance

of the need, the development institutions play a greater role in R&D financing, a growing percentage of the state budget will be devoted to civic engineering works and research.

In international scientific projects, resources will be concentrated for a limited number of initiatives and the risks shared. If the innovations center Skolkovo performs successfully, this method

of commercializing research will be extended to other regions. Budget spending will focus more on supporting key technologies and target programs and less on state cofinancing of enterprises.

These are, in outline, the goals and principles of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020. Its first stage will be completed in 2013.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020 — Stages

Firststage (2011-2013)

Making business and the economy as a whole more receptive to innovations

- increase investment appeal of high-technology sectors;
- support “catching-up modernization”;
- develop competition, motivate public companies to innovative action;
- remove barriers to innovations, improve administration quality to the OECD standard;
- proactive growth of co-financing for private innovations projects;
- cooperation of the government and business in setting agendas and financing R&D;
- improving efficiency of science and education, development of college R&D, creation of competences centers;
- pilot projects to support corporate R&D, clusters and technological platforms;
- effective management;
- mechanisms for attracting direct investments in high-technology industries and for supporting innovative exports.

Secondstage

(2014–2020)

Growth of private financing of R&D, significantly more funding for education, science and infrastructure of an innovations-based economy.

- massive technological modernization in manufacturing (to global average level);
- large-scale projects in priority venues;
- completing and upgrading the innovations infrastructure;
- creating a working nation-wide support system for R&D at all project stages;
- expanded innovations exports;
- proactive growth of spending on renovation of scientific personnel and equipment, a system of institutes for management of R&D spending;
- more budget funding for promising technologies with less direct state participation and more off-budget sourcing.

EXPERT OPINION

“Russia’s policy towards an innovations-based, socially oriented economy must, in my opinion, give clear answers to three fundamental questions.

1. What *social* factors, conditions etc. motivate a Russian citizen to innovation?
2. What *economic* factors motivate a Russian citizen to innovation, for example, creating and developing technology companies?
3. What *personal* (inner) factors motivate a Russian citizen to innovation?



Accordingly, the obstacles the economy is now facing on its way to an innovations-based model can be divided into *social*, *economic* and *personal*.

The *social* negative factors are:

- fairly low levels of innovative, entrepreneurial and generally social activity of the population — a historical legacy;
- small proportion of citizens and companies, innovators prepared to commit to difficult objectives;
- lack of faith in the government’s positive involvement and sincere desire to develop the innovations sector;
- lack of widespread knowledge (awareness) about innovative projects already successful, insufficient effort to promote and spread success stories, including stories about global successes.

The *economic* negative factors are:

- dearth of available capital for early start-up stages (pre-seed and seed), traditionally financed on developed markets with household savings and by business angels;
- lack of capital to start or build an innovations business in particular innovation-based economy sectors, new and undeveloped and so involving higher risks;
- lack of low-rate credit for innovations start-ups, large securities demanded;
- limited grant support (complex application procedures, “fear of failure” they inspire) for pre-seed and seed;
- perception of venture risks, especially at re-seed and seed, by many potential innovators as “too high”;
- excessive orientation of most innovations companies to the b2b sector with narrow niches and growth ceilings instead of b2c with potential for mass sales, high efficiency and nation-wide visibility;
- absence of state leverage that would allow well-developed domestic innovations companies to significantly raise their volume of business and globalize it, entering foreign markets and issuing stock on the main domestic and foreign trading floors.

The *personal* negative factors are:

- a low rate of acceptance of risk associated with innovations;
- “state-dependent” mentality, still widespread;
- common preference, even among those qualified to become technological innovators, for a career and business following a most comfortable, risk-free scenario. Corporate employment, work in a state-owned company, a position in the bureaucracy or traditional, non-innovative commerce are more attractive than creating one’s own firm on the frontiers of science, technology and enterprise.
- lack of self-confidence among the creative class, infantile thinking.

Activities designed to reduce the negative impact of the mentioned factors and accelerate the development of the Russian innovative economy can be implemented through the use of financial and non-financial instruments with close collaboration and partnership between the federal and regional public authorities, development institutions, business and society in general.

ROMAN KOSYACHKOV,
CHIEF STRATEGY OFFICER OF RVC

Innovative individual

Nurturing of innovations competences

“Scientific development requires commitment to complete personal freedom, freedom of the individual spirit, because only then can one worldview give place to another, suggested by an unrestrained, autonomous progress of the self”.

*V. I. Vernadsky,
XX century natural scientist, philosopher and social activist*



The main feature of an innovation-driven economy is that it is at all times and in all places powered by individual as the carrier of skills, creativity and business vigor. It is the quality of human capital, rather than the mere availability of an “innovation-supportive” infrastructure and financial resources, that determines success in building a knowledge-driven economy.

One easy way to define “innovation” is in terms of money-knowledge-money. Science is transformation of money into knowledge, and innovation is what appears when knowledge becomes money again. The two processes revolve in a complex cycle of ideas, intellectual properties, financial resources

and competences. Different players are involved in this cycle: the government, business, research institutes, colleges. Maximum effect requires a self-regulating innovations ecosystem with resources to encourage and assist new start-ups and functional, well-balanced exchanges between all the parties. The individual is again at the center of the ecosystem. This is why the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 prioritizes “development of human capital in science, education, technologies and innovations”.

HUMAN POTENTIAL

The individual-centered growth model.

What is he like, this “homo innovaticus”, the staple of an innovations-based economy? Overall the Strategy characterizes him as a highly trained, self-motivated, ambitious team player constantly improving his skills. But the innovative individual needs support from the society at large. He needs to see a positive attitude to inventions and brilliance, tolerance of failure, common in technology business, be able to ride in “social lifts”.

over 1 500

innovative SMB-companies have been created with Russian colleges and research institutes by April 2013

The greatest contributor to making the “innovative individual” is education, which needs to be adequate to the challenges of the time. The Strategy asserts that the Russian educational system needs to be reoriented towards nurturing the skills and competences required for innovations. Modernizing general and professional education involves new teaching methods and technologies helping to continuously promote and perfect creative thinking.

The demand for highly qualified personnel is clearly climbing in Russia and everywhere in the world. Higher and higher demands are being placed on national educational systems, the “factories” of innovation’s most important resource — the human resource.

In 2012 a study program in innovations RVC set up in the autumn 2011 at the Moscow Institute of Physics and Technology (State University) continued to benefit students. It includes a required course for some senior students at the Department of Innovations and High Technologies and an optional selection for students from other departments. The

Development and Launch of a Technological Project (Start-up) course follows a similar program at the MIT and is meant to provide the students with practical know-how of technological project development and launch. Students at the Moscow Institute are coached in setting up a high-technology project, locating funding, putting together business plans for their own projects. The students go through all of the stages of launching an innovations start-up, from formulating an idea to approaching investors. The students in the program, more than 60 in number, combine into 10 project teams (about 90 attend the MIT counterpart).

“Russian companies trying to build a high-technology business face a serious shortage of specialists able to manage scientific projects and research in a business model. Such professionals need to have both extensive knowledge in science and engineering and a wide range of management competences. In the absence of appropriate educational programs, the deficit is system-wide. This is why RVC has offered this program, to fill the market gap”, — says the program’s director and CEO of RVC Igor Agamirzian.

EXPERT OPINION

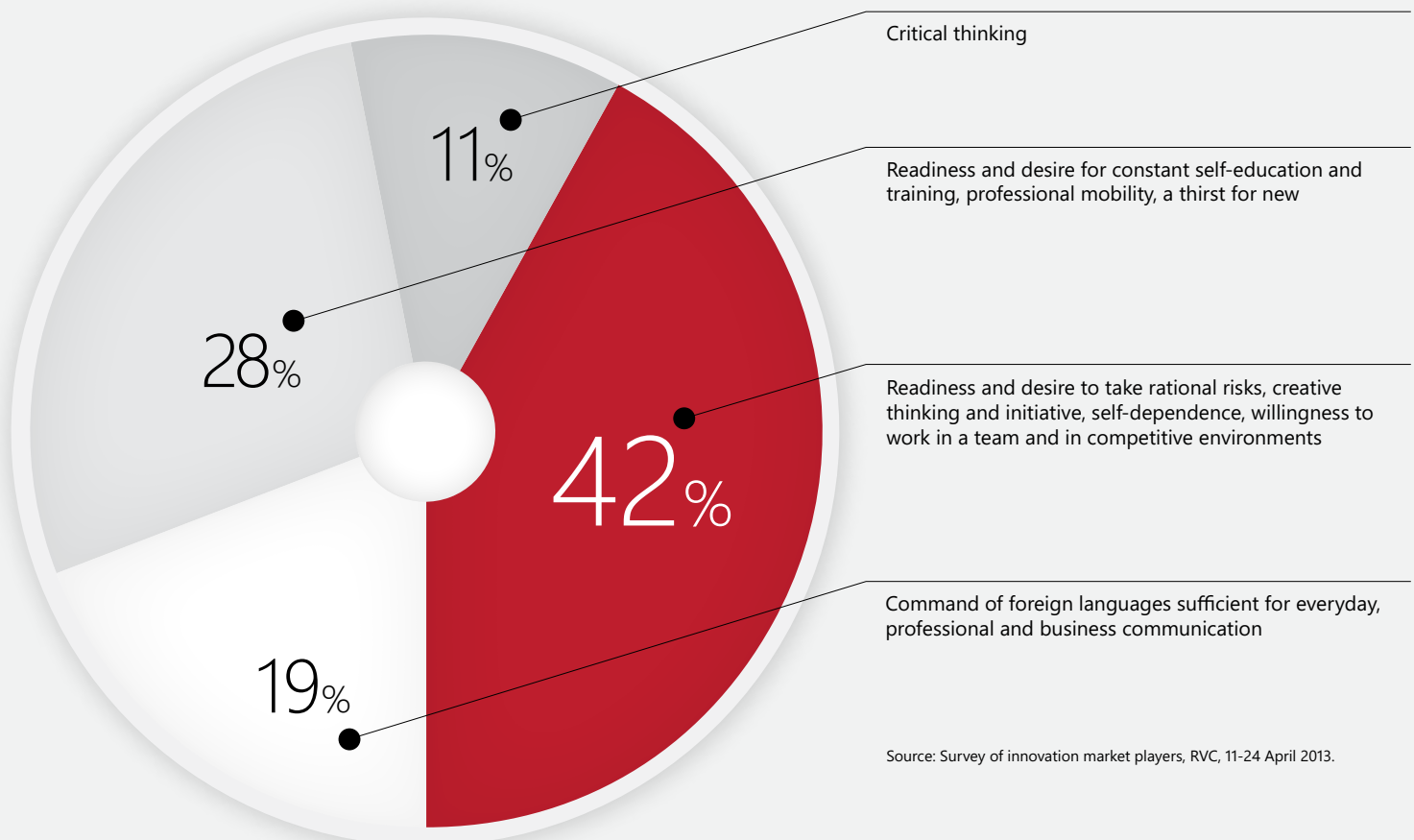


“Supporting institutions of higher education that train technical specialists, especially in mathematics and IT, is important. It’s these higher education institutions that often supply talented businessmen and researchers. Russia has made a strong early effort in the 1970-80s, and we are still reaping the benefits today. But unless we can attract faculty from abroad and educate young teachers at home, maintaining the output of qualified specialists will be difficult.

DAMIAN DOBERSTEIN,
PARTNER OF E.VENTURES
RUSSIA FUND

Which of the competences of an “innovative individual” Russian citizens lack the most?

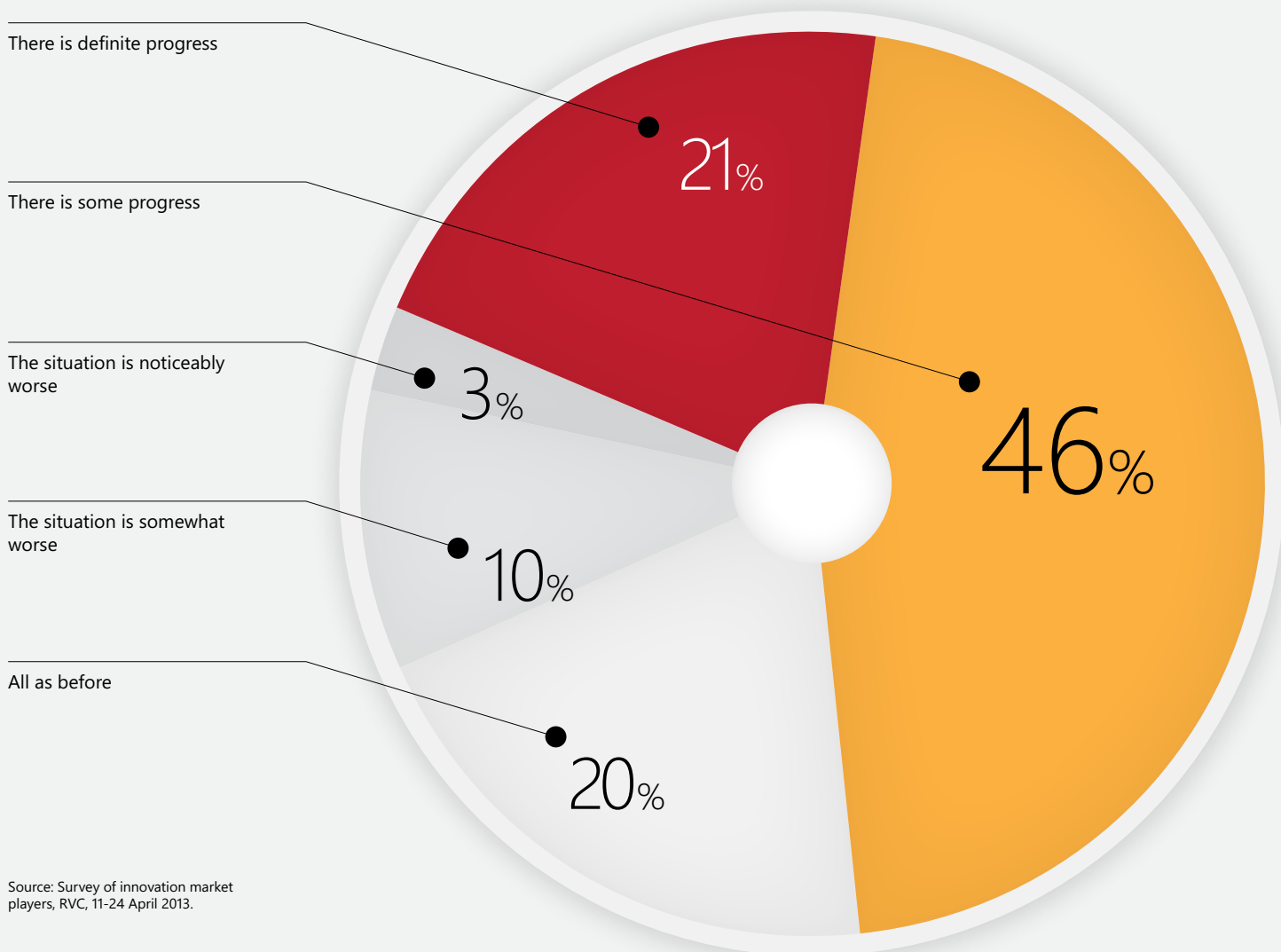
Remarkably, 42% of respondents pointed to entrepreneurial qualities.



Source: Survey of innovation market players, RVC, 11-24 April 2013.

How would you evaluate the last two years' efforts to popularize innovative activity in Russia?

A total of 67% consider the development institutions' and the government's efforts to promote innovation effective.



It is worth remembering that federal law 211, Restructuring of the Russian Corporation of Nanotechnologies, created in 2010 a Fund for Infrastructure and Educational Programs. Its objective is to develop an innovations infrastructure for nanotechnologies and continue the educational and infrastructural initiatives of RUSNANO. The Fund's budget is 29.114 billion rubles. Its most important task is to develop human capital for the nano sector. The Fund implements training programs on orders from nanotechnology companies. By March 2013 90 such programs have been created, with 2,280

participants. The Fund also helped in 2011 to create a technological innovations study program for the Moscow Institute of Physics and Technology. Headed by the Chairman of the Board of Directors of RUSNANO, Anatoly Chubais, it continued its work in 2012. Another initiative in education is e-learning programs and creating professional standards for the nano industry. The "School League of RUSNANO" project addresses the need for improved instruction in the natural sciences at secondary schools. By the first quarter of 2013, the League included 54 schools.

The educational system is responding to the demand for specialists in innovations business and technology management. 2012 saw such programs as Innovation Studies, Innovations Management, High Technology Management. Future businessmen study for their Master's degrees in the Management of Knowledge-Intensive Industries program.

Spreading high-technology and innovations management courses is made possible with involvement of prospective employers in the variable part of the program. This allows them to customize in many ways the competences they receive with the graduates.

College students choose technology business.

Another important task for the innovations ecosystem in Russia is to develop entrepreneurial competences of those who have begun or intend to begin a career in high-technology business. Students and scientists generate an enormous number of ideas for R&D. They often complain of being unable to find investors or funding. At the same time, Russia's business angels and venture investors point to a lack of interesting projects. There is no contradiction here: researchers often lack business competences for the economic side of the project, cannot find the right way to commercialize the technology and make it presentable to an investor.

Transfer of skills, training and practice are the three ways of forming competences. The National Association for Innovations and Information Technologies has published a study of trends in the Russian innovations sector in 2012, with special notice of new programs in innovations-oriented higher education institutions. Their project-based or constructivist approach requires both students and teachers to participate in real projects of the leading innovations companies and encourage creative thinking. Moscow State University, Moscow Institute of Physics and Technology, Moscow Institute of Steel and Alloys and a number of other Russian universities are actively developing such programs.

In 2009, even before the Strategy was accepted, federal law 217¹ had allowed research institutes and higher education institutions to take part in the creation of business enterprises to integrate scientific

¹ Federal Law Business Ventures by Public Scientific and Educational Institutions. Signed by the President of the Russian Federation on August 2, 2009.

EXPERT OPINION

“Russia is lacking entrepreneurial values. And that is its main problem. You can feel it among MBA graduates or CEOs. Most players in the Russian economy, and the Russian people overall, live day by day. There is a habit of sticking to quick tactics instead of strategic decisions. We want a large pay-off today, we don't care for benefits 15 or 20 years in the future. A lot of the people joining my company don't care about “long-term” development. They want to be able to say now: “I've worked in an innovations company”, get a nice point for the resume, earn a good salary. All the while they are already thinking of vacating the country. This attitude is very common and it won't make Russia what it wants to be — a modern nation, a competitive player on the global innovations market. Yes, there are people in Russia who can generate interesting ideas, stay awake the nights to change the world. But the trick with the innovations business is “packaging”. The enthusiasts can't think through an agenda, build the right business model, invent the marketing. This could be corrected by actively training a new generation of innovators. We need to create leaders united by a common value system, who can help develop their regions and the country as a whole. We need international programs to attract both tech specialists and the best abstract thinkers from abroad to fill those lacunas. Eventually they'd be able to pool together their efforts and spread the innovations mentality nation-wide.



ARMAN GUKASYAN,
FOUNDER AND CEO OF VIZERRA PROJECT

ic results by investing intellectual capital. Until this law's acceptance, Russia had had no effective legal means of transferring technologies from research to commerce. Business had been barred from access to budget-funded research, and vice versa. Most research institutes and higher education institutions earned nothing from the intellectual properties they created, with the exception of selling non-exclusive use licenses or R&D subcontracts. It is no surprise that before law 217 came about, patent registration and use had been on the decline among public institutions. The Russian Agency for Patents and Trademarks estimates that in 2005 the share of research institutes, design bureaus and higher education institutions in the volume of patent licensing amounted to a modest 8.3%. It dropped to 7.6% in 2008, showing a weakening ability to commercialize. In 2009 research institutes, design bureaus and higher education institutions began to recover, with their share in patents reaching: in 2009 — 8.9%, in 2010 — 13.8%, in 2011 — 16.25%, in 2012 — 19.93%.

By March 30, 2013, there were more than 1,500 registered small innovative businesses² created with

² Data from the Registry of ventures created by scientific and educational institutions. Created as per Order 718 of the Ministry of Education and Science of Russia, December 8, 2009. Maintained by the Center for Science Research and Statistics (www.csr.ru/reestr).

A SUCCESS STORY

Optosense

INNOVATIVE PRODUCT

A new generation of optical sensors that allow to determine gas concentration by analyzing discrete absorption of infrared light of certain wavelengths. Usable, for instance, to detect volatile gases.



INVESTORS

RUSNANO (209 million roubles), RE Complex Systems

INVESTMENT OUTCOME

Start of serial production, entering into foreign markets

The unique technology behind Optosense's product has taken 15 years to perfect. In the middle of the 1990s companies IKO and EMI banded together for a common R&D project — creation of a new generation of sensors for volatile gases. They began work on first prototypes of optical infrared detectors of methane and other carbohydrates.

Putting a product to market as early as 1996, they until 2005 relied on their own resources. But when a need to switch from piece-production to serial manufacture made itself felt, investors — RE Complex Systems and RUSNANO — joined the project.

In 2011 Optosense opened in St. Petersburg a new production line for manufacture of optical components, necessary for the sensors, which allowed Optosense to begin making as many as 120 thousand a year. In Spring 2012 Optosense began supplying sensors for portable gas analyzing equipment of the American Gas Clip Technologies. Optosense makes one of the main elements of these new devices — a low-energy sensor that allows detecting hazardous concentrations of methane of other gaseous

carbohydrates. It is this sensor that allowed the host devices to show unprecedented performance.

The company's sensors are fast, long-lived and durable, can work in a broad range of temperatures and concentrations. They operate in high humidity and anoxic environment, being noted for low power consumption. Such unique characteristics secure the sensors a quickly growing demand in the domestic and international markets. They can be put to a variety of uses. The sensors are installed in personnel protective devices in coal, oil and gas production and refining. They can be found working in the energy and residential sectors (on gas power stations and in boiler rooms). They protect technicians assembling and repairing underground telecommunications networks.

At the moment, around 100 international and Russian makers of gas-analyzers buy sensors from the company, using them in current products or models under development or certification. 90% of the output is sold to the United States and Europe.

the involvement of research institutes and higher education institutions under law 217. For undergraduate and graduate students, faculty and research workers such companies are one way to commercialize and make practical their findings and acquire business competences.

Advanced training

An innovations-based economy is distinguished by a system of constant re-education, allowing an ongoing improvement of competences. The first stage of the Strategy involved advanced training programs and internships for industrial professionals, development of corporate and sector-specific centers for re-education and agencies of certification and standardization.

Some of these were carried out in 2012 under the Presidential program for advanced training in engineering 2012-2014, approved by the Presidential order 594 of May 7, 2012. 164 education programs in 51 training institutes were chosen in a competitive selection of programs for re-education of engineers. According to the results of the monitoring of the implementation of engineers re-education programs, 5,203 attended the programs, with 1,265 sent on internships to research and engineering centers within Russia, 484 — abroad. In 2013 the Presidential program will benefit at least 5,000 engineers, with 350 million rubles set aside for this purpose out of the federal budget. 50% of the expenses will be contributed by the employing companies and real economy business under the co-financing stipulation.

Acting on the orders of the President and the government and following the decisions of the Military-Industrial Commission, the Ministry of Industry and Trade of Russia will also provide a series of measures to improve professional instruction in the military-industrial sector. These include:

- Commission and Ministry-approved (by order 256 of April 13, 2009) Multilevel Continuous Training Strategy for the Military-Industrial Sector. It purports to provide modern supplementary education to professionals — managers, specialists and workers, create conditions for efficient human capital development in the sector;
- a state program of researcher and specialist training for military-industrial organizations 2011-2015, approved by government order 421 on July 9, 2010;

- ongoing work under the federal target program Development of the Military-Industrial Complex, aimed at providing supplementary education in the industry with a legal framework and infrastructure.

The system of continuous training continued advancing in 2012 as part of the implementation of programs for development of Russia's leading universities and higher education institution strategic development programs as both a guiding principle and part of the Federal target program in education 2011-2015. The concept of continuous training is being developed, and so are systems for independent control of educational quality — appraisal and certification of credentials and independent social (professional) accreditation of curricula.

Changing the public opinion

Popularizing scientific, research and innovative activities follows point 6 of the Presidential task list 3291 (November 3, 2011) and the October 26, 2011 meeting of the Presidential Commission on Modernization and Technological Development of Russia's Economy.

Instituting national awards for the best innovative consumer product, breakthrough technology improving the quality of the human life, expansion to foreign markets was suggested as a way to boost the appeal of research and innovations. Using an existing award as a base for the new national was offered as an option. In 2012 the management of the Moscow Open Innovation forum decided to host from 2013 onwards the final award ceremonies of the Information Technology Business competition, the Tech Success-2013 rating and the RUS-NANOPRIZE 2013 award. Information Technology Business is Russia's largest (in terms of the number of participants) competition in the field of innovations, meant to further a culture of R&D entrepreneurship. RVC is its main organizer. Tech Success is a public, nation-wide rating of Russian high-technology companies that show good development speeds. The rating has been assigned since 2012 on an initiative of the development institutions. These awards might eventually receive the national status.

However, the Interagency Commission on Implementation of the Strategy, created by the Pres-

Russian colleges: international ranking

6 russian colleges placed in Top-500 QS World University Ranking

College	Place
Lomonosov Moscow State University	116
St. Petersburg State University	253
Bauman Moscow State Technical University	352
Moscow State Institute for International Relations (MGIMO)	367
Novosibirsk State University	371
Ural Federal Univerisity	(451–500)

Note: the ranking arranges colleges by reputation in the academic community and among employers, citation index, proportion of foreign faculty and students, student to faculty ratio etc.
Source: QS World University Rankings 2012/2013.

EXPERT OPINION

“Russia's system of primary higher professional education, unfortunately, cannot compete with the top-tier countries. It isn't suited to make entrepreneurs, innovation-oriented specialists. There are some changes for the better, but all of the Bachelor and Master-level programs we have are lagging behind market demands, in innovations included. Higher education institutions are, after all, conservative structures, not to be changed with one sweeping reform. This is why the best higher education institutions involved with innovations (New School of Economics, Moscow State University, Moscow Institute of Physics and Technology, Bauman Moscow State Technical University) have optional programs for students. But it's just the schools' initiatives. These courses don't “have” to be taken for a degree. The optional programs are not enough to give Russia a class of people ready to do business in innovations.



If we look at higher education after the primary — Master's, secondary higher or supplementary, business courses, programs teaching the basics of running a business, e.g. for incubator companies or at the Digital October center in Moscow — we can see that they cover the market needs in particular spots, but mostly in IT. There is practically no college that teaches to actually work with innovations, for example, industrial innovations. We have in New School courses for directors of R&D or directors of research for large industrial companies, but these are very much exceptions. In the whole country there are literally ten people attending such courses. This isn't mass education.

So it might make sense to relax program standards for certain higher education institutions. Today's educational standards are very stringent. It's very difficult to put together a supplementary education program for 72 class hours or so. First it must be accredited and verified for its conformity to the state standards. It might be reasonable to give the school some breathing space, away from the state educational programs. Then it could create its own courses, programs that fit market needs. Educational programs right now are updated once or twice a year, the market races far ahead of them.

NATALIA FEDOTOVA,
HEAD OF BUSINESS INCUBATOR OF NATIONAL RESEARCH UNIVERSITY – HIGHER SCHOOL OF ECONOMICS (HSE)



Over 5,000 guests attended the Forum.



Chairman of the Government D. A. Medvedev attended the first day of the Open Innovation forum.



The Forum demonstrated coordinated work of the development institutions. Photo: S.G. Polyakov, CEO of the Foundation for Assistance to Small Innovative Enterprises in Science and Technology, and I. R. Agamirzian, Chairman of the Board of Directors and CEO of RVC.



The Forum brought together leading international experts on innovations business. Photo: Sir Richard Branson, founder of Virgin and Virgin Galactic, Esther Dyson, Chairman of the Board of Directors of EDventure Holdings.

idental Council for Economic Modernisation and Innovative Development, pointed at the February 28, 2013 meeting to a need for a comprehensive approach to promoting innovation, research and technology. In response to this, several government bodies and an Innovation Promotion work group were tasked with creating no later than June 15, 2013 a program to coordinate promotional efforts, define purposes and suggest initiatives and standards of evaluation.

The time and the place: every year at Open Innovation forum.

The international Open Innovation forum in Moscow is expected to be one of this year's most important events. The first meeting of the forum, established by an order of the government, was held between October 31 and November 3, 2012, and saw more than 5 thousand participants from 42 regions of Russia and 38 countries. More than 700 speakers from 30 countries participated in over 150 events of the official, special and young-adults programs. The Forum was attended by representatives from the government of Moscow, the Chamber of Commerce and Industry and all of the main development institutions. It was funded completely by the organizers and with attracted funds.

The Forum was distinguished by presence of high-ranking speakers and officials. Never before in Russia have representatives of all of the development institutions gathered to meet such a number of international experts on the innovations business. Chairman of the Government Dmitry Medvedev and other important guests were present for the first day.

Open Innovation Expo spanned an area of 22,000 square meters and presented audiences with over a thousand cutting-edge technologies from 16 countries — Austria, Great Britain, Germany, Denmark, Iran, Canada, South Korea, the United States, Thailand, Finland, France, the Czech Republic, Switzerland, Japan, the Netherlands and Bulgaria. More than 500 companies showcased their products and over 10,000 attended the exhibition.

The Forum resulted in more than 20 agreements between the largest Russian and international companies.

In 2013 Open Innovation will be held from October 31 to November 2 in Moscow's Crocus Expo center.

IT SPECIALIST TRAINING COLLABORATION OF BUSINESS AND EDUCATION

IT: engineering growth.

The information technology market is a good example of the importance high-quality, profile education has both for companies in search of staff and for responding to global technological challenges.

The Information & Computer Technologies Industry Association (APKIT) studied, with help from McKinsey & Company³, the state of the IT industry in 2012. The results show the IT sector to be a potential great asset in making Russian companies more competitive in several ways.

First, IT can help integrate Russia into the global technological process. This would require using the scientific and engineering resources in place as a base for innovative IT products and services, resulting in contributions to the GDP and export yields and more employment for highly trained workers. Developing key IT competences advances Russia's national security interests and adds to international clout.

Second, IT innovations can improve productivity in the sectors of the economy with a high capacity for information technologies and hasten economic growth.

Third, the public sector can be brought to new standards of efficiency. Quality of IT personnel translates directly into innovation for the economy and better state services.

Human resources for IT

The Russian educational system has made obvious progress in the training of IT professionals. Russia is estimated to have the third-largest reserves of human resources potentially available for IT. But this mass of graduates is still far from being immediately useful in the industry. In 2010 only 15% of graduates in engineering were equal to their professional responsibilities without extra training or re-education. At the time 25% of IT personnel in India were immediately qualified, in the Czech Republic 40%, in Hungary and Romania 45%.

3 "IT industry development in the Russian Federation. The view of the business community. A report by AP KIT and McKinsey & Company". Moscow, November 2012. (AP KIT. URL: http://www.apkit.ru/files/Strategy_APKIT_2012_vr.pdf (accessed on 30.04.2013).

EXPERT OPINION

“The average Russian, like the average American, probably can't and doesn't have to become "innovative". Most people, wherever they live, are fairly conservative in day-to-day life. What innovations-based economies do is allow an innovative minority to carry out its ideas. And whether these people can be successful largely depends on the demand for innovations. If no one really needs them, the trailblazers will at best move somewhere they can find response. Competition is the most natural force creating demand for innovations. Wanting to become better, people and companies invent various ways to get what they need. This creates innovations and demand for them.



For this reason, Russia must do all it can to facilitate competition. With competition, there will be a need for innovations. That is the way to change, not with forums and conferences.

Given competition and, therefore, demand, the educational system would be able to help innovations development a great deal. The project-training programs that Russia's "advanced" higher education institutions are struggling to implement are already a past stage in the world. Developing profile competences is the new trend in educational approaches. The Russian education system, on the other hand, offers corporations workers who lag two-three years behind graduates from good foreign schools. With conditions like this an innovations-based economy is, to say the least, difficult to make. My conclusion is, for Russia to have an innovations-based economy, it's these two institutes, competition and education, that need the most overhauling.

ILYA SLUTSKY,
MANAGING PARTNER OF ASTEROS CONSULTING

AP KIT estimates that Russian colleges produce at least 60,000 IT specialists every year, with the market demand around 75,000.

According to RUSSOFT Association, IT professionals fresh out of a Russian college still find easier employment with companies oriented at domestic demand than with the export-oriented. The reason is higher professional and lingual requirements of exporters. Russian IT companies with more than 50% of income coming from exports employ 2.8% of recent graduates, those with less than 50% employ 7.4%⁴.

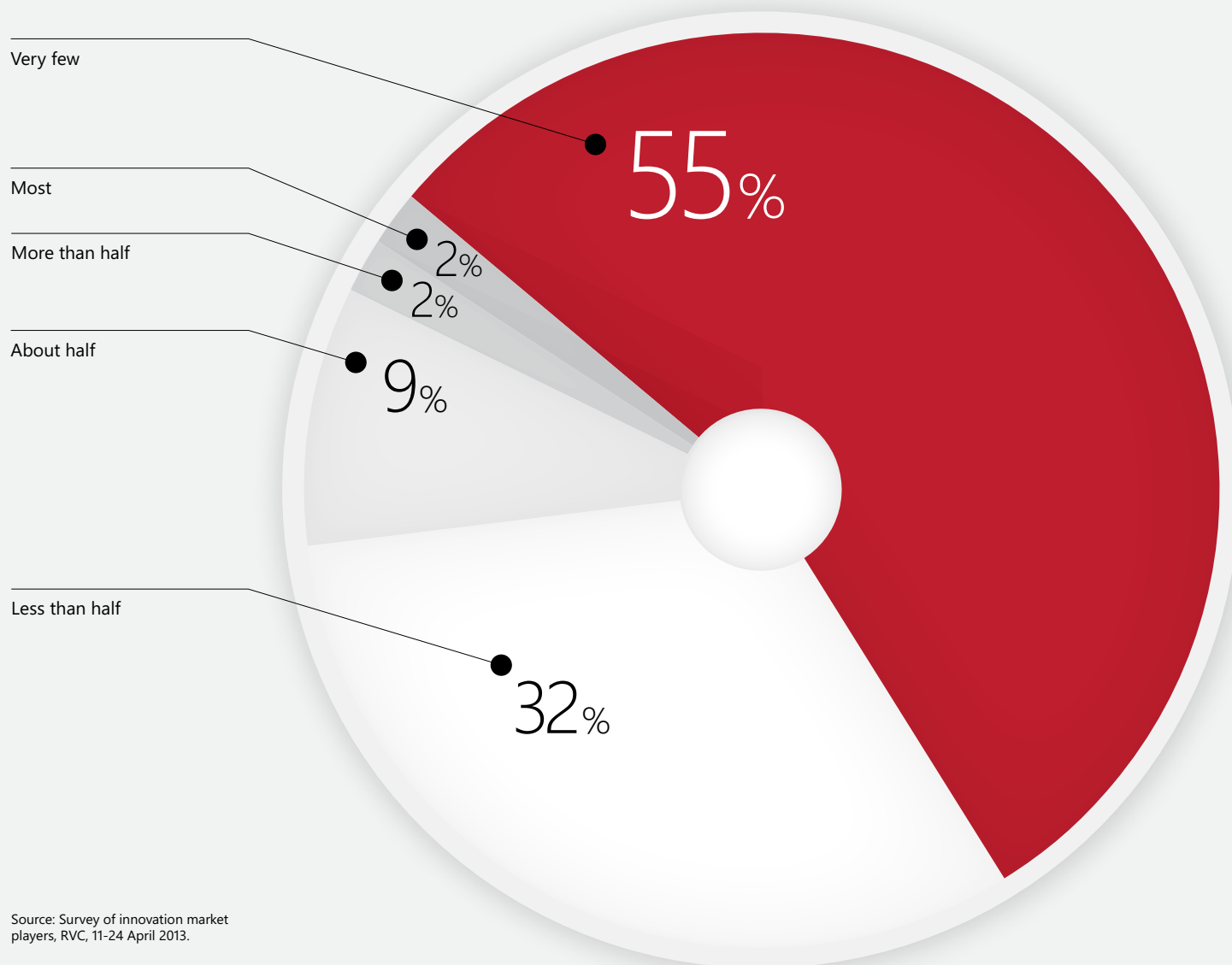
"Regional colleges in particular, although many offer excellent instruction in mathematics and technical disciplines, need better language programs to provide their students with a competitive profile", RUSSOFT's study says.

Popularizing technical disciplines for the innovations business remains important. In the last few years the quality of Russian engineers has fallen into the "demographic hole" with the numbers of high school graduates, the country's population hit by the low birth rates of the 1990s. As the study says, "Less and less competitive enrollment in technical colleges has been the result. Admittance has be-

4 "Russian export software development industry. Ninth annual review. With participation by AP KIT". RUSSOFT Association, 2012. (RUSSOFT. URL: http://www.russoft.ru/files/RUSSOFT_Survey_9_ru.pdf (accessed on 30.04.2013). With participation by AP KIT.

How many Russian scientists and educators have the competences of an “innovative individual”?

55% of the respondents said that only very few have such competences. This is entirely in agreement with other studies showing that science and education in the country still cannot support the rate of growth of Russian innovations as a whole.



come easier, dismissal less of a threat. Both the colleges and the young people have fewer incentives to push their education level”.

Another unsolved problem is very weak representation of Russian technical schools in international ratings and the low rankings of Russian universities in such studies.

Independent research finds **positive changes** in education, reflecting the effect of measures implemented under the Strategy.

According to the “Russian export software development industry” report, the ranks of well-qualified engineers are now swelling thanks to specialized programs of leading IT companies at top-tier colleges and paid supplementary training offered by industrial leaders and the Russian IT sector.

A career in programming is becoming more prestigious because of better salaries (30-50% higher for software development engineers than for engineers in other fields and at least twice the average

salary in Russia as a whole). State-sponsored enrollment for IT students is markedly more available.

IT market players admit⁵ the government is doing its best to improve the quality of personnel. One example of this is acceptance at the end of 2011 of a list of study concentrations for colleges and research institutes that follows the Russian economic agenda. It offers around 100 choices with about a third IT-related. Starting in 2012, students and scientists choosing to concentrate in high-priority subjects are eligible for Presidential and governmental scholarships, substantial by Russian standards.

The Ministry of Education and Science has established a three-year program for re-education of engineers. At least 15,000 will be trained. This program is funded as a public-private partnership. The Ministry is committed to underwriting up to 50% of employers' staff improvement costs. \$6 to 11 million of budget funds will be allocated to the program every year. Re-education at centers within Russia can be complemented with foreign internships. There are similar initiatives ongoing or being prepared in the regions.

Already in 2012 Russian companies were relieved somewhat from poaching each other's IT specialists by a greater availability of college trainees. This indicates indirect approval of the government's modernizing efforts among market players and employers.

A 2012 survey of the Russian IT market by RUSOFT Association has produced some results relevant for the Strategy's success. The study did not find a statistically significant increase in the number of companies collaborating with colleges. To quote, "Even large foreign corporations find cooperating and even getting in touch with big-city colleges a challenge. The top-tier schools have stopped welcoming any large employer that comes along, because their alumni are already heavily recruited". A survey by Career.Ru confirms these findings. 30% of companies working with colleges or universities find them reluctant to respond. 49% think the process of setting up collaboration itself is very cumbersome, 38% say they struggle to find instructors for inexperienced alumni.

It is evident that the educational system and Russia's leading technology companies, the Ministry and the development institutions should during the Strategy's second stage focus on finding and disseminating better methods of cooperation between education and business. Of course, it's important to distinguish in such unions employers' staffing desires from actual concern for social improvement.

Working for results

The RUSOFT study already quoted points to an improvement in the state funding for Russia's best technical colleges. For example, they have received grants for inviting distinguished foreign teachers.

EXPERT OPINION

“I mean lack of trust in the government among the innovators. Many start their companies outside Russia and afterwards open only branch offices here. Then they might, for example, go to Skolkovo for grants, open a Russian-registered representative office just to qualify for residency there. This sort of thing means distrust is still a factor. Considering that the Russian market is small as it is, about 1-3% of the global, it's easy to see why start-ups often want to go elsewhere.



The other big problem is lack of demand for innovation companies and their products from the big players. There are next to zero acquisitions of Russian innovation companies. Only a few companies are sold every year, with a lot of hoopla, and the size of the deals is... not so impressive. The "Big Three" in telecom and the Internet giants prefer to grow with their own research instead of buying companies. When will the corporations turn to the open innovations model? In five years' time, at the soonest.

Fresh competition between large Russian and foreign companies might help. Then our heavyweights would have to boost growth, and that can be done by buying ready-made, working businesses.

The state, too, needs to pay more attention to the environment for innovations. This is what the development institutions set up in Russia are working on. There are some well thought-out initiatives in Moscow and the regions. We are seeing more than an emerging layer of businessmen in innovations. An infrastructure is shaping up, and most importantly, ecosystems for businessmen to learn and get experience. This will make corporations learn also, become interested in things like corporate venture funds, different growth models. The government can't stimulate corporate demand for start-ups directly. But it can invest in education for the corporate and business environment. And that counts.

It's also important for the state to build up a strong fundamental science and applied science. We won't have good ideas for start-ups without subject knowledge. This makes raising efficiency of science one of the most important goals for the state. Science needs investments — this is money spent on future generations. But we need to remember that investing now will pay off only in 15-20 years for fundamental science, in 5-15 years for applied. Properly conducted research takes patience. We are short of that.

I hope the government will learn to distinguish between "develop" and "make". Those are two different things. "Developed" things bring more profits than "made" ones. For example, assembly of one iPhone device costs \$5. The entire production cycle expense is about \$60-80. But the selling price is hundreds of dollars. Whoever has developed a breakthrough products and has the rights to it, gets the biggest pay-off. Where and how the product is actually "made" is not so important. You can set up production anywhere. This is something that our government still has problems in understanding. We are too used to building pipes and factories, with thousands of people every day going to those factories. But the world is changing. We need to direct our efforts to creating intellectual property and game-changing mechanisms of putting ideas on the market.

ALEXANDER GALITSKY,
MANAGING PARTNER OF ALMAZ CAPITAL

5 See: "Russian export software development industry".

“And judging by the achievements of Russian students and alumni, the quality of instruction is still on par with foreign colleges”, adds the study. This is in part because of a gradually decreasing level of instruction in IT in most world countries.

EXPERT OPINION

“An infrastructure to support the innovations business in Russia still doesn't exist. The day the government can say “Everything an innovations business needs is here and working” will be the time to discuss what has been achieved and what hasn't.

What should the government do to make the environment more receptive to innovation projects? I can think of four things.

1. Bring back the Soviet free education system. Make it the way it used to be: if you have the ability, you can study anywhere, if you don't, somewhere.
2. Include experienced managers in college administrations. College governing bodies right now aren't oriented at real market demand, and that creates a wide gap between alumni with diplomas no one needs and potential employers anxious for young qualified specialists.
3. Have a real program to support business instead of raising taxes and loan interest rates.
4. Supply innovations companies with state orders. Supply innovations companies with state orders. This will help companies kick off faster and the government will benefit from better efficiency from new product solutions.

If we want something other than the commodity-driven business to develop in this country, we need to do everything we can not to choke the innovators. This applies not only to start-ups, but also to active companies. Many are familiar with the “Nokia wonder” and know how a free, market-driven education, tax remissions, low-interest credit and state orders helped create a superstrong telecommunications cluster in Finland. For many years Nokia became a leader of the mobile phone market. (It's been displaced by others since then, but that's a management problem.) Start-ups do need money, too, but depending on production type, time to self-recoupment and other factors the amount may vary a lot.



MAXIM KAMANIN,
FOUNDER OF DISPLAIR

EXPERT OPINION

“The larger Russian companies are beginning to understand that if they want to expand to foreign markets, they must become more innovative.

They realize innovations are needed for survival, but they must be able to finance new technologies with money from an open market. Russia isn't very far along this road. Research and big companies' demand don't “mesh”. What's needed is technology transfer.

We often ask institute scientists why they are doing research, what goals they are following. And I very often find that nothing has changed in the few years Russia has been on the innovations track. There is next to no commercial demand for innovations in the country. And researchers are just afraid to take to the market what may not sell. This is why people here don't believe the chances to succeed are good.

In the Skolkovo Startup Academy I've chaired meetings between promising scientists who have come up with interesting technologies and managers or MBA students who feel like founding a start-up and are looking for new ideas. That was a kind of speed dating. Managers could meet the scientists, the scientists could explain what they've done to potential co-founders, the students could right there give advice on running a business. I think we need more formats like this. It's a way to connect researchers and businessmen who don't always have the technical knowledge, but could be great partners and help a product to market.



LAWRENCE WRIGHT,
DIRECTOR OF SKOLKOVO STARTUP ACADEMY

A number of problems in Russia's higher education certainly remain. Many experts say in this regard that constructive criticism should not detract from the image of the Russian educational system as a whole and its global standing. In addition, some indicators are ambiguous. For example, the RUSSOFT study suggests a considered view of international school ratings and Russia's modest place there. “The main reason for the low rankings”, it says, “is that Russian colleges have yet to learn to work with rating agencies, who are still badly informed about higher education in the country. This makes comparing Russian and foreign colleges by the main performance statistics difficult”.

In a few specialized ratings Russian colleges actually score the highest. For example, students of St. Petersburg National Research University of Information Technologies, Mechanics and Optics have shown the best average results for the last ten years in the ACM International Collegiate Programming Contest. A few other Russian schools are in that competition's Top 20.

The Russian teams overall again did well in the 2012 International Collegiate Programming Contest in Poland, according to the Computer Manufacturers Association. The team from the St. Petersburg National Research University became an undisputed champion. The school has won the world championship in programming a record four times. The 12 top teams in 2012 included Moscow Institute of Physics and Technology with an undisputed 3rd place and Moscow Institute of Physics and Technology with the 10th.

The teams of five other Russian colleges also showed good results in the last world championship in programming. Russian students have twice taken the Facebook Hacker Cup. A student from Tyumen State University, Sergey Glazunov, was the first to find vulnerabilities in Google's Chrome browser and received the grand prix.

“Champions in competitive programming don't always show the same brilliance in practical work for a company or a government structure”, stresses the RUSSOFT study. “But they are usually up to the most challenging tasks at the workplace. Many Russian ACM winners have created successful software companies or work for them (DevExperts, SPb Software, Yota, VKontakte)”.

Higher education

Experts' recommendations

Expert interviews with players on the Russian innovations market have resulted in a number of suggestions and recommendations for forming competences under the Strategy for Innovative Development of the Russian Federation for the period until the year 2020. The experts proposed to focus on the following.

1. Modernization of the national system of higher education to provide world-class skills and knowledges in every field and discipline.
2. Assistance in helping the Russian educational system switch decisively from an inertia-driven, "catching up" model to a forward-looking and competitive one. Alumni's success in the innovations business could become a major performance indicator for higher education institutions. On the whole, higher education must not only consider the current or past demand for human capital, but also create workers capable of creating fresh technologies, goods, services, solutions and entire new market segments.
3. Continued development of a support infrastructure for innovations, instruments for re-education and improved instruction in management to benefit college graduates, engineers, researchers and developers.
4. Active introduction of innovative environments to higher education institutions, supplying young specialists with the organizational and financial assets to make their first steps towards an innovations business while still studying and learn how to commercialize and "package" ideas.
5. College boards of directors and faculty lists must include more managers and businessmen with sound expertise in high technology and innovations.
6. More special-purpose programs, sponsored by large corporations and development institutions, for the country's leading higher education institutions; supplementary education programs set up by Russian and foreign high-technology business.
7. Identification and active use of best practices in higher education/business interaction. Correction of various kinds of bias, e.g. companies' attempts to satisfy their staffing needs under the guise of collaboration with higher education.
8. A substantial increase in the proportion of graduates qualified for immediate market employment.
9. In the situation of globalizing technological markets, extensive foreign language instruction for technical colleges, especially in the regions.
10. Constructive criticism of the system of higher education balanced with care for Russia's positive image.
11. Creation of a positive perception of businessmen in general and promoting the innovations business as one of the main venues of social, economic and personal achievement.
12. Popularizing key entrepreneurial qualities — desire and ability to build a business, take on risks.
13. Restoration of a high status of science, research and invention as important parts of an innovative lifestyle across all industries and professions.
14. A broader and more sensitive system of talent search.
15. Using media and other global assets, broad advertisement of the true achievements of the Russian educational system. More vigorous promotion of colleges' successes and students' performance in international competitions.
16. Transparent, give-and-take relationships with foreign rating agencies in education.
17. Active joint efforts by the educational system, business, development institutions and the government to improve the quality of specialists vital for an innovations-based economy. This includes IT professionals in view of the fact that information technologies have evolved from just another "industry" to a platform for a number of other technical venues and market segments.
18. Appropriating the experience of successful collaboration between colleges, scientific institutions and business abroad, continuation of the best traditions of the domestic educational system.
19. Closer attention to professional training for technical specialists and managers, improved "innovative individual" competences for students and graduates.
20. Incentives to research factors both promoting and preventing innovation among Russian citizens. Based on the findings, a system of indicators to measure the effect of development instruments in use would be useful.

Overall, the study showed that creating economic, social and personal conditions for innovation country-wide could be extremely valuable for proliferation of "innovative individual" competences and an important focus of state efforts.

Innovative business

“The wealth of a nation grows faster than its population because of the rapid progress of the natural sciences and their ever wider industrial application”.

*S.Y. Witte,
eminent XIX-XX century Russian statesman*



Global experience shows: in most countries business is the foremost consumer of innovations. R&D expenditures of OECD nations are on average 65-70% corporate-funded. For comparison, a little over 20% of Russia's total investments in science and research in 2010 came from commercial sources, according to Expert RA. Top Russian companies invested an average of 0.2% of their annual revenues in innovations; the figure was 2-3% for most foreign companies, and for the technological leaders as high as 3.5%.

This goes well to illustrate Russian business' innovative languor.

The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 stresses the fact that, despite a series of important earlier policy-driven attempts at motivation, progress has been checkered. The Strategy points out to such obstacles as unsatisfying quality of the business environment, substandard investment climate, lack of conditions for fair competition and equitable distribution of funding, poor cooperation between business and the state in planning and carrying out R&D-supportive measures, barriers, still high, to a wider circulation of new technologies in the economy — because of deficiencies in industry admin-

istration, fiscal and customs procedures. In view of this the Strategy identifies two main venues for application of efforts: one is creating an environment favorable to innovation, the other stimulating the real economy to innovation, modernizing its production base.

STIMULATION OF INNOVATIONS AT EXISTING COMPANIES AND SUPPORT OF R&D START-UPS

Creation and early results of innovations development programs for large-size state-owned companies.

The Strategy's first stage (2011-2013) prioritizes such support measures as “direct administrative stimulation of large-size companies in the public sector and natural monopolies to create and implement innovation-oriented programs”.

By April 2013, 60 largest state-owned firms have begun implementing their programs of innovative development (PID). 47 had had them approved by the Ministry of Economic Development and industry administrations in 2011, 13 in 2012.

Most of the programs are for 5 to 7 years and follow the priorities of the state modernization ef-

fort. 22 of the programs, complying with Government Task РД-П7-927 of 15 February 2013, were revised to comply with the Development of the Aviations Industry 2013-2025, Development of the Ship-Building Industry 2013-2030, Development of the Electronic Devices and Radio Electronics Industry 2013-2025 initiatives and the Russian Space Program 2013-2020.

In terms of percentage of revenue the companies were instructed to imitate R&D spendings of the largest foreign counterparts. The new levels of funding are to be achieved gradually, over 3-5 years. Following Implementation recommendations of the Ministry of Economic development, PID included goals in production and energy efficiency, environmental safety, self-cost and quality of goods.

Together the 60 public-owned companies are expected to invest in innovations 6 trillion roubles between 2011 and 2015 total, with 70% of that sum drawn from off-budget sources.

Observed R&D spendings grew by 56% in 2011 compared to 2010 — from 137 to 214 billion roubles. Off-budget financing is overtaking budget — 87% vs. 42%. The planned levels of efficiency for PID have been, on the whole, achieved. For example, revenue per employee has increased by 14.8% in nominal terms, by 8.7% in real terms.

A number of corporations in 2011-2012 have successfully made use of some elements of the “open innovation” model, actively involving third-party developers, research institutes, construction bureaus and colleges (unlike the “closed” model, where a company relies entirely on its homegrown research). The companies implementing PID are also planning to participate in developing technological platforms and R&D territorial clusters.

A more open corporate structure has increased the large-size companies' demand for research from science and education institutes and motivated them to work closer with small innovations firms. Large-size business has begun to contribute to an innovations-based environment. This can be seen from the public companies' burgeoning investments in R&D they outsource to colleges and scientific institutes. 5.2 billion roubles under 700 contracts have been spent in 2011 — 60% over the 2010 figure.

According to the Federal State Statistics Service (Rosstat),

6,3%

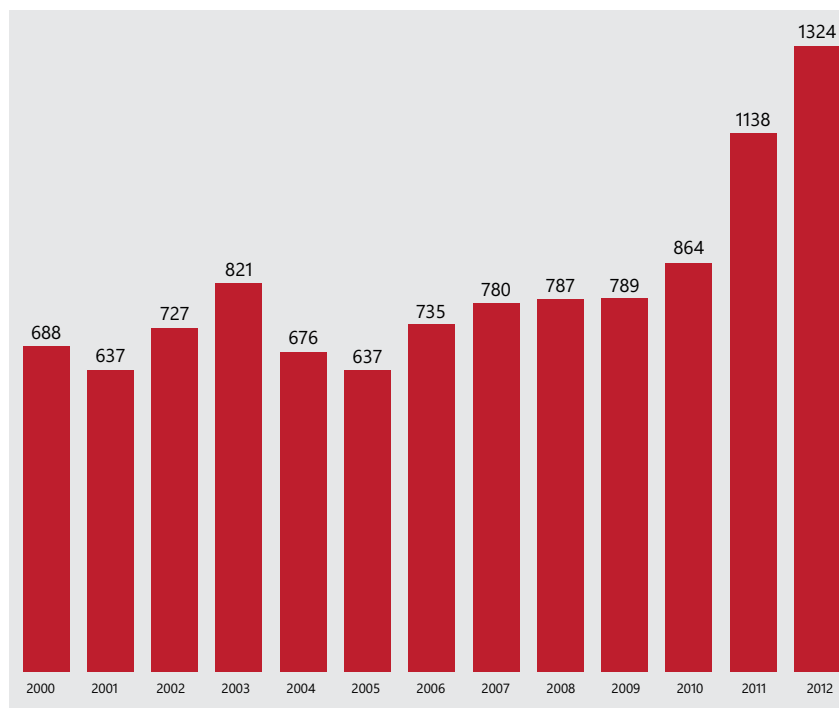
of the total volume of goods produced and services delivered by Russian companies in 2011 were innovative. The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 aims at 25-30% by 2020.

Fiscal motivation of innovation.

The government modernization program involves twofold use of fiscal stimuli — to encourage costly and long-term research programs at large companies and to support small and medium-size innovations firms.

The Strategy mentions the following uses of fiscal means:

The number of created (developed) industrial technologies in the Russian Federation

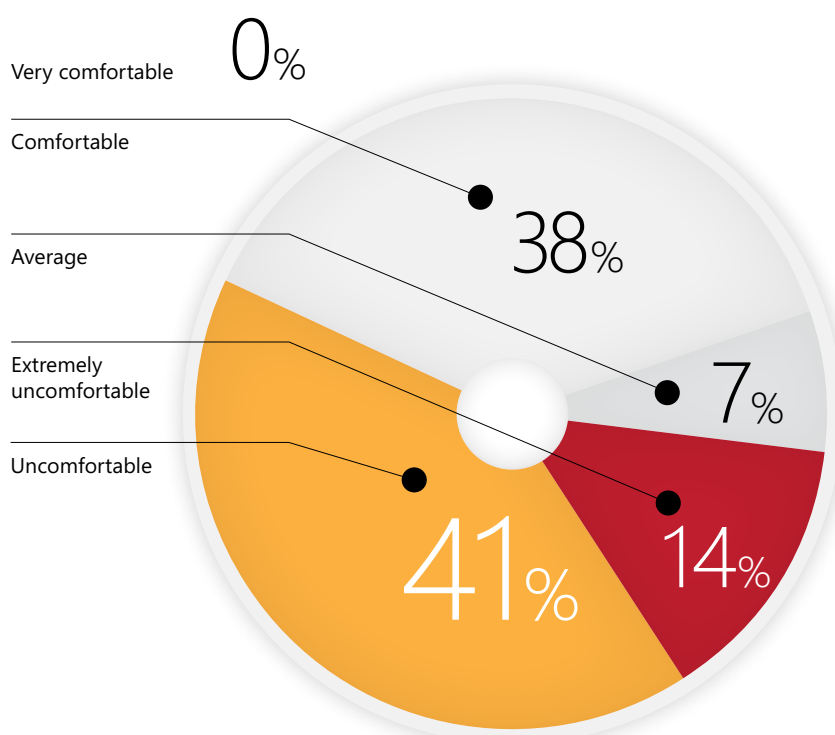


Source: Rosstat (Federal State Statistics Service)

- tax remissions for small and medium R&D companies and residents of special innovation zones and technology parks;
- favorable terms for venture investments and small innovators (engineering firms);
- capital gain remissions for all investors into all innovations companies;

- benefits for innovations companies at science hubs and restricted access municipalities;
- tax and statutory insurance deductions relief for engineering and IT businesses.

Evaluation of the legislative environment for innovations in Russian Federation



41% of respondents find the legislative environment still uncomfortable. Together with those who responded “extremely uncomfortable”, a total 55% of the respondents feel a vital need for further institutional reforms and improved legislative conditions for R&D.

However, 38% of the respondents said the environment quality was average, 7% said it was comfortable. Accordingly, 45% of those surveyed find the legislative conditions not “bad” but rather insufficient, requiring more efforts from the government.

Considering that the country only started towards innovations a few years ago, the overall opinion can be called cautiously positive. The basic elements of governance are in place but legislation and its practice urgently need to be brought in a closer correspondence.

Source: Survey of innovation market players, RVC, 11-24 April 2013.

One and a half years since the Strategy’s enaction are too short a time for profound and measurable changes in the fiscal system. But important steps have been taken.

The Skolkovo innovation center has received special attention from the Government and the President in this regard. It is a “testing grounds” for tax-related incentives that may spread to other innovation hubs. The innovation center’s infrastructure is still under construction, so fiscal legislation currently in place allows qualifying innovation companies based outside Skolkovo to be listed as residents with full tax benefits. The remissions and benefits had originally been specified in the federal Skolkovo Innovation Center law, enacted on 28 September 2010.

The Ministry of Economic Development wished these incentives to apply in other territories with large scientific and innovative potential, e.g. science hubs and restricted access municipalities. In November 2012 a bill was drafted, titled Changes to Article 10 of Federal law dated 28 September 2010 No. 244 on Skolkovo Innovation Center. The bill would make applicable in other innovations territories the Skolkovo benefits for companies whose executive body or representatives with full authority reside outside of Skolkovo. Municipalities to enjoy these benefits would include those with pilot innovations clusters. The Chairman of the Government (assignment ДМ-П8-5060 of 28 August 2012) approved an inventory of 25 eligible territories. They had had to meet two requirements: to host high technology, quickly growing manufacturing companies and to have a large pool of R&D and educational organizations within the cluster.

Companies in innovation territories that sign cooperation agreements with the management company would become associated members of the Skolkovo project. Their compulsory deductions to off-budget funds (the Pension Fund of the Russian Federation, the Social Insurance Fund, the Statutory Health Insurance Fund and local others) would be

smaller than the normal values from Federal law dated 24 July 2009 No. 212 on Pension, Social Insurance and Health Insurance Fund Deductions. The associated members would receive no other benefits.

This legislative change would extend support to businesses outside Skolkovo, increasing the project's bearing on the country's socio-economic development and closer integrating it into the national innovations system. Russia's innovation centers would be brought to more intimate cooperation, boosting their R&D potential and competitive strength.

The draft was returned for thorough governmental revision on 2 February 2012, to extend fiscal benefits beyond fund deductions. As of 25 March 2013, the revised document has been approved by the Ministries of Education, Industry and Trade, Health and Regional Development.

On the whole we must admit that the fiscal measures to stimulate innovation introduced before the Strategy remain largely ineffective. Companies receiving some innovation-related benefits are often invisible to the general tax legislation, making the exemptions impossible or very difficult to apply. Legislation also often describes the benefits in dense

and equivocal terms, requiring highly qualified specialists — a legal expert and an accountant — to make use of.

Creation of a system of grant, debt and venture-based sponsorship for innovation.

The last 5-6 years saw, with active involvement of the development institutions, an emergence and establishment of a system of R&D financing. Projects may be funded from the seed stage to trading in the stock market.

An R&D project on its way from idea to product develops in stages the venture investment theory calls seed, start-up, growth, expansion. Each phase is supposed to be funded by a different category of specialist investors, together raising an "innovations lift" to the stage of a mature high-technology business.

Practically every detail of a developed nation's "lift" is in place in Russia. Importantly, there are not only public, but mixed-ownership and private investors.

The government and its development institutions confine themselves to dissolving "hard spots" in coordination, adding capital to the system as a whole and concentrating resources on prioritized technical venues. On 6 April 2010 the development institutions and other organizations have signed a Continuous Co-Financing of Innovations Agreement, formalizing support of R&D businesses on

EXPERT OPINION

“There is definitely more venture money in the industry. Although some stages are funded better than others.

It's important now not to confuse "investment PR" with real availability of funding and its efficiency.

Some funds claim to be interested in innovations, but actually don't have the resources or competences for high-risk investments. I think at this point it is now more important to discuss not whether investments are hypothetically "available", but actual pipeline performance, comparing real successful deals in detail.

Sometimes I hear venture businessmen complaining that although there's money, it is not "smart". I say to them, where would "smart" money come from in such a short time?

It could only come from investors with their own portfolio of a few successful projects. In this sense failed projects are very valuable study subjects. We just have to wait for Russian investors to get some experience under their belt. Then more money will come to the industry, "smart" money.



VALERY KRIVENKO,
MANAGING PARTNER OF BRIGHT CAPITAL

EXPERT OPINION

“To my mind, for the next few years in Russia it will be IT projects that will show good growth rates. The support infrastructure for innovations still is not very far along, but IT companies need the least of it. As far as other industries are concerned, the government needs to clean house in fundamental science and keep improving the education system. For business — take down administrative barriers and create state demand for R&D.

"Exercises" with various programs, subsidies, grants are useful. But not too important. Unless administrative barriers go down and the government itself become an active consumer of innovations, setting an example for others on the domestic market, it's hard to expect private business to be interested in innovative projects. State procurement could be an effective tool for assisting R&D.

Another important measure is to make all government funding instruments — for grants and especially investments — private-public partnerships. Money from the budget alone is far from very effective. For the same reason the physical parts of the "infrastructure" — technoparks, incubators — should be in private hands. Let the government only subsidize them for a limited time.



KONSTANTIN FOKIN,
HEAD OF THE MOSCOW CENTER FOR INNOVATION DEVELOPMENT

every step of the way. To make the “innovations lift” operational, a system of information sharing about promising innovations, their transfer from one institute to another has been developed. The R&D sector and practical commerce are coming together.

The collaborating parties were: Foundation for Assistance to Small Innovative Enterprises in Science and Technology (FASIE), RVC and its venture and seed funds, RUSNANO and its venture funds, the Fund for Infrastructure and Educational Programs, Vnesheconombank, SME Bank, a federal executive body — Federal Agency for Youth Affairs, civic institutes — OPORTA ROSSII, Russian Venture Capital Association and a specialized trading facility of the

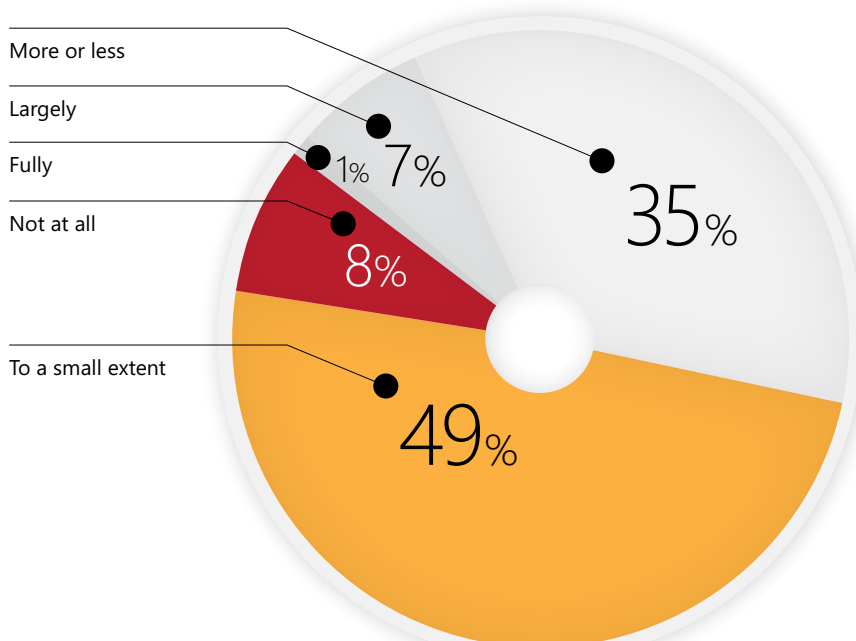
OJSC “Moscow Exchange MICEX-RTS” — Market for Innovations and Investments (MII). Each development institute provides “lifting” for a particular development stage, depending on scope and specialty.

In 2011 Skolkovo Foundation joined the Agreement to provide grants for its residents, in 2012 the Russian Technological Development Fund also joined, offering soft credit for R&D and managerial resources at the expansion and growth stages. Government decrees Nos. 680 of 3 July 2012 and 246 of 20 March 2013 have been enacted. They allow FASIE to provide a wider range of grants.

The Development of Science and Technology state program, enacted by Government decree 2433-p on 20 December 2012, will increase funding for the Russian Technological Development Fund to 6 billion roubles by 2020. And the program Economic Development and Innovations-based Economy, enacted by the Chairman of Government on 3 April 2013, will increase FASIE’s funding from 4 to 20 billion by 2020.

Quality of available capital

To what extent can the capital available to Russian innovations companies be considered “smart money”?



A total of 43% of respondents consider the capital available to the innovations companies “smart money”. Although 35% gave very cautious assessments, this is, on the whole, an encouraging sign, considering the age of the Russian innovations market (and the venture market).

It is obvious, however, that the development institutions and investors during the second stage of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 will have significant improvement of investment quality among their most important objectives. Further developing competences that go along with sponsoring start-ups will be an essential element.

Source: Survey of innovation market players, RVC, 11-24 April 2013.

EXPERT OPINION

“Looking at positive tendencies on the innovations market in the country, I can single out “diagonal” relationships between competences centers, investors and projects. These connections were not there just two-three years ago. Entrepreneurs and investors still speak different languages, and that is a major problem, but they are beginning to understand each other. Also the venture industry is starting to see people from the real economy, and companies that have “pushed off” with It and the Internet are themselves showing interest in investing. But there are issues, too. The worst is incompetent start-ups. Most of them have great teams and excellent core ideas but they imagine their product audience to be like themselves. They don’t understand how the market they want to conquer works. Young guys from start-ups need mentors to explain them the rules. At the same time, there are plenty of large corporations in the country, with way-wise managers. They know how the market works. For now, middle-level managers rarely want to try coaching start-ups, help them — not even with money, but with advice. But the trend is there. Innovations are becoming more popular, start-ups are not a shocking novelty anymore. Now is the time to start involving white collars.



RENAT GARIPOV,
CO-FOUNDER OF GREENFIELD PROJECT

Expanded early-stage financial and other support for innovators, including under the program of support of small and medium-sized enterprises.

In the last 4-5 years the mechanisms and programs to support small and medium-sized companies have been changed and fine-tuned. They now also address small companies in R&D.

The federal budget, following Government decree No. 178 of 27 February 2009, allocates yearly subsidies to competitively selected subjects in the Federation, to be used for the program of support of small and medium-sized enterprises. The subsidies are given under co-financing. A separate order by the Ministry of Economic Development establishes a country-wide list of priorities. But a Federation subject can choose the manner and priorities of support within the program on its territory with its national, cultural and socio-economic particulars.

In 2012 490 small innovations companies from 24 regions have received grants.

In 2010 a special infrastructure of support was introduced. In 2010-2012 30 centers of support for small and medium-sized innovators were created, including:

- 2 clusters;
- 6 prototyping centers;
- 5 shared use centers;
- 1 design center;
- 2 technology transfer centers;
- 2 commercialization centers;
- 1 subcontracting center and others.

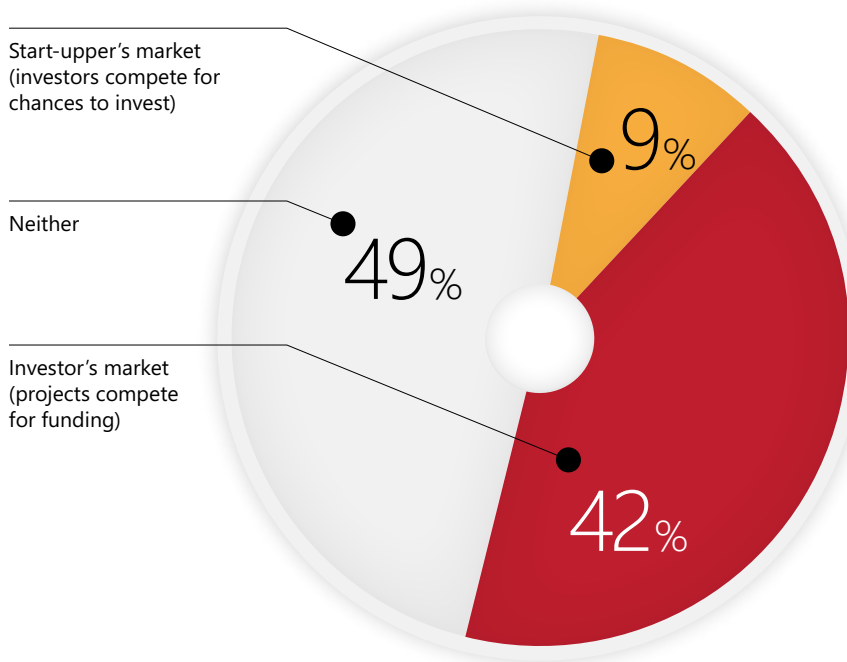
A system of business incubators for R&D is developing. In 2012 16 incubators supported innovations companies.

State development institutions are particularly important for early-stage support, because the more start-ups take the “innovations lift”, the more effective the work of investors and other organizations on the “upper floors” can be. But investing at the earliest stages of a venture is considered especially risky, and private investors often prefer to wait. Seed investment, as a result, is the most hollow

niche in the Russian venture industry — confirmed by a joint review by the Russian Public Opinion Research Center (WCIOM) and RVC, “Early-stage venture investment market: the main trends” (Moscow, 2013). According to the Russian Venture Capital Association, the “visible” market of seed investments in 2011 was \$130 million with 85 deals. This is about 4.2% of Russia’s total venture volume.

Stepping in for the seed are RVC’s Seed Investments Fund (18 projects approved for financing in 2012, Fund contributions 500 million roubles) and FASIE (supports 2500 small innovations companies and 2000 individual scientists, helps create 500-550 companies a year).

Evaluation of market clout of investors and investees



42% of the respondents think the innovations segment of the Russian economy an investor’s market, only 9% a start-upper’s market.

This result throws doubt on the commonly heard assertion that investors in the Russian venture market are competing ever harder and even have to invest in weak projects. The picture the survey gives shows rather a healthy market situation — investors have a choice and projects compete for their attention, which helps improve projects’ quality, technological, marketing and generally commercial merits.

Source: Survey of innovation market players, RVC, 11-24 April 2013.

A SUCCESS STORY

Zelenograd Immunobiological Company

INNOVATIVE PRODUCT

Complex immunoglobulin medication (CIM)



INVESTORS

Foundation for Assistance to Small Innovative Enterprises in Science and Technology (FASIE) — 850000 roubles for development under the Start program, 3.4 million under the Stavka program; independent investors

INVESTMENT OUTCOME

Medication in serial production

In 2005 a group of scientists opened a ZAO Zelenograd Immunobiological Company (ZIC) and applied for participation in FASIE's Start program. FASIE provided 850,000 roubles for the first stage of a program to develop a complex immunoglobulin medication (CIM) and set up production of it.

The drug's development history goes back to the USSR. At that time, research for it had been being done at the Institute for Blood Research. The Moscow Gabrichevsky Research Institute of Epidemiology and Microbiology had been chosen for production, but with the collapse of the USSR development has ground to a halt. The start-up founders have decided to change CIM's production technology to improve quality and build a manufacturing shop compliant with GMP requirements. GMP or Good Manufacturing Practice is a strict set of international standards. No more than 50 of Russia's 600 laboratories satisfy them.

CIM is a special-use medicine from human plasma. First, Cohn fractionation is used to extract a protein, albumin, then, at a blood bank, immunoglobulin G is produced. In 2005 the researchers at ZIC received a patent and started to buy clinical waste to use in creating their complex (containing three types of immunoglobulin — A, B and G) medication.

In 2007 ZIC changed to the more advanced Stavka funding program, receiving 3.4 million roubles and striking an agreement with a leasing company. The project as a whole demanded large investments — 120 million roubles.

With the technology perfected, ZIC decided to research an intravenous option.

The original medication is spray-dried powder. It is meant for children, used when infants aged one month and older suffer from an acute intestinal infection.

The powdery medicine dissolves in water, so there is no need for injections. More importantly, it replaces antibiotics, and changes for the better can be seen within two days.

ZIC's research in its third stage focused on an intravenous version. The Stavka program subsidized ZIC with 3.6 million roubles. The company managed to muster 180 million overall and in 2011 began serial production. CIM is now sold in all Russian pharmacies and figures on the government's Vital Medications list. After it was put on the list with the Ministry of Health's approval, its price dropped and is now 599 roubles, VAT and retail mark-up exclusive.

In 2012 40 million 770 thousand roubles' worth of CIM were produced.

JOINT EFFORTS OF BUSINESS, SCIENCE AND GOVERNMENT TOWARDS PRIORITY DEVELOPMENT GOALS

Creating and developing priority technological platforms. Mechanisms for their evaluation and evaluation of state efforts to support them.

The Strategy speaks of "technological platforms" as one of the most important carriers of common efforts by corporations, science, the educational system and government to achieve the priorities in innovation. They are to become discussion floors for all parties interested in development of scientific and technological potential, a place to productively mingle, plan and set the agenda.

In 2011-2012 the Governmental Commission on High Technologies and Innovations has charted a list of 32 technological platforms.

Really making each work requires a different range of measures. The government institutes have played and continue to play an important part here. They attract representatives of various platforms to reviewing and implementing projects, draw on their competences for long-term predictions of technological development, invite for reeducation and advanced training of scientists and engineers. State-owned companies are required to participate in their profile technological platforms.

Platforms with appropriate profiles collaborate with Skolkovo's clusters. In 2012 some platform representatives have joined permanent Skoltech consulting groups in the prioritized venues. A Skoltech consulting group is a special advisory board directing research and education to the technological and staffing needs of major companies in the industries crucial to the Russian economy.

Also, implementing decisions of the Governmental Commission on High Technology and Innovation, a number of federal ministries and Federation subjects have begun pilot projects to introduce a requirement for innovation to public procurement.

Representatives of technological platforms serve in profile boards of experts and help formulate suggestions for better efficiency and innovation

requirements for procurements, e.g. recommend technical standards and buying lists.

In 2012 a number of the platforms cleared their legal status and began to form non-profit partnerships to manage and coordinate work on the platforms.

One of the platforms' priorities is to increase presence of Russian technologies in the home and international markets. The following development objectives are especially important.

1. Improve demand for high-technology products in the home market, e.g. by platform participation in development of technical procedures and technological standards; create and carry out collective projects to increase high-technology and innovations exports.

2. Use the technological platforms' potential for more active Russian involvement in international scientific initiatives and linkage with global value-added chains. Greater cooperation with the European Union's technological platforms and other international bodies should be the first step.
3. Attract small and medium-size high-technology companies to technological teamwork with large business, e.g. at innovations clusters.

In addition, the Ministry of Economic Development and some executive offices are working on a program of assistance for Russian technological

EXPERT OPINION

“No doubt about it: the Russian Internet market is all grown-up. This shows in the number of online campaigns, in ever more active domestic and Western investors. In the global business community the Russian online segment is rightly considered one of the most promising, both for businessmen who want a to build a successful company and for investors eager to get the most out of an industry with good growth and recoup investments soon.



Fastlane Ventures today has become a kind of entrepreneurs' club. Our strategy is based on the idea that founders and key team members must themselves be experienced businessmen with impressive success stories. They help young people fulfill their dreams with experience knowledge. We are not a regular kind of investment fund, because we help our partner teams in new companies with both funding and advice. Our goal is to help new leaders turn a good idea into a successful online company that would compete in the first lines in various online segments. We expect the Internet market to keep expanding in every direction now. We think there will be at least 1500 new online projects appearing every year in Russia, 10-15 of which will become new stars on the local market — and maybe on the global market, too. Of course, competition in practically every niche is already quite tense, so it's important to seize the day and start putting ideas to practice now. We believe our business model gives start-uppers serious advantages: it allows them to make use of all our collected experience when building a business model, saving them a lot of time and resources for moving on a proven development course or using tried and tested tools. Bringing a business idea to practice is still a key determinant of its success and the company's chances for leadership.

MARINA TRESCHOVA,
CEO OF FASTLANE VENTURES

EXPERT OPINION

“Abundance of a large number of service companies for R&D requires a full-grown market of companies needing “packaging” and funds that understand its importance — and that we do not have. Another reason there are few “packaging” companies in Russian innovations is because they don't have a clear revenue model. Have a look at the Russian venture industry: around half or even more is IT and Internet projects, 25% more — biotech. Other industries — material engineering, nanotechnology and so on — have few projects and few venture funds, and the revenue model of players transferring ideas to commercial products there is shaky and not always clear.



A classic company in consulting and “packaging” gets part of the business for helping create the product and a business model. Exiting the project, it can hope to attract an investor and convert its share to money. But at the moment most venture funds don't let consultants sell.

A “packager” is practically obligated to stay in the R&D project for 4-6 years. And that is a business model that requires money as long-term and risky as the R&D project itself.

When you enter a few projects as a consultant, you can probably count on no exits in the first year or two and most likely won't get more than one or two exits in year three. That means someone else has to finance your company's existence for at least three years. It was a good news for the market when RVC agreed to take on this support with accelerators and incubators. To me the number of available “packagers” for R&D and their quality are indicators of how mature a market is. There was a time we did not have venture funds or an organized network of business angels. Now the government has helped put together a so-called “lift” with Foundation for Assistance to Small Innovative Enterprises (FASIE) for early stages all the way up to RUSNANO for late ones. At some point, when the number of projects reaches a critical mass, an articulate and stable demand for consulting and a working business model for “packaging” will appear.

There is another problem. A service company must have a constant source of start-ups. For our technology transfer center the source is the Russian Academy of Sciences. That allows us to see what kind of start-ups we may encounter and create a constant pipeline. But our country on the whole has few people ready to take a risk and start their own business.

So the government needs to support and advertise business as a way of self-fulfillment for young people. Unfortunately, our society still does not have an image of an entrepreneur as a “hero”, a ground-breaker. More like the contrary: we still think of businessmen as people who “speculate” in something. In an innovations ecosystem everything is related. And service companies won't be able to work without an ideology of entrepreneurship.

Another measure “packagers” need is to actively integrate Russian science into the world community. Any technology becomes effective when there is demand for it. The government should decide on priorities and create roadmaps for global R&D development in key industries. This would guarantee demand and motivate scientists to turn their research into commercial projects.

Many people today are afraid of risks, inevitable for start-ups. A government-supported roadmap would help hedge those risks.

ALEXEY GOSTMELSKY,
CEO OF THE RAS AND RUSNANO CENTER FOR TECHNOLOGY TRANSFER

EXPERT OPINION

“The infrastructure for the innovations business in Russia is already rather extensive. There are venture funds, working with projects of various degrees of readiness, from seeds to full-grown ones, there are development institutions — RVC, RUSNANO, Skolkovo, Agency for Strategic Initiatives (SIA) etc. I've worked directly with RUSNANO, Skolkovo and a few venture funds and can say they are quite professional in what they do. The government in the last few years also managed to create a good number of preferences that stimulate small and medium-size innovations business, so there are no deadlocks on the whole.



But the innovations business still has a ways to go. Not only because of the many years of losing the Soviet edge in science and technology, but also because Soviet science was from the beginning oriented at grand objectives. There was no such thing as “innovators” — people who could be both scientists/engineers and businessmen. So all development institutions and venture funds are running into the same problem: the money is there, but no one to give it to. They've combed the whole country, and now every team with a sensible idea and an ability to “package” it has got institutes throwing themselves at it.

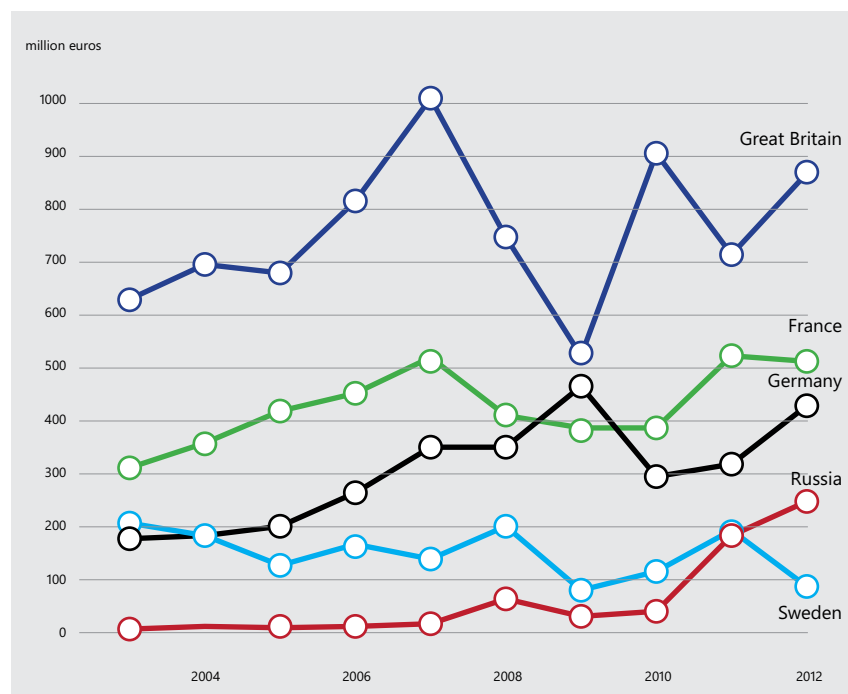
It's obvious that we must change strategies — from “treasure-hunting” (looking for rare diamonds in barren rock) to “farming” (plow the ground so our new Lomonosovs can grow up). That is what is happening now. RUSNANO's nanocenters, the Skolkovo project and other institutes in the infrastructure are working to till the land.

I would recommend making this effort more targeted. Plant big “trees” that can give “fruit” — innovations companies.

Nanocenters, Skolkovo, large centers with the universities and the Russian Academy of Sciences must all become such “fruit trees”. Involving large foreign companies — Intel, Sun/Oracle, Motorola, main car makers' GE and R&D departments — would be very helpful. We need to do everything we can to convince them that placing their competence centers in Russia is advantageous, whether it is in Skolkovo, in nanocenters or next to manufacturing plants. The “fruit” that falls all industries and the whole country will be able to enjoy.

SERGEY DUDNIKOV,
CEO OF RST-INVENT

Top 5 European countries by venture investments in high-tech



Note: without semi-conductors.

Source: Dow Jones VentureSource 2012.

programs in their interaction with EU platforms and other foreign scientific partners.

Business associations help create state innovations policy.

In the time since the Strategy's enactment several effective mechanisms have been developed, allowing companies and business associations to take an active hand in charting the future of innovation. For example, there are now with the Presidential Council for Economic Modernization and Innovative Development an Inter-Departmental Commission on Implementation of the Russian Innovations Policy 2020 and an Inter-Departmental Commission on Technological Development. The Ministry of Economic Development tries to interest business associations to platform creation and selection of territorial clusters

EXPERT OPINION

“In robotics today I don't see one “central” Silicon value type center, like in the online industry. We are keeping an eye on everything that happens in the industry in Europe, the US, Asia and Russia. And they all have their interesting projects, their strong points.



That is good, because it means our country stands a decent chance of finding a place in the multi-billion and fast-growing global robotics industry. As far as the Russian robotics market is concerned, most start-ups appear in robotics software. That's no surprise, Russia has a strong programming tradition. Without quality software successful projects in the sector are impossible, so we have here a potential advantage we should explore.

Grishin Robotics as an investor is mostly interested in robotics products for the end consumer. It's in that sector that we see the most breakthrough potential and possibilities for global growth. But, regrettably, there are few Russian start ups in that field yet. The robotics companies we have mostly make components for military and space products, on state contracts.

How to increase the number of quality start-ups in consumer robotics? I believe we should think in broader terms — how to help develop an entrepreneurial culture in the country. There are many ways: making incorporation easier, tax incentives and so on. Better availability of qualified investors in the sector is also important. I'm happy to see that with Grishin Robotics on the market many Russian venture funds are taking more interest in robotics start-ups and have a better opinion of them.

DMITRY GRISHIN,
CO-FOUNDER AND CEO OF MAIL.RU AND FOUNDER
OF GRISHIN ROBOTICS

as well as participation in important innovation forums and preparing reports for the Council's sessions.

High-technology business associations present suggestions for implementing the state policy on innovations to the R&D Directors' Club, a community of senior managers of leading Russian companies in innovations development, science and research. The Club was founded by National Research University — Higher School of Economics and VEB Innovation Fund on 23 July 2012. On 29 March 2013, the Club met to elect a supervisory board including representatives of federal executive authorities, business, education and development institutions. There are currently 24 members in the Club — Russian market leaders, the Higher School and VEB Innovation. Around 10 more companies are preparing membership applications.

RUSSIAN MARKET OF INFORMATION AND COMMUNICATION TECHNOLOGIES AS AN EXAMPLE OF A DEVELOPING INNOVATION INDUSTRY

Russian ICT in 2012.

Under the Strategy, the most promising sectors to host new high-technology markets are nano-, bio- and information and communication technologies or ICT. This industry is made up mostly of a (quickly growing) number of small and medium-size companies.

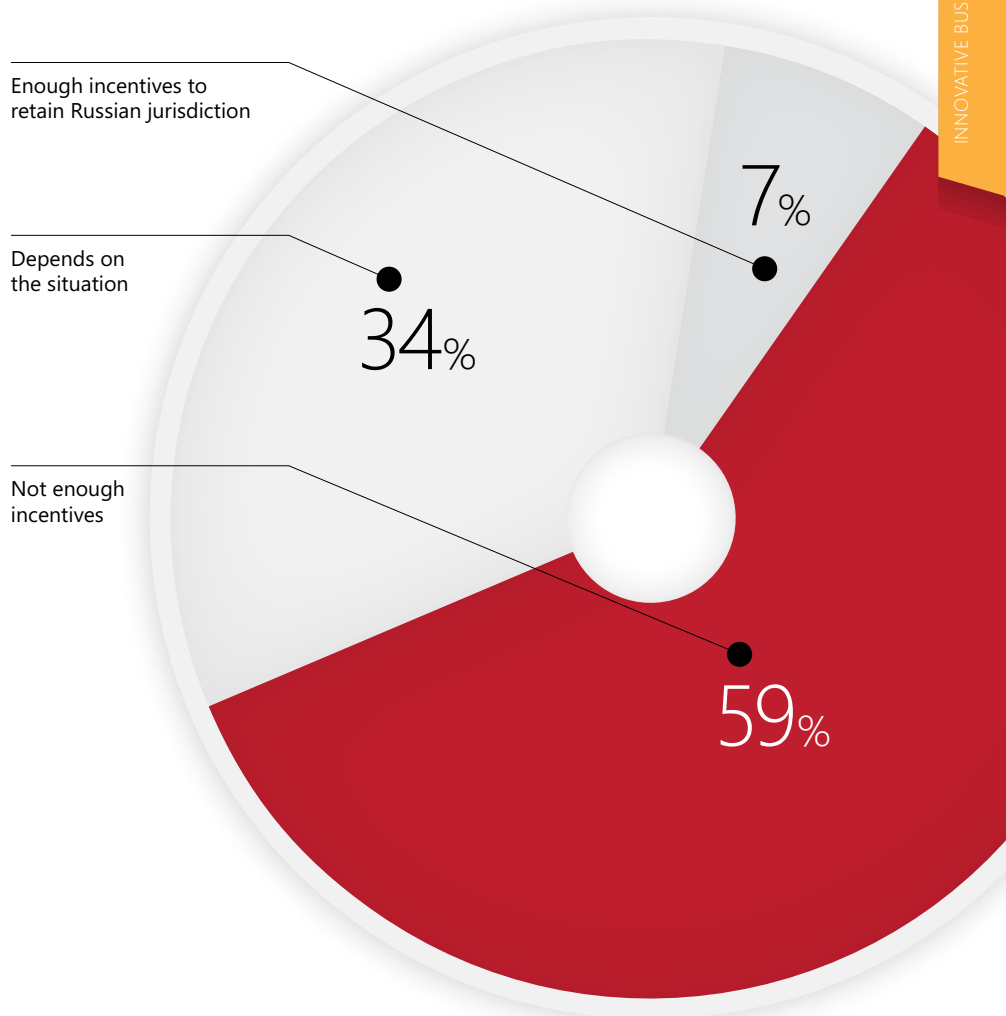
Competitive strength of the national economy is directly related to development in ICT. Innovative ICT can change and advance all industries in the Russian economy — science and education, medical, administrative etc.

On 24 December 2012, during a meeting of the Presidential Council for Economic Modernization and Innovative Development, presided over by the Chairman of the Government D.A. Medvedev, the Minister of Communications and Mass Media N.A. Nikiforov reported the following about the industry's progress. In 2012 IT's share in the country's GDP had reached 1.2%, total revenues from exports were \$3.5 billion. IT grew by 18% that year.

The volume of translations for venture financing in IT was over 10 billion roubles. 0.6% of total

Appeal of continued Russian jurisdiction for R&D companies successful abroad

How would you evaluate the government's efforts to retain companies whose international revenues begin to surpass domestic?

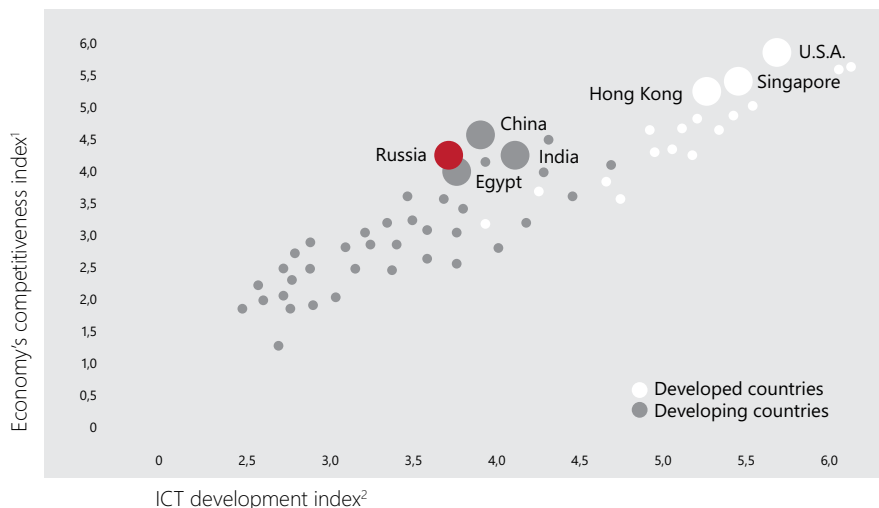


The survey participants were asked for their opinion on the incentives given to companies with the bulk of their business in foreign markets to remain in Russia.

Unfortunately, 59% of respondents think the stimuli in place lacking. This points to importance of a comprehensive development of the innovations sector. Policy here should take into account the risk of losing, in one form or another, the most successful exporters.

Source: Survey of innovation market players, RVC, 11-24 April 2013.

Relationship between competitive strength of the national economy and development of the IT industry



1. Includes indicators of institutional and infrastructural development, macroeconomic position, health and education, market efficiency, business organization and innovation.
2. Includes indicators of availability of telecommunications channels, telecom prices, penetration and presence of broadband Internet.

Source: "IT industry development in the Russian Federation. The view of the business community". AP KIT with McKinsey & Company, Moscow, November 2012.

EXPERT OPINION

“In my opinion, today attention should focus on developing “packaging” companies that take R&D seed projects under their wing and lead them through the process from idea to first venture investments. There are not too many such firms in the country today. Consultants in Russia are still hired mostly for one-time services. Projects rarely ask to be “packaged” all the way.

Russian start-ups are still unused to a comprehensive approach, with finding a “packager” or a mentor and vesting complete trust in it for “packaging” in exchange for a portion of the business.

Development institutions are promoting “packaging” and acceleration as well as they can. For example, RVC supports projects of that type, e.g. with its Business Information Technology competition (BIT). That is a positive development.

But before turning to a “packager” a project needs to have if not a prototype, then at least some specific contour, blueprint or alpha-version. As it is, consultants don’t have much of an entry flow of projects with something to “package”.

Another problem they have is not enough associations of technical experts. Serious work with an investment can’t begin in most cases without a clear assessment from the experts. “Packagers” themselves are usually economists, managers, market analysts. They often find it hard to understand a product’s details, they are not “tech-savvy” and don’t keep track of research. Associations of experts could help, providing expertise on request. At the moment “packagers” have to spend a long time looking for competent reviewers.



LEONID DANILOV,
CO-FOUNDER OF THE CENTER FOR INNOVATION COMMERCIALIZATION AND
COORDINATOR OF TIME2MARKET PROJECT

employment in Russia was in the IT sector. The Russian Internet market became the largest in Europe, with penetration of computers 50% (for comparison, it is 96% in the US). The ICT sector had been growing largely on introduction of information technologies to other industries.

The ICT market in Russia is distinguished by young personnel (under 30 on average) and fairly low labour costs. But ICT business still has far to go. There is plenty of creative potential for new products, including some for the mass market — domestic and foreign. Also with average annual output 2 million roubles even the most successful IT companies are still 5 to 20 times smaller than the global leaders.

The telecommunications market in 2012 had a volume of 1.3 billion roubles and contributed 2% to the GDP. The country had surpassed all others in Europe in number of Internet users, telecom investments had reached 200 billion roubles, ploughback of the industry’s three largest companies was in excess of 2 trillion roubles. Russia had risen to the 4th position globally by number of 4G LTE users.

The mobile telecom market showed good growth. Today practically every Russian citizen has access to wireless connectivity. In penetration of mobile telecommunications Russia is ahead of European countries. Smartphone penetration is growing as is the share of electronic/mobile commerce. NFC devices are gaining ground. However, broadband access is still less common than in developed countries and spreading slower than mobile telecom. Untapped contribution to GDP from broadband is estimated at 1.4%. Broadband pricing remains fairly steep. Electronic payments systems are penetrating the market two-three times slower than in developed countries.

Development venues for the industry.

The Presidential Council for Economic Modernization and Innovative Development on 24 December 2012, set the following objectives for the Ministry of Communications and Mass Media in the ICT sector:

- In IT: create breakthrough research centers, integrate Russian IT into global market, provide long-term financing for key researchers, focus

attention of funds and development institutions on seed and pre-seed funding, hedge early investment risks, give fiscal incentives to companies, e.g. smaller statutory deductions to social insurance for small and medium-size companies.

- In broadband development: step in for infrastructure where creating it is unprofitable for commercial carriers, e.g. the Norilsk supergrid, introduce technologies to cut steeply carriers' capital and operational expenses and prepare them for an exponential growth of traffic. A National Plan for Broadband should also be implemented to do away with "digital inequality", e.g. by using innovative technologies and telecom solutions.

EXPERT OPINION

“Looking back at the last few years we can say that the government has finally noticed the innovations business, e.g. software development. There is more dialogue between the industry and the authorities, business associations ARPPSOFT and Russoft are actively working.



There are considerable social insurance benefits. R&D eligible for income tax relief includes the most important IT sectors. Then there is Skolkovo with its tax remissions. All this has taken some of the fiscal burden off software developers and helps R&D businesses.

On the other hand, there are still macroeconomic growth ceilings, e.g. very high (and climbing) salaries for developers, especially in Moscow, here most of them live. That is closely related to a general growth of salaries in large cities and a shortage of graduates from technical schools qualified for work in modern IT. There are some excellent administrative changes in that area, but it will take time for them to have an effect. Another ceiling is high rental costs in Moscow — several times the costs in California, to give some idea. And relocating to another town often is not an option, there are not enough specialists there. Debt financing for software developers is still basically non-existent. The Central Bank's current policy means the banks can't sponsor software with its recoupment cycle two-three years and no material assets to put up for security.

As a company grows and moves to outside markets, it meets a harsh competitive environment, but the government has almost no instruments to support exports. Any Russian company venturing to the US market is on its own against their aggressive patenting system. Large American corporations use it as a non-financial barrier to outsiders. Consistent help with these non-market barriers would be very valuable to all domestic developers with global ambitions.

VADIM TERESCHENKO,
SENIOR VICE PRESIDENT AND CFO OF ABBYY GROUP

Russian venture investments market in 2012

By industry

IT
\$792.1 million / 168 transactions

Biotechnologies
\$10.2 million / 15 transactions

Industrial technologies
\$108.4 million / 18 transactions

Grants
\$145 million / 702 transactions

Investments in infrastructure
\$37.7 million / 8 transactions

Large transactions
\$516 million / 3 transactions

Venture exits
\$372 million / 12 transactions

By stage

Expansion
\$517.7 million / 14 transactions

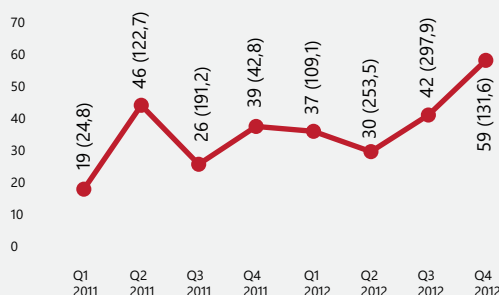
Early growth
\$255.4 million / 32 transactions

Start-up
\$100 million / 71 transactions

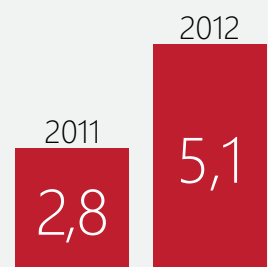
Seed
\$37,5 million / 84 transactions

Source: "MoneyTree. Venture Market Navigator. Overview of Venture Capital Deal, Russia, 2012". PwC and RVC.

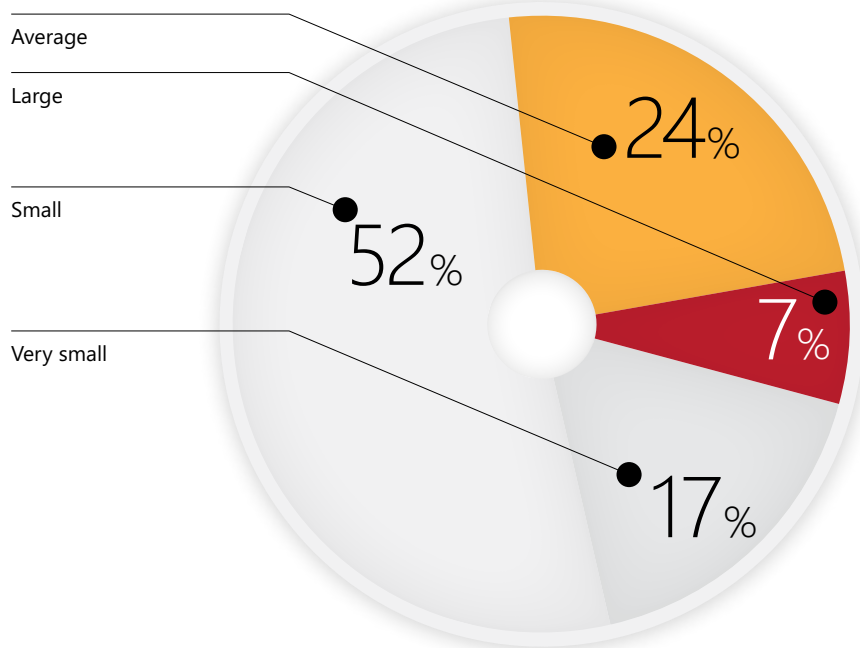
Dynamics of venture transactions in IT in 2011-2012, number of transactions, \$ million



Average size of venture transaction in IT in 2011-2012, \$ million



Share of quality projects in the Russian tech start-up market



The respondents' answers show that start-up projects' quality, on the whole, is still not too high. This correlates with other recent studies.

According to their data, no more one third of start-up companies are currently pursuing projects with more or less decent quality. This conclusion also corresponds well with results of other questions in this survey, pointing to competition between projects for investments.

On the whole this is a typical picture for a young R&D market.

Source: Survey of innovation market players, RVC, 11-24 April 2013.

- In infrastructural development for electronic payments — achieve cross-device compatibility, creating a national technological standard for e-payments, and ensure their ubiquitous availability. Government regulations and incentives will be used to help introduce NFC in most smartphone devices.

Speaking at the Council meeting, Chairman of the Government D. A. Medvedev said that 21 billion roubles of budgeted funds had been allocated for support of innovations in ICT under the ongoing state and federal special purpose programs. Nearly 2.5 billion roubles had been given

to colleges to attract leading specialists in IT and for joint programs in manufacturing. Domestic development institutions have also invested more than 73 billion roubles into the industry over the last few years.

At the Council meeting the Ministries of Communications and Mass Media, Economic Development and Finance were tasked with making cheaper home Internet.

Global IT market challenges.

Progress in the national ICT industry is plain to see. But the potential is far from exhausted. Effective use of Strategy mechanisms can give ICT a fresh boost.

Russian ICT market players, investors, technological entrepreneurs and development institutions supporting promising projects should concentrate on development in cloud computing, big data, the Internet of Things, digital industry, mobility and cybersecurity — keeping in mind that the world ICT market and the technologies themselves are now entering a new phase of their structural development.

Analysts from Gartner have studied the ICT market situation and identified four forces that will shape it in the near future. They are social (that is, social networks and related instruments), mobile (mobile access to information), cloud (computing) and broadly information, and they are beginning to create a unified synergistic field of technologies, solutions, services and market segments. The cumulative effect several innovative technologies are having on the global market Gartner's experts call a Nexus of Forces¹.

Gartner points to **consumerization** as a catalyst. This is a totality of effects of the wide spread of new digital devices (smartphones and tablets) that are powerfully changing all of the IT market, including the market of corporate decisions which formerly had no direct relationship with the consumer market.

¹ The Nexus of Forces: Social, Mobile, Cloud and Information // Gartner. URL: <http://www.gartner.com/technology/research/nexus-of-forces/> (accessed on 01.05.2013).

EXPERT OPINION

“The quality of Russian seed projects is improving, but that is more evolutionary, not revolutionary development. Ten years ago project leaders did not always know exactly why they are coming to business, what they need funding for.



Now they know it better, and that's a plus. Then again, we have a long way to go. Many things that should be obvious to start-uppers still are not, although basic requirements to projects and innovators have been described in books and said in investors' interviews over and over. This is something that can be explained and taught. And understanding of specifics of the R&D business, what makes a "perfect" venture start-up will come sooner or later. But it has not come yet.

In spite of general progress, Russian early-stage innovators still need to work on project quality.

Because the media are making such a fuss over innovations one should not think there is a boom of them. Just some progress, the evolutionary sort. From what we hear, there are many projects going around from one investor to the next. This creates an appearance of an active community of start-uppers. But if we count innovations companies, it's obvious we are still far from an exponential growth.

Much is being said about obstacles to growth. But statistics show that most innovations companies, in Russia and out, are in IT. And that industry is special in some ways, e.g. basically does not need trans-national shipments, so customs administration for IT is almost unimportant. What matters to IT innovations companies is, for example, salary size and taxes on it.

But there are numerous ways to solve these problems, too. It would, of course, be better if we did not have to spend time on them. But they are nothing momentous.

Now, as far as the environment is concerned, we need to understand that b2b and b2c start-ups exist in very different conditions. b2b start-ups work for large companies, optimizing their business processes and earning them money. Corporations' interest in efficiency has to do with competition, global and local. But in Russia not too many big business segments are competitive yet, and our corporations fight more for privileged access to the government than do a tug-of-war over customers the classic way, as it happens on developed markets. Big business does not have much demand for R&D. And that is a pressing issue. The situation with b2c is better. And improving faster. The market plays more of a role here. In truth, no country has ever created an environment for b2c with initiatives from the top.

The only way to do that is to develop a competitive market that can set off mass consumption. Its natural development is what will create demand for innovations.

VADIM ASADOV,
FOUNDER AND CEO OF RUSSIAN-AMERICAN GROUP
OF HIGH TECHNOLOGY COMPANIES NEUROK AND
BUSINESS ANGEL

Technological platforms

A full list of platforms approved by the Governmental Commission on High Technology and Innovation

Medical and biotechnologies

- Advanced medicine
- Biotechnologies and bioresources — BioTech2030
- Bioenergy

Information and communication technologies

- National software platform
- National supercomputer platform

Photonics

- Innovative laser, optical and optoelectronic technologies — photonics
- Development of Russian diode technologies

Aviation and space

- Aviation mobility and aviation technologies
- National space platform
- National system of informational satellites

Nuclear and radiation technologies

- Closed fuel cycle with fast reactors
- Controlled fusion
- Radiation technologies

Energy

- Russian intellectual energy system
- Clean efficient power
- Renewable energy
- Distributed power generation

Transport

- Innovations for efficient construction, maintenance and security of motorways and railways
- Fast intellectual railways

Metallurgy and new materials

- New polymer composites and technologies
- Metallurgical materials and technologies

Natural resources and oil and gas refining

- Solid minerals process platform
- Production and use of carbohydrates
- Advanced processing of carbohydrates

Electronics and mechanical engineering

- Mechatronics, embedded control systems, radio frequency identification and robotics
- Super-high frequencies
- Marine exploration

Ecological development

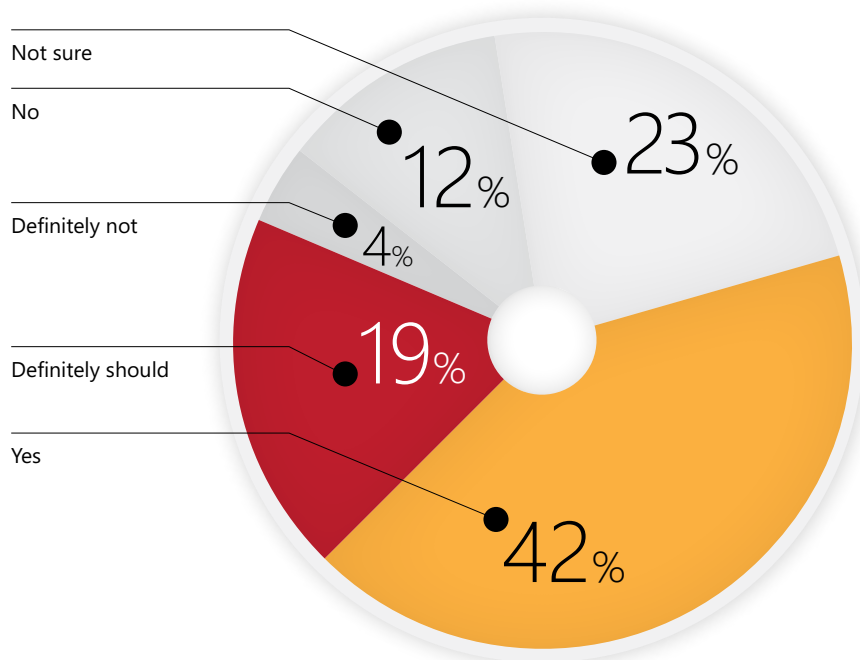
- Technologies of ecological development
- "Green car" — clean conveyance

Industrial technologies

- Modeling and operation of high-technology system
- Textile industry and consumer goods
- "Healthy foodstuffs" — food and food processing technologies

Attitudes towards the copycat model

Do you believe the Russian market should adopt business models and technologies from the global market?



The majority of respondents (61% from 42% with “Yes” and 19% with “Definitely should”) think replication of foreign business models and technologies in Russia to be proper and permissible.

These conclusions allow us to conclude that more than half of Russian players in the innovations field are seriously oriented at the domestic market, replicating for it technologies, goods and services from elsewhere.

Source: Survey of innovation market players, RVC, 11-24 April 2013

The user is becoming the main actor in the market, unlike in the recent period, driven by particular technologies with their specific virtues and inevitable shortcomings. People had to adopt to the many restrictions of business processes, computing architectures or standards and considered them quite natural. The sudden revolution in ICT has made the consumer, the user, the “center of gravity”.

According to Gartner’s model, information is beginning to play the role of a medium conducive to the action of “social” and “mobile” forces,

and mobile devices are becoming a platform for more effective use of social networks and new work methods. The social networks, for their part, offer unprecedented possibilities for interaction, while cloud solutions take care of the technical side of data delivery and the tools to work with that data.

Business is another actor in this concept. With an economic crisis underway, a Nexus of Forces is almost the only way for corporate clients of ICT to achieve the flexibility and adaptability necessary for survival, the analysts say. The Nexus of Forces in this way also sets the agenda for clients developing their IT strategies.

The role of the state.

Studies show: well-aimed and effective state support for IT can give palpable results in a very short time. For example, in Singapore state programs to create infrastructure and improve environment for IT business have led to an annual IT market growth of 38% between 2005 and 2009, with IT exports rising by 40% and employment in the industry by 18%.

In India an active position of the industry association NASSCOM, combined with state programs and projects, have been no less effective. In 2011 the country’s share of the IT outsourcing market was 58%. By the end of 2012, 2.8 million workplaces had been created in the nation’s IT sector.

The Russian IT market until recently had had to grow on its own. The state began to provide significant support only in the last few years, in part because of the enactment and implementation of the Russian Federation’s Innovations Development Strategy 2020.

The domestic market is now growing three times faster than the global average. But this trend must continue to receive support from the state so that quantitative advances of Russian IT will be accompanied by qualitative breakthroughs in key fields.

Developing ICT further requires an effective ecosystem that can:

- create demand;
- improve business conditions;

- develop human capital;
- make available financial capital;
- form an infrastructure.

In 2012 Russian IT market players agreed on a list of measures² for decisive progress in each one of these directions. The workgroup responsible for this report analyzed their wish list and found Russian high technology business to be thinking very much in tune with the government's intentions as set out in the Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

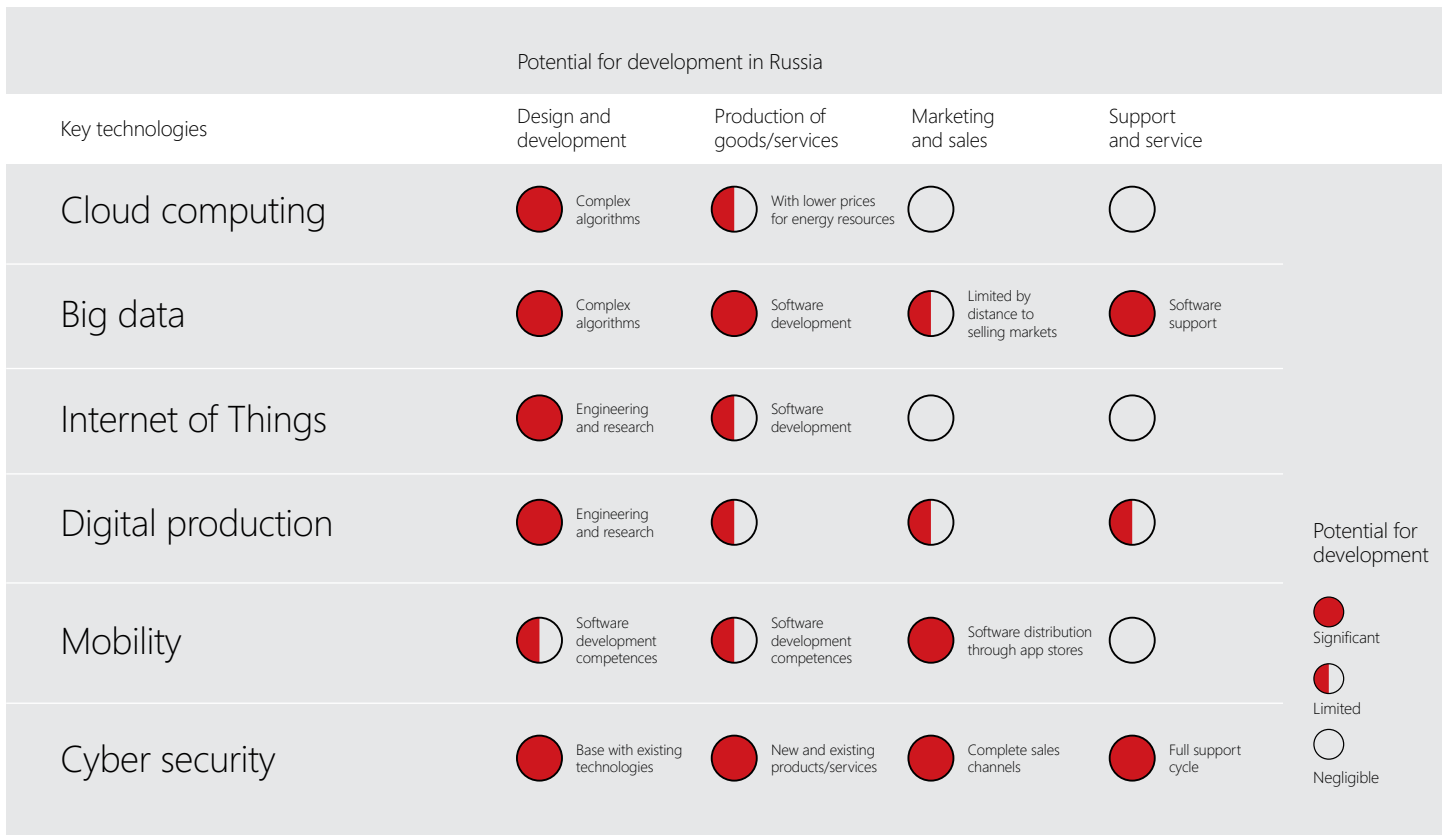
Of course, not all work of Russian IT companies has any relation to innovation. Much of the market is still devoted to import of equipment, consulting and bringing to market international developers' software. But the common proposals of Russian IT players are definitely innovation-oriented. The Strategy's success would, therefore, help solve many systemic issues and answer the market's expectations of government involvement, improving competitive strength of domestic ICT to face the new global trends and challenges.

Looking at the preliminary results for the first stage of the Strategy (2011-2013) in ICT, we can see some of these systemic problems dissolving. Noticeable progress has been achieved in helping IT entrepreneurs find venture investments and attracting

2 Source: "IT industry development in the Russian Federation. The view of the business community". AP KIT with McKinsey & Company. Moscow, 2012

Russia can make its contribution to development of key information technologies

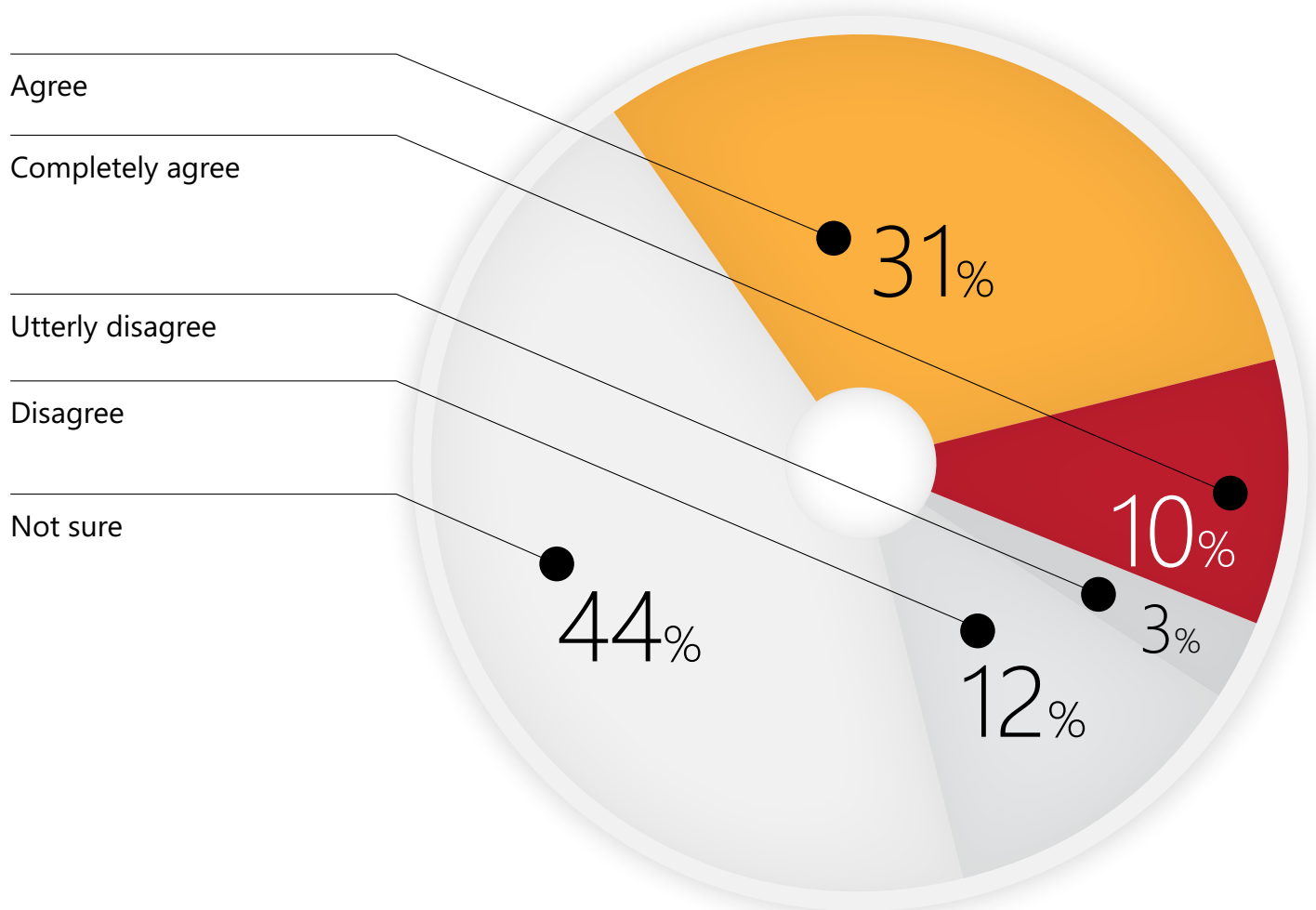
The country's ICT industry can play an important part in developing many modern technologies. Integration into the global innovation "food chains" would allow ICT and related sectors to grow faster, secure the most valuable technological and scientific competences for the country and improve Russia's international standing. Many IT market players believe that Russian competences in the field lie mostly in developing and designing complex processes and systems.



Source: "IT industry development in the Russian Federation. The view of the business community". AP KIT with McKinsey & Company. Moscow, 2012

Assessment of sector bias in the technological innovations business segment

Do you agree that the large presence of IT and Internet projects in the Russian innovations market is a form of systemic bias requiring, by some means or other, correction in favor of other venues?



Experts and studies (e.g. in regular issues of MoneyTree Report, published by PwC and RVC) point to a preponderance of IT and electronic commerce in the Russian innovations market in general and in venture investments in particular.

44% of surveyed players are not sure that intentional correction is called for (at least, yet). Those who do believe some correction is in order are very close in number: 41% (31% — "Agree", 10% — "Completely agree"). Convinced opponents of corrective measures are in the minority — 12% "Disagree" and 3% "Utterly disagree" with them, 15% in all.

One should keep in mind most of those surveyed were representatives of innovations companies in the sector of IT and the Internet, or else investors who consider that sector the most promising.

A broader examination of market players' attitudes to correction will be possible after the development institutions create and present specific instruments, financial and otherwise, to normalize the market, especially the venture investments market, without hurting companies in IT and electronic commerce.

Source: Survey of innovation market players, RVC, 11-24 April 2013

venture investors from abroad. A Russian venture investment market and an infrastructure for it have, on the whole, become reality. Moreover, IT and Internet companies have been the most active receivers of investments across the economy over the last two years, with a majority of venture deals done in that sector.

Further advances for ICT in Russia, opening the industry to innovation depend both on quality of the Strategy's second stage and productive interaction

between the market and state regulators, first of all, the Ministry of Communications and Mass Media.

Integration of strategic planning for the industry with the measures of the Strategy will be important in improving the market. Depending on conditions created for the IT industry, its contribution to GDP in 2020 may vary from 1.3% to 4%, and exports revenues, under a reasonably optimistic scenario, might exceed \$27 billion — twice the volume of Russia's arms exports in 2012.

More innovative business. Experts' recommendations

Expert interviews with players in the Russian innovations market have resulted in a number of suggestions and recommendations for better implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 in the Innovations Business area.

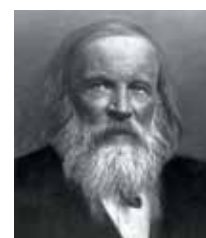
1. Expanding and improving the measures and instruments of state support for exporters of innovative products.
2. Developing the governmental and infrastructural support for intellectual property rights of Russian innovations in foreign markets.
3. Comprehensively assisting, e.g. financially, Russian technology companies' marketing efforts in foreign markets.
4. Removal of administrative barriers in currency and exports control and easing prototype exports.
5. Alleviating fiscal pressure on innovations companies with large expenditures on R&D and human capital.
6. Perfecting the system of R&D financing with involvement of business associations in application reviews and selection of winners.
7. Increasing the number of qualified investors for all project stages and all innovation fields, with joint efforts of development institutions and business associations.
8. Encouraging public-private partnerships and business investment in advanced training and re-education of technical specialists, e.g. in IT.
9. Ensuring, with combined work of the government and development institutions, a stronger and higher-quality "entry flow" of innovations start-ups.
10. Finding and promoting, with the government, development institutions and business, the best practices in corporate cooperation with scientific and educational bodies.
11. Creating across Russia, including on the level of federal regions, powerful R&D centers to draw in and generate innovations and make use of synergy. Such centers and innovators need to be provided with the resources they need, from venture investments to engineering expertise.
12. Increasing availability of investments for innovators at the earliest stages country-wide, including the regions.
13. Developing and simplifying the grant system to discover latent innovative potential and support innovators making first steps to commercialization.
14. Improving development institutions' support of early-stage investors and funds, assisting easier deal-making.
15. Organizing an informational and promotional program to inform businessmen at large of available support for innovators; media support of this program to instruct young innovators in making use of the channels available.
16. Assisting emergence and stability of companies selling "packaging" services to innovators.
17. Positioning business in general and especially business in innovations as a form of self-fulfillment for the young people on a national level.
18. Helping Russian science integrate into the global scientific process for better correspondence with major trends and market demand.
19. Simplifying further the process of opening an R&D company in Russia.
20. Actively involving the government and development institutions in stimulating the domestic mass innovations market to make its b2c segment a priority market for Russian innovators.

Effective science

Commercialization of research

“If there is no modern industry without science, then it’s also true that that there is no modern science without modern industry”.

D.I. Mendeleev, Russian chemist and discoverer of the Periodic law



Strategy

The strategic goal in scientific development is to return Russia its place among the world’s scientific leaders, creating an R&D sector for both fundamental and applied studies in areas of global significance and national importance that would be responsive to the needs of domestic and foreign business.

Making Russian science globally competitive requires a number of steps. Some of them are:

- improve personnel potential;
- increase efficiency in the R&D sector, e.g. by restructuring a number of scientific institutes;
- boost research potential in priority areas;
- create mechanisms and instruments for coordination between all parties involved in innovations.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020.

Science is at the core of an innovations-based economy. But its effect on the economy depends on a number of factors: success in fundamental and applied research, integration of research with higher education, transfer of competences to the real sector, cooperation between science, the educational system and industry, continuous supply of workers and, finally, a very measurable parameter — economic yield from government investment.

State expenditures for science have been growing through the 2000s. One figure will suffice: science spendings rose, in current prices, from 23.6 billion roubles in 2001 to 237.6 billion in 2010, according to the Federal State Statistics Service (FSSS). The state budget has always been science’s main sponsor, far ahead of private contributions. According to FSSS, in 2011 it provided 67% of the funding versus 27.6% from private sources.

Despite improved financing in the first decade of the XXI century, there were hardly any measurable signs of better efficiency. Despite certain brilliant successes of individual researchers, in 2010 only

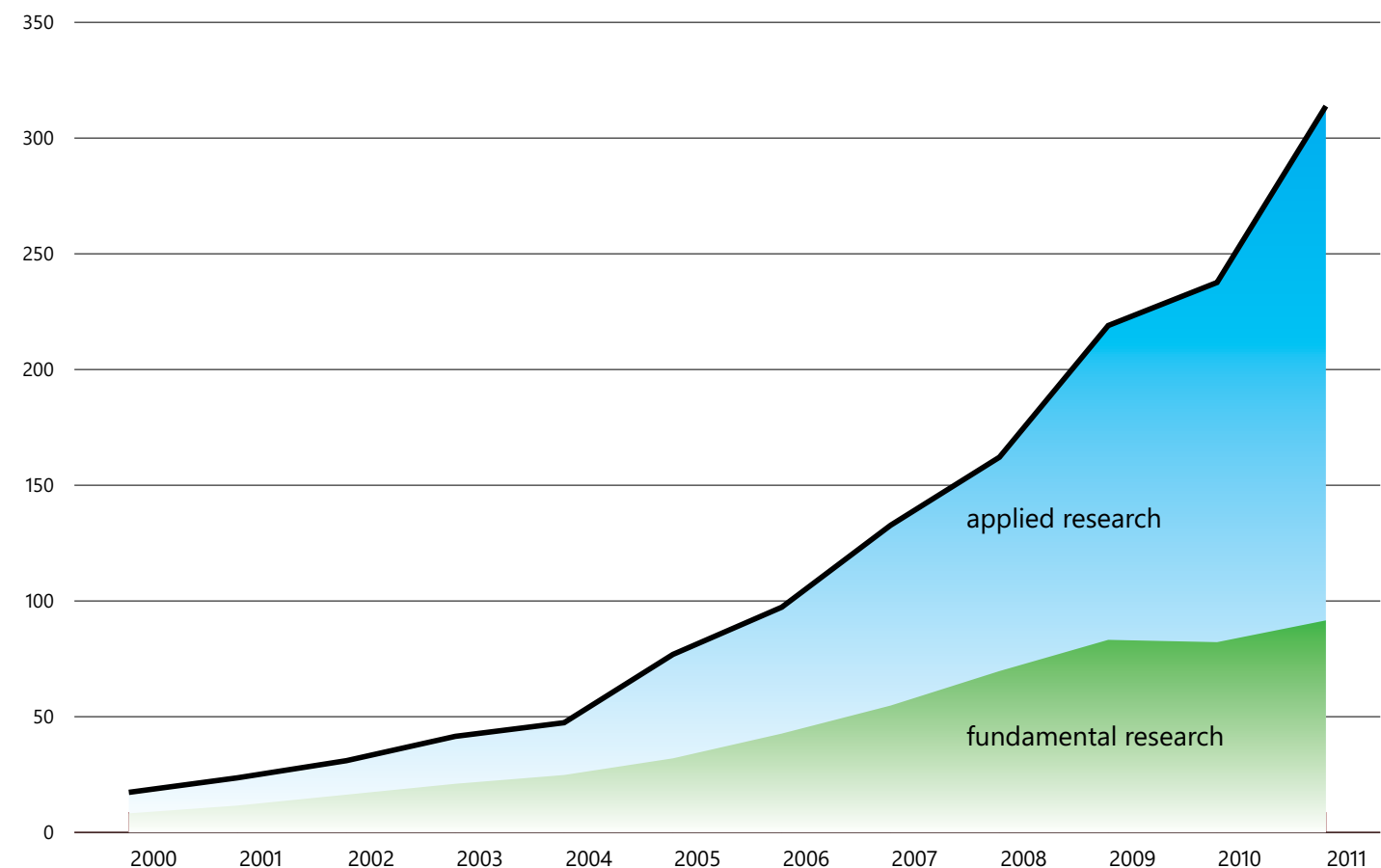
2.08% of articles in academic publications indexed in the Web of Science database had Russian authors. German scientists wrote 6.47%, French — 4.67%, Chinese — 15.08%. The ratio of active researchers to number of articles was also low. In Russia this figure was 15.3, in Singapore 3.5, in Germany and France 3.7, in Argentina 5.1, in China 8.1, in Japan 8.3. The number of references to Russian researchers' articles is likewise sub-par. The 2006-2010 Web of Science statistics say that an article written by or with a Russian author had on average only 2.4 references to it in other nations' publications. For comparison, this figure is 3.62 for Chinese articles, 5.12 for Japanese ones and 6.86 for German.

The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 makes effective science its special objective. The main development venues are: improving mechanisms for commercialization of research, restructuring

in 19,93%
of invention, utility model and industrial prototype license agreements, state enterprises, research institutes, design offices and higher educational institutions acted as licensors in 2012. This indicates a significant increase in their activity in intellectual property commercialization. For comparison: during 2004-2009 this parameter was between 7.6% and 8.9%.

ing and modernizing the knowledge industry, improving human resources, increasing government science spending with a system of competitive funding for fundamental and applied studies, developing the private portion of the sector to provide eventually over half of domestic research funding.

Funding for research from federal budget, RUB billion



Source: Rosstat (Federal State Statistics Service)

COMMERCIALIZATION OF ACADEMIC AND INSTITUTE RESEARCH

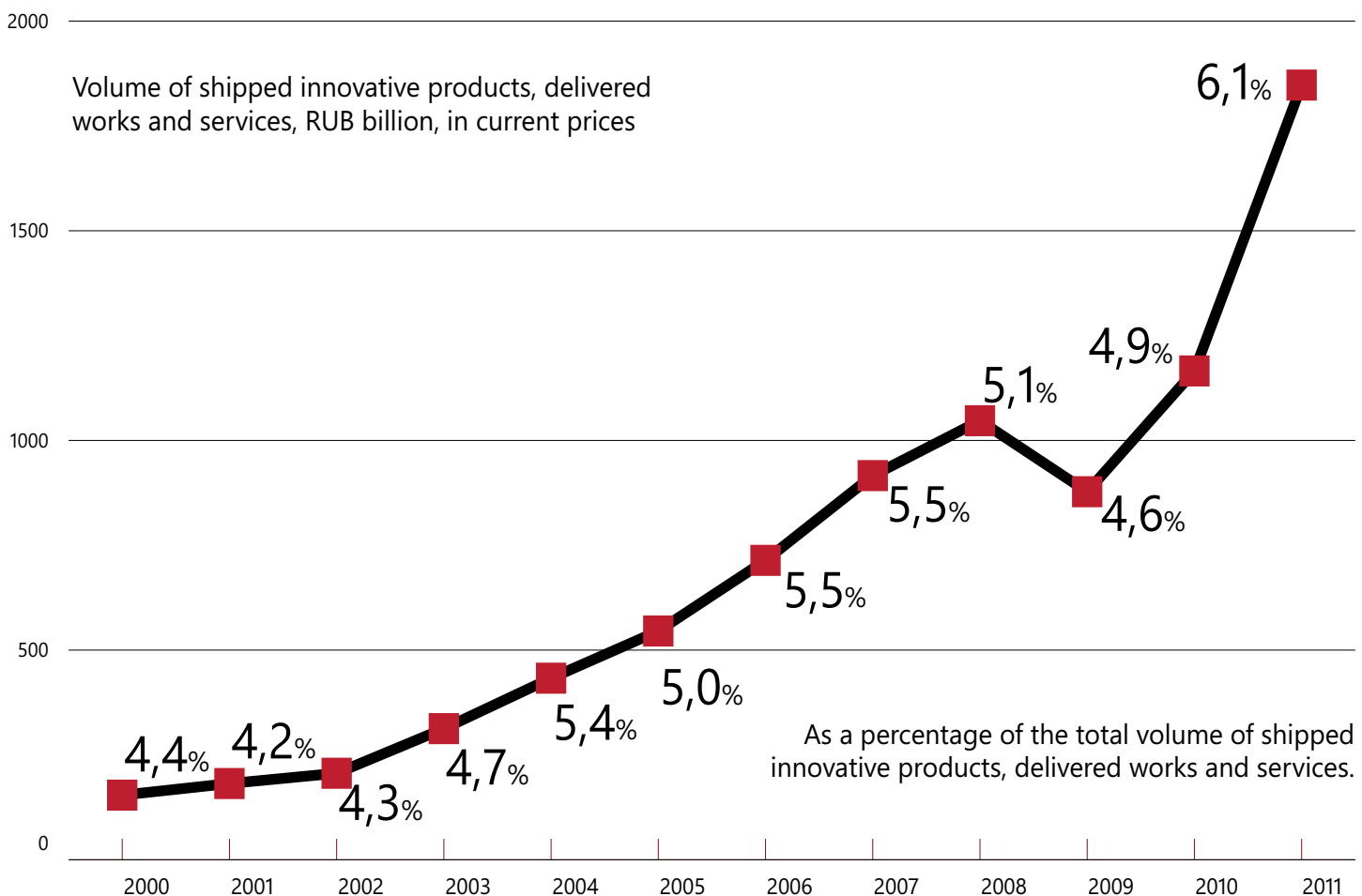
Improvement of legal and organizational aspects of commercialization.

In the 1990s two mutually exclusive myths about Russian science were in circulation among businessmen and research workers. One spoke of an enormous commercial potential of the Soviet scientific legacy, the other about its abstruse uselessness. That there were such radically different ideas itself points to importance of having practical tools for transferring competences from science, mainly budget-funded science, to industry. In Russia this transfer has been chaotic, and, in the absence of regulation, sometimes not quite legal for many years.

On one hand, there was a great mass of intellectual property, created on state money, and the researchers without too great a desire to make it sell. On the other, real sector companies often had to invent clever circumnavigation of legal obstacles to business application of state-sponsored findings. Obviously, building an innovations-oriented economy on such a semi-secretive base was difficult.

In this connection American experience offers an interesting case. Late in 1970s the US have run into their own state property crisis. The American government found itself the holder of exclusive rights to more than 30,000 unexpired patents. These were the results of R&D sponsored through one or another state program. Closely examined, only 5% of the patents turned out to have found commercial

Volume of innovative products, works and services in industrial production



Source: Rosstat (Federal State Statistics Service)

application. The rest were simply not used. The crisis ended after the Congress passed the Bayd-Dole Act in 1980, allowing research and non-profit organizations to receive, with some qualifications, exclusive rights to (and freedom to use as they saw fit) budget-funded discoveries. The state retained only the right to issue non-exclusive use licenses and to limit, in some very specific circumstances, the developer's exclusive rights if he is unable to find commercial application for the patent.

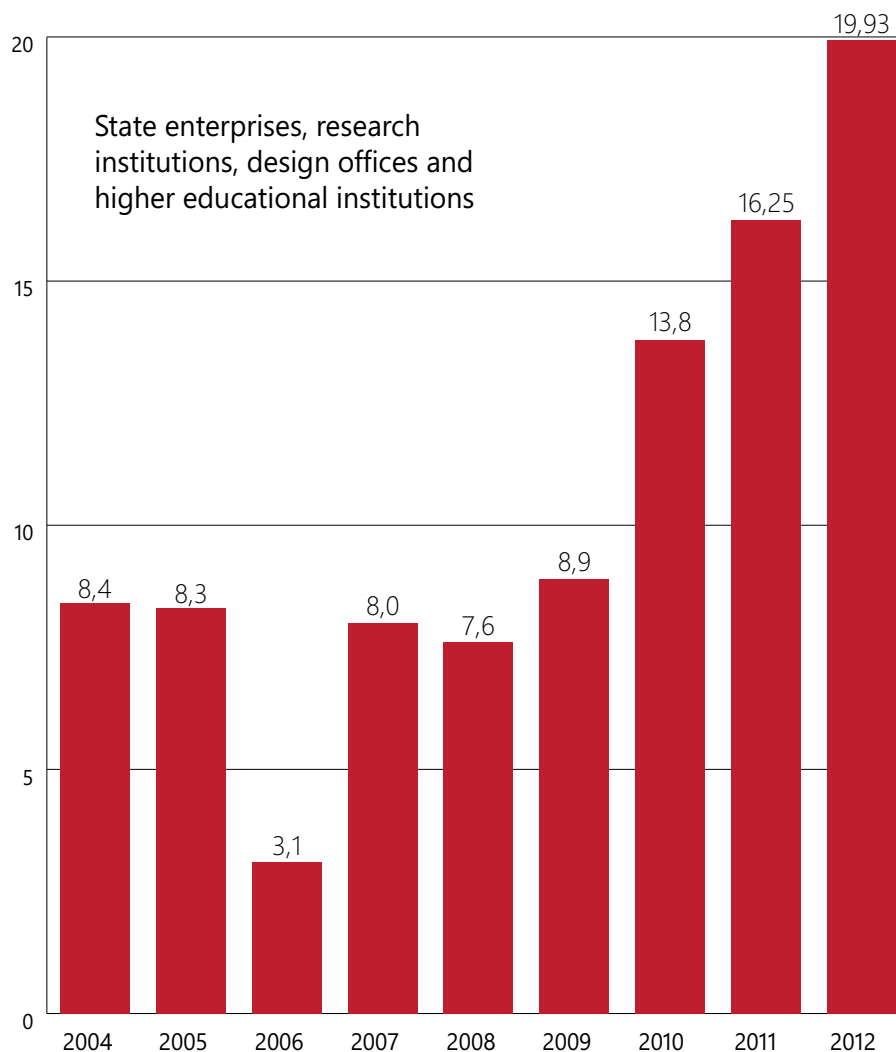
In the 2000s there was a similar kind of intellectual property crisis in Russia. The first steps to end it were made in 2009, with the passing on 2 August 2009 of Federal Law No. 217 — Business Ventures by Public Scientific and Educational Institutions. This was hardly sister legislation to the Bayh-Dole Act, but with its enactment budget-funded science and the private sector were able to meet as small innovations enterprises (SIE) for commercialization of research. Research institutes and colleges were permitted to participate in SIE with intellectual properties, investors — with money and physical properties. Federal Law No. 217 has some peculiarities making SIC difficult to build into the existing venture system, but it certainly played and continues to play an important part. By April 2013, there were almost 1500 SIE. Research and education bodies have been much more actively foraying in commerce. According to the Russian Agency for Patents and Trademarks, the number of registered agreements on use of intellectual property where colleges, research institutes or engineering bureaus owned the rights has grown from a token 3.1% of the total amount of agreements in 2006 to 19.9% in 2012.

At the same time technology transfer centers (TTC) were being founded at colleges and research institutes. Between 2006 and 2010 around 100 of them had appeared. TTC serve a very valuable function in an innovations ecosystem — they connect science and business. On one hand, they oversee rational use of the intellectual property and seek to sell it for profit. On the other, they find customers for research within the center. The famous Stanford University earns almost a quarter of a billion dollars a year this way: its TTC is its most importance funding source.

Activity is intensifying

Since 2009, state enterprises, research institutions, design offices and higher educational institutions have been acting as licensors in invention, utility model and industrial prototype license agreements.

Share in the total number of agreements, %



Source: Rospatent (Russian Agency for Patents and Trademarks)

EXPERT OPINION

“Our innovations companies have a common problem — young people don't go willingly into science. Investment funding can't usually cover serious salaries for young researchers. But salaries are not the only reason.

Respect for science has disappeared in the country. In high schools career counselors speak about everything but science. There is no system to select talented children and create conditions for them. In effect, only foreign companies have set up a systematic selection — but for their own benefit. They are the primary sponsors of nearly all student championships and tournaments. Seeing talents, they track them further.



ANATOLY BOKOV, GENERAL DIRECTOR OF SONDA TECHNOLOGIES

27% (up to 71,200)

is the increase in the number of young scientists aged below 29 that has taken place in the past three years. Their share in the total number of researchers grew from 13.5% to 19.3 % owing largely to the federal target program "Researchers and Teachers for Innovative Russia".

The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 proposes stimulating researchers and engineers to look for commercial application of their work. During the first stage of the Strategy, the Ministries of Education and Science, Justice and Economic Development drafted a number of bills based on the idea that effective practical use of a discovery is best secured by giving the discoverer the title to it.

The Ministry of Education and Science has prepared a series of amendments for parts 1-4 of the Civil Code. They transfer exclusive rights to intellectual properties for state-contracted research done before 1 January 2008, and belonging to the Russian Federation or one of its subjects, to the contractor, if the state customer has not found them practical application before 31 December 2012.

Government decree No. 233 of 22 March 2012, also specified rules for state right management with civic, military, special and dual-purpose intellectual properties.

A draft for a Government decree, "Approval of submission by owners of gratuitous simple (non-exclusive) license at request of state or municipal customers, and permission of state customers for certain transactions with exclusive rights to intellectual property under public contracts", has been prepared.

Financial support system for business-science-education cooperation.

When Russia was changing to a market economy in 1990s, connections between scientific institutes and manufacturing has suffered. During the Soviet period science was grouped into large Research and Production Complexes (RPC), supporting the entire innovation cycle, from fundamental studies to serial production. Soviet RPC included industry-specific research institutes, engineering bureaus and production floors, allowing coordinated work at every step. Engineering followed research and was followed by prototyping, with technical documentation prepared next and trial and small-scale product releases forthcoming. This process resulted in tried and tested industrial technologies that could be handed over to manufacturing for serial production.

At present, this level of integration of science and industry exists in a handful of sectors (mostly in defense, spottily — in mining and manufacturing). In the second half of the 2000s logic of market play itself has pushed a number of large Russian companies to acquire scientific assets. Before that time business had cared only for attractive real es-

Intellectual activity

(previous year's data is provided in parentheses)

Country	Input		Output	
	R&D spending in 2010, as % of GDP	Involved in R&D in 2010, per million people	High-technology products in 2011, as % of industrial export	Patent applications (residents) in 2011, pcs.
Russia	1,16 (1,25)	3 092 (3 091)	8 (9)	26 495 (28 722)
USA	2,9* (2,84)	n/a	18 (20)	247 750 (241 977)
China	1,7* (1,47)	863* (1 199)	26 (28)	415 829 (293 066)
Japan	3,36 (3,47)	5 180* (5 189)	17 (18)	287 580 (290 081)
Germany	2,82 (2,82)	3 979 (3 850)	15 (15)	46 986 (47 047)
France	2,25 (2,26)	3 751* (3 666)	24 (25)	14 655 (14 748)
Great Britain	1,76 (1,86)	3 794 (4 154)	21 (21)	15 343 (15 490)

* — data is provided for 2009

Source: World Bank, Key development indicators 2013

tate that some research institutes owned, having for the most become corporations in the 1990s (except the institutes within the Russian Academy of Sciences network). Now large industrial companies are turning to the institutes as a base for private R&D complexes. For example, in 2007 OAO TMK (Russia's largest manufacturer and exporter of steel pipes) bought the Russian Research Institute of the Tube&Pipe Industries in Chelyabinsk — the only Russian research institute specializing in pipe-manufacturing technologies. Basic Element (diversified industrial group made up of over 100 Russian and international companies and facilities operating in a range of sectors) acquired in 2008 one of the biggest institutes in transport construction — TsNIIS. In 2010 RusHydro (one of Russia's largest power generating companies) bought the Hydroproject research institute.

But raising collaboration to a new level, with new principles is becoming a necessity. Reflecting this, the Strategy sets a clear objective: create permanent support mechanisms for collaboration between business on one side and education and science — on the other. These must include financial incentives. The goal is to stimulate large business to create comprehensive science-intensive projects for high-technology manufacturing, involving in them colleges and research organizations for R&D.

Government decree No. 218 of 9 April 2010, titled State Support for Colleges and Organizations in High-Technology Manufacturing, laid the foundation. Support will be given to competitively selected organizations that order R&D, entirely at their own expense, from Russian colleges. Between 2010 and 2012 19 billion roubles were allocated in the budget for this initiative — 6 billion in 2010 and equally in 2011, 7 billion in 2012. 93 comprehensive projects in high-technology manufacturing are currently underway. 89 companies and 64 colleges are involved, receiving 15.6 billion roubles in state financing. The companies themselves, having won the contest, are investing 17.9 billion.

In 2010-2012 almost 4,000 college scientists and 4,300 young researchers, graduate and undergraduate students, participated in the projects.

SUCCESS STORY

“NEVZ-KERAMIKS”

INNOVATIVE PRODUCT

products made of nanostructured ceramics, a material that can be used in any field from medicine to microelectronics and defense industry.



INVESTORS

RUSNANO (590 RUR million), “Novosibirsk Electrovacuum Plant – Soyuz” Holding Company (HC OJSC “NEVZ-Soyuz”)

INVESTMENT OUTCOME

industrial production development in Novosibirsk, import substitution in the field of ceramic substrate production for electronics

“Novosibirsk Electrovacuum Plant – Soyuz” is an enterprise with over 70 years of history, which was initially started as “Svetlana” plant: during the Great Patriotic War, its equipment and staff were relocated to Novosibirsk from Leningrad. By late 1980-s, the plant had become a complex, diversified enterprise with a developed technical and technological infrastructure and different types of production – ceramic, glass, metallurgic, thermochemical and assembling manufacture.

In 2011, a need emerged to reorganize and reequip the company's production and technical facilities and to elaborate new advanced nanostructured ceramics manufacturing technologies. As a result, a decision was made to make this an independent business. Thus, CJSC “NEVZ-KERAMIKS” came into being as a joint venture with RUSNANO. Around 1.5 RUR billion was invested in the new company.

Nanostructured ceramics is a material with a vast number of applications, the global market of which, according to expert forecasts, will reach \$73 billion in 2015. NEVZ-KERAMIKS designs and produces ceramic insulators for the electric power industry, isolation valve parts for the oil and gas industry, armored ceramics used in protective clothing, and armor panels. The enterprise's largest segment today is ceramic substrates for the electronic industry

(this is the base material used in the manufacture of transistors, hybrid integrated circuits and other electronic components). So far, two-thirds of this segment in Russia depend on import. However, the situation can change when NEVZ-KERAMIKS reaches its design capacity. The plant's revenue from the sales of substrates made from nanostructured ceramics for electronic devices is expected to be approximately RUB 575 million in 2015.

As part of a joint project, it is planned to expand production of several product types that are in high demand on the market today. RUSNANO's investments are directed at production of advanced products, such as ceramic implants used for surgical treatment of spine injuries, those used in dentistry and to treat various diseases and joint injuries. In the spring of 2013 NEVZ-KERAMIKS successfully conducted a series of technical, toxicological and other research projects on an innovative product that has no equivalents in medical practice — spongy ceramic implants for cervical spine, which were provided to Novosibirsk Research Institute of Injury Treatment and Orthopedics for clinical testing. The institute's leading surgeons performed the first surgery in Russia involving installation of trial implants made of nanostructured bioceramics, manufactured by NEVZ-KERAMIKS.

SUCCESS STORY

NanoDerm-profi

INNOVATIVE PRODUCT

Nanocosmetics under the NanoDerm trademark is an effective product to fight the early signs of skin aging



INVESTORS

RVC Seed Fund and Rusnano

INVESTMENT OUTCOME

Since the beginning of the project, NanoDerm-profi's revenue has exceeded RUB 53 million, sales in Russia have started, and the brand has started to move to foreign markets

NanoDerm-profi was founded in 2011 with the support of RVC Seed Fund and Rusnano. The company became Russia's first and only innovative enterprise in Russia to develop and implement nanotechnology in dermatocosmetology. The company produces a unique cosmetic product, NanoDerm, which effectively fights the early signs of aging. The brand's formula is based on a transdermal system with a nanocomplex of unique natural ingredients.

One of the most important and complicated tasks of cosmetology today is overcoming the dermal barrier and delivering active components that allow preservation of the health and functional activity of the skin. Modern technology allowed us to solve this problem on a completely new level. The company's scientists developed brand new transport systems just 1.7 nm in size that easily deliver active components into any skin cell, giving it a new life impulse.

The developers managed to place monomers of hyaluronic acid into a transport capsule smaller than two nanometers in size. This is the first part of the technological process. The second part starts when the capsules with nutrients produce a 50 nm nanosome. This nanosome easily penetrates the skin's protective barrier, breaks down into components up to 2 nm in size but preserves the structure created. The components "land" on the cell's surface like space ships and stick to its membrane. The system works as a "syringe" that "injects" the active molecule di-

rectly into the cell's cytoplasm. The developers achieved delivery of necessary components not only into the tissue, but into the cell itself, where necessary substances are synthesized, in particular, hyaluronic acid and collagen. They managed to increase monomer concentration in the cytoplasm around the nucleus, which causes a good synthesis of hyaluronic acid. As a result, its input into the intercellular space increases: the skin is saturated with necessary components creating an anti-aging effect.

Usage of NanoDerm cosmetics also results in additional detoxification. NanoDerm cosmetics passed all necessary reviews and conforms with the best global standards, having passed Rospotrebnadzor's certification of nanostructures, safety and product effectiveness. NanoDerm cosmetics stands out from other cosmetic lines thanks to its highly active and hypoallergenic qualities. Clinical trials showed that NanoDerm increases effectiveness of cosmetics by 5 times by the hydration indicator and allows to rejuvenate the skin by at least 5-6 years. The enterprise is based at Ufa's cosmetic factory "Zhespar-bios" (NanoDerm line now has 77 product items.)

NanoDerm-profi's revenue from the start of the project came up to over 53 million rubles. There is a constant flow of contract delivery of the merchandise to leading pharmacy chains; the company is starting to deliver to the Ashan hypermarket chain. The first delivery of the merchandise to Europe is scheduled for May 2013.

Their remuneration amounted to about 3 billion roubles.

This kind of teamplay, in addition to direct economic benefits, can have a "side" effect of invigorating scientific efforts per se. In connection with the project, 1,800 research and engineering articles were published between 2010 and 2012, 18% of that number in foreign academic journals. 475 patents were filed for on the R&D results obtained by entities and colleges, 283 received.

2,500 new workplaces were created in 2012, with almost 1,500 for specialists under 35. This includes employment for former students, graduate students, young specialists at participating colleges. Between 2013 and 2017 around 9,500 more workplaces will be created.

Considering the positive results of these initiatives, the Government, with its 24 May 2011 decree No. 411 — Amendments to 9 April 2010 Decree No. 218 — has extended the program of state support to 2015. Federal budget in 2013 allocates 5 billion roubles to the program, in 2014 — 6 billion, and in 2015 — 7 billion will be invested.

In December 2012 ended the third round of selection of companies deserving subsidies for comprehensive projects in high technology manufacturing. 71 project had been selected, with a combined 12.8 billion roubles of investments asked for (as of 26 February 2012, 5 companies had decided against signing agreements). The volume of improved, high-technology products and services made with the sponsored R&D should reach 425.2 billion roubles by 2020.

RESTRUCTURING OF R&D

Creation of new research centers in the regions.

For Effective science the Strategy plans to expand support of fundamental and applied science research at colleges, bring closer instruction and subject studies, develop competitive universities, provide conditions for new research centers based on the most effective organizational structures.

Presidential decree from 7 October 2008 — Pilot

Project for a national research universities — introduced a new, competitively awarded status for colleges — National Research University or NRU. National Research Nuclear University (MEPhI) and the Moscow Institute of Steel and Alloys were awarded the status directly. The NRU designation is for colleges with not only effective instruction but integration of that instruction with research programs in their walls. The first competition in October 2009 allowed the Ministry of Education and Science to select 12 qualifying schools. In April 2010 15 more received the NRU prefix.

A concept for development of National Research Centers — important scientific institutes with ground-breaking work in promising areas of science and technology, converting their research to products — was also adopted. These are state institutes with a world-class research base that the Government sets up for prioritized venues of study, strategic projects of national significance, federal level concentration of resources and personnel and coordination of innovating efforts. NRC were to become part of a unified innovations production cycle including research and prototyping.

The National Research Centre “Kurchatov Institute” became a pilot NRC project, following Government decree 1195-p of 15 July 2010. The Institute-based NRC aims at faster practical implementation of research and a full innovations R&D cycle in Nano materials and systems and Energy and energy conservation.

This was not only an important step in improving research in those venues but also a model for a network of NRC in innovative fields. Lessons learned here on organization of NRC will allow to better target areas conducive to this system, determine a procedure for creating and developing an NRC network.

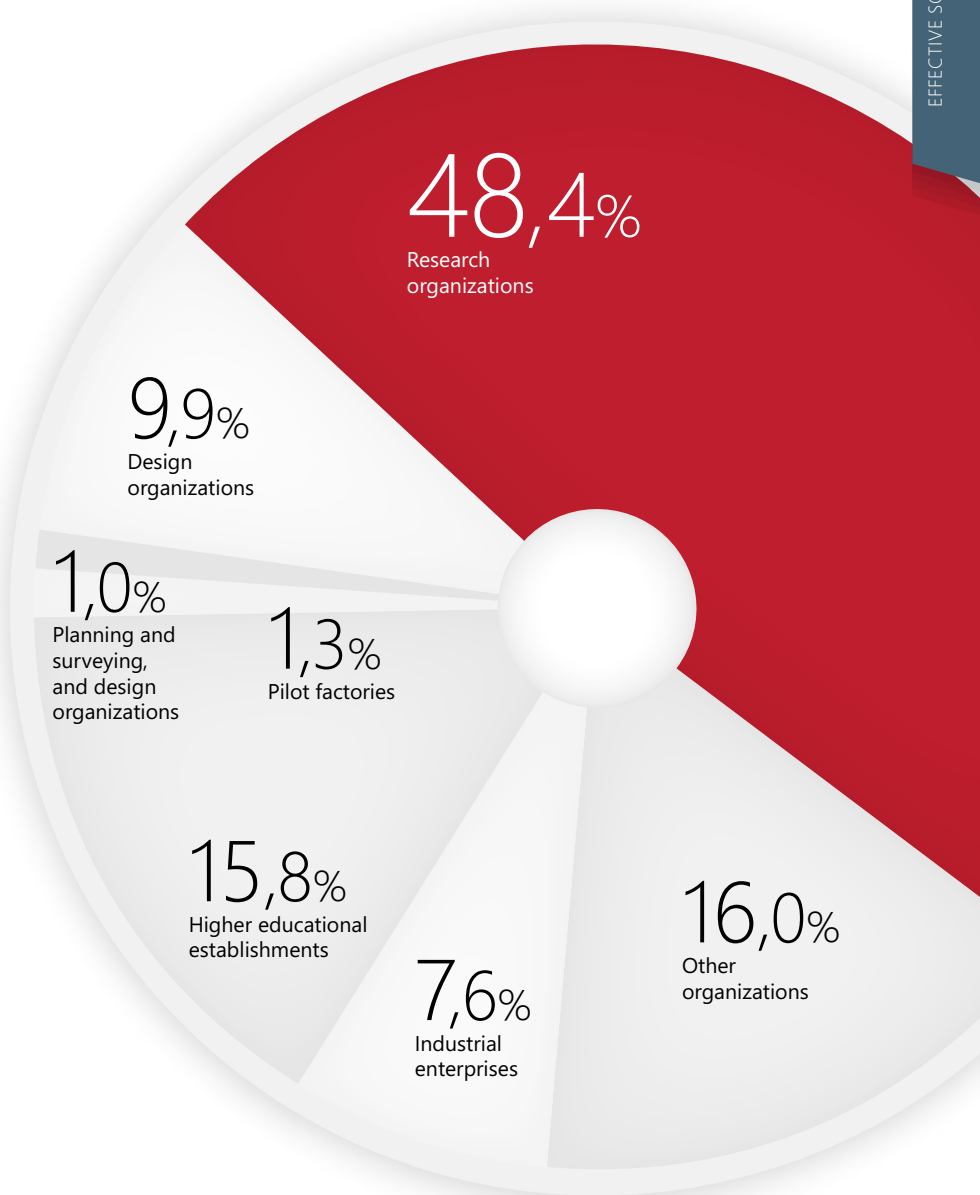
The experience gained will have a further use. For example, the Ministry of Industry and Trade has drafted two federal laws: National Research Center Zhukovsky Institute and Amendments to Legislation for National Research Center Zhukovsky Institute Law. They allow an NRC in aviation. The drafts were presented to the Government in February 2013.

HUMAN RESOURCES FOR SCIENCE

Overcoming the legacy of the 1990s.

In the 1990s Russian science suffered greatly from chronic lack of money, falling respect for research and study, elimination of a number of institutes and loss of many established research communities. There was a constant “brain drain”, with the best-qualified specialists of the most productive age

R&D organization structures in 2011



Source: Rosstat (Federal State Statistics Service)

736,200 people

were engaged in R&D in Russia (data from 2010), including 368,900 actual researchers. By this factor, Russia takes one of the leading places in the world, after China, the U.S. and Japan.

EXPERT OPINION



“In the last few years Russians have begun to understand how to create innovations companies. Capital has started to move, connections between grant financing to investors have formed, and start-up founders know now how to attract initial investments. But there are issues. Federal law 217, helping colleges become more active in R&D, still is not working with full strength. Colleges have a permanent participation in the capital of start-ups they help create, and that prevents them from attracting investors. The government should think how to change legislation to allow colleges create real spin-off projects. An infrastructure for college innovations needs to be improved, Russian researchers and projects need help communicating with advanced innovations ecosystems in other countries. Colleges should be motivated to spend not only on equipment, but on developing incubators and techparks, send students on internships abroad.

IGOR BALK,
MANAGING DIRECTOR OF
GLOBAL INNOVATION LABS

emigrating. According to the Minister of Education and Science Dmitry Livanov, between 1989 and 2004 around 25,000 scientists have left the country permanently, 30,000 on temporary contracts.

The generation gap this created in the Russian science is difficult to close. In 2000-2010 the share of scientists under 29 has grown, but until 2006 the next age category, 30 to 39 years, has expanded,

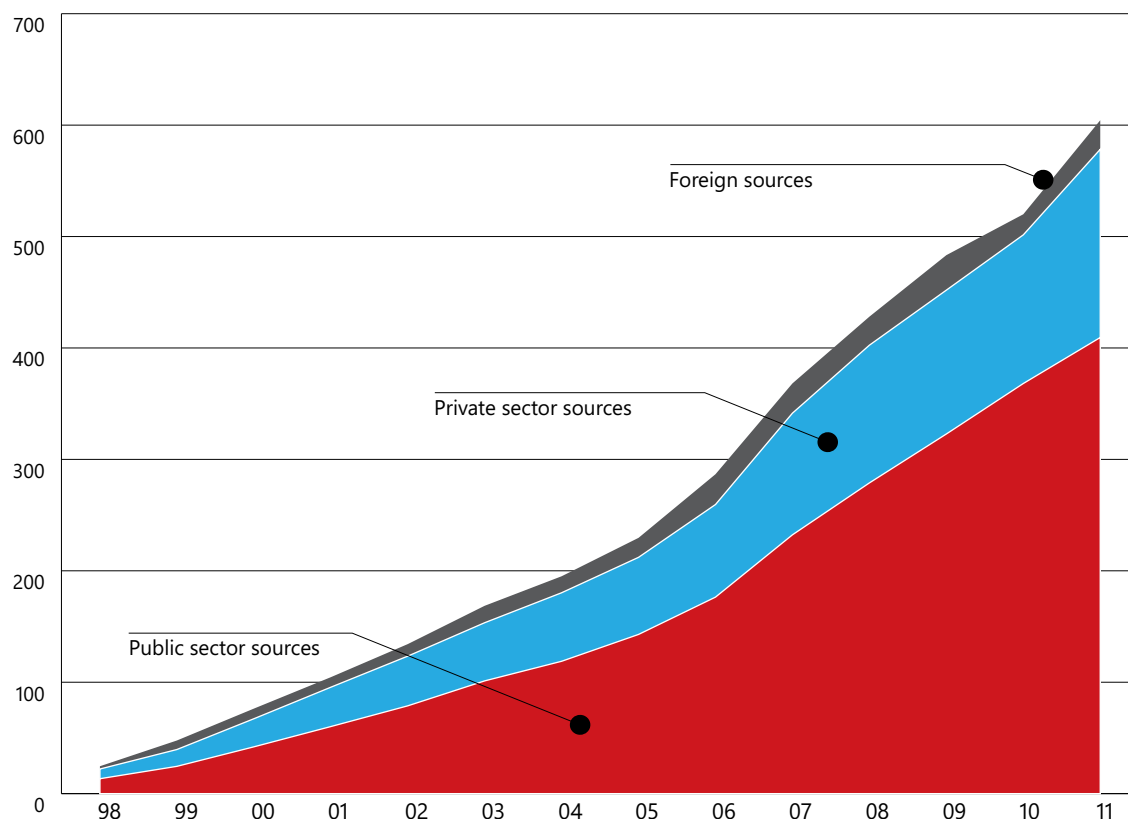
pointing to research institutes' inability to retain young specialists. At the same time the share of researchers aged 60 and older grew from 20.8% to 25.2% over 8 years.

One of the Strategy's most strategic objectives is ensuring availability of science workers, finding young prodigies of all educational stages and developing scientific schools without losing their accumulated know-how.

Achieving this objective requires:

- favorable conditions and incentives for young researchers;
- their continued scientific involvement, e.g. by providing a work environment that would demotivate them from emigrating without actual mobility bans;
- support of existing and establishment of new scientific schools for researchers of different generations;

R&D internal expenses by financing sources, in billions of rubles



Source: Rosstat (Federal State Statistics Service)

- further integration of college and research institute science, a unified structure for fundamental and applied studies with dynamic scientific schools and wider practice of combining teaching with research;
- new models of graduate instruction following proved international standards;

EXPERT OPINION

“Small and medium-size innovations companies is not the only, and for Russia far from a most important, way of developing new industrial technologies. A great number of cutting-edge technological solutions are developed in corporate infrastructures. There are powerful research centers working for the Federal Atomic Energy Agency, the Federal Space Agency, United Aircraft Corporation. The Soviet system of producing know-how and implementing it into practice worked efficiently, especially in sectors with comprehensive manufacturing — defense first of all. Where manufacturing is alive today, the scientific infrastructure around it is stirring, too. Everywhere else it has in effect been lost, and the government’s attempts to restore it haven’t produced system-wide results so far. For example, the network of shared use centers for high-technology equipment, created under federal special purpose programs, has only local effect yet. This expensive equipment is fully used in just a few centers that have managed to break through bureaucratic hurdles and organize constant maintenance with qualified technicians and supply of expendables and spare parts. Shared use centers still do not work as readily available sources of research equipment. The handful of small-size companies created for production of high technology goods and service we have are absolutely unable to afford research there. General business conditions in the country undermine any company’s cost-effectiveness. And an innovations business is less viable yet because of its significant risks. As a result, even the few operating infrastructural centers are beyond private companies’ reach. On the other hand, large corporations, forced into innovations by the government, sometimes (rarely) make use of shared equipment centers for a fee. On the whole, to restore the system of research centers, the government needs to:

- 1) stimulate demand for R&D and creation of competitive high-technology products;
- 2) improve legislation for a better business climate.

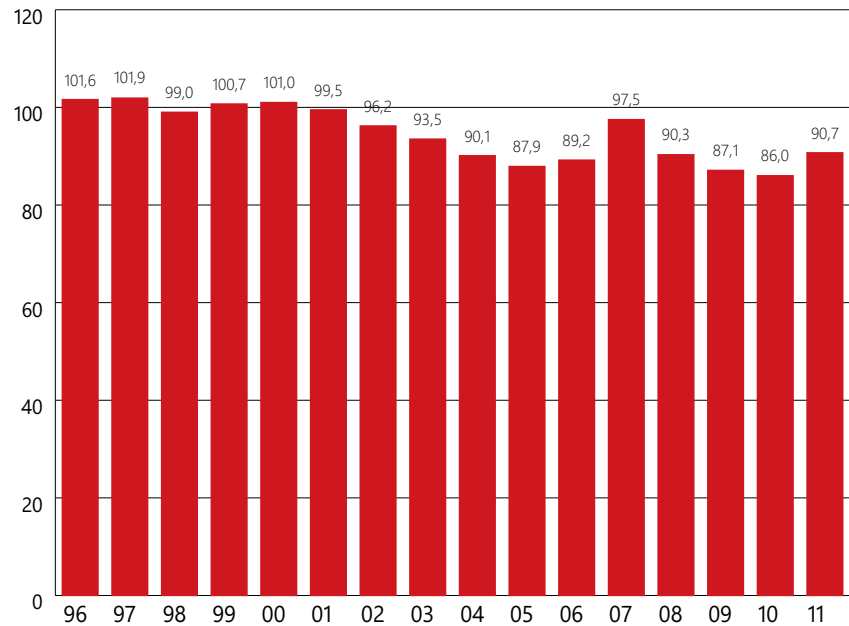
Easier conditions for starting and running a business would inevitably create demand for research centers’ services, and these centers themselves are small-size companies.



DENIS ANDREYUK,
FOUNDER OF AGENCY 110

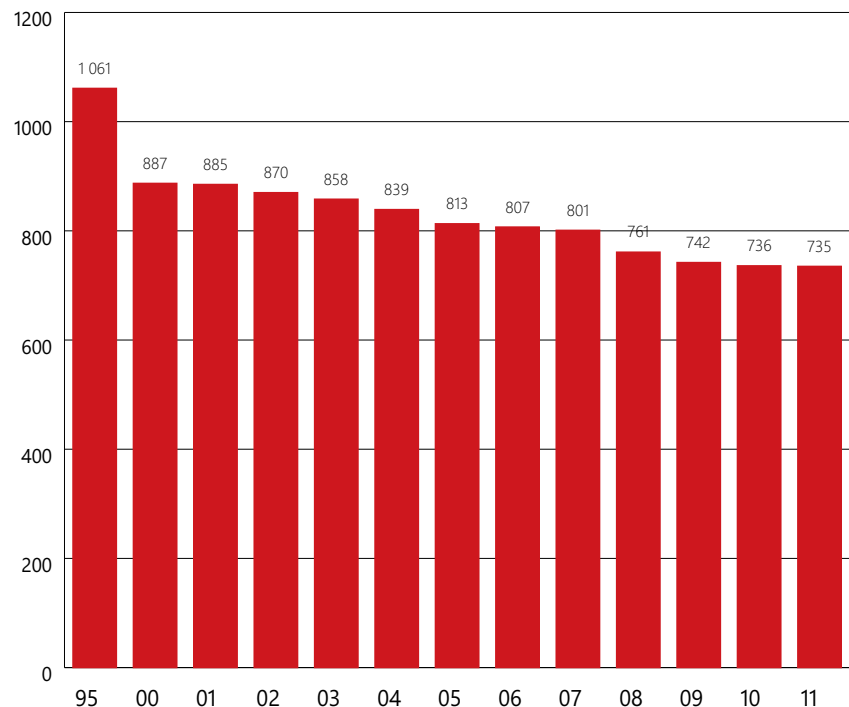
Dynamics of the number of R&D organizations

1995 = 100%



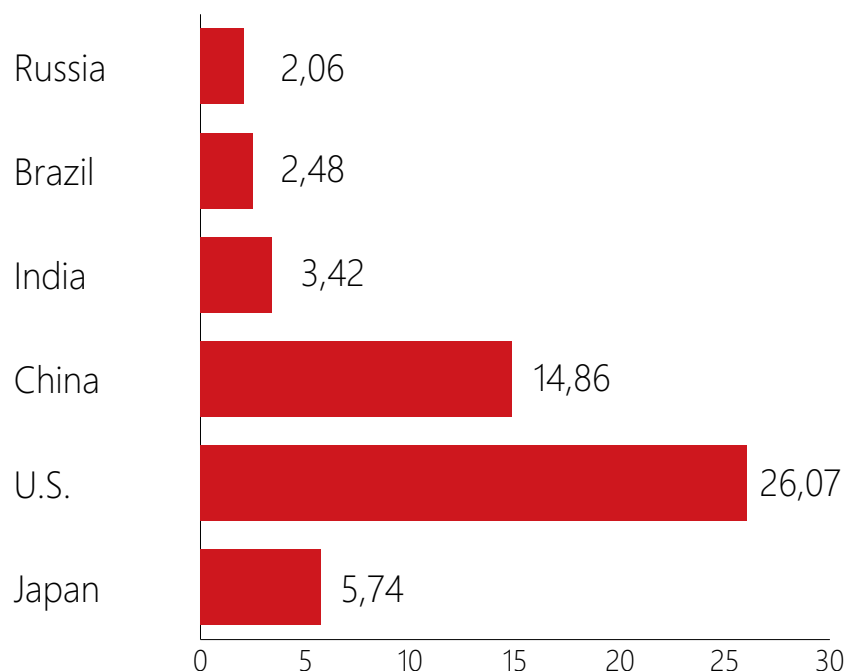
Source: Rosstat (Federal State Statistics Service)

R&D staff, in thousands of people



Source: Rosstat (Federal State Statistics Service)

Proportion of countries in global number of publications in scientific journals as indexed in the international database Web of Science (2011)



- involvement of eminent Russian and foreign scientists for graduate-level academic work and program management at research institutes.

During the Strategy's first stage the federal special program Research and Academic Staff for Russian Innovations 2009-2013 was the most important instrument for achieving these objectives. Its initiatives should by the end of 2013 result in:

- average researcher age 3-4 year younger;
- share of highest-qualified researchers 2-4% larger;
- share of highest-qualified faculty in academia larger by 4-6%;
- a system of youth motivation for science, education and high technologies;
- Russian share of academic articles in the world's leading publications 1-1.5% greater;
- more science and education bodies using the practices of leading universities abroad;
- more significant international recognition for Russian higher education.

The Strategy connects rejuvenation of personnel with a parallel reduction in ineffective workers and departments. During its first stage peer re-

Types of R&D organizations in public and entrepreneurial sectors

Type	Public sector	Entrepreneurial sector
R&D institutes	1 109	598
Design, planning and design, technological organizations	65	287
Construction planning and surveying, and design organizations	6	32
Test facilities	33	14
Industrial enterprises	n/a	280
Other organizations	244	239
Total	1 457	1 450

Source: Rosstat (Federal State Statistics Service)

views and examinations of accreditation practices and standards began, meant to replace ineffective personnel. In April 2013 the Ministry of Education and Science presented for public discussion a draft of a Highest-Qualified Scientists Accreditation Concept. It aims at effective reproduction of highest-qualified personnel, e.g. for innovations development. Its authors expect the Concept, corrected and improved, to serve as a basis for a Government-approved pilot project that would test no later than 1 August 2013, the new accreditation model.

Over the last years compensation in state science, including fundamental science, has grown. In 2010 average monthly wage in R&D was 25,000 roubles, in 2011 — 33,100 roubles. The Strategy calls for raising the figure to 126% of the country's cross-industry monthly wage by 2016 and to 130% by 2020. Decent salaries should both drive and be driven by improved efficiency. The first stage of the Strategy involves restructuring to free the money for wages, the second — increased private funding of R&D. This approach can succeed only if the salary reflects the researcher's or the workgroup's results. The state science sector will also benefit from a results-based system.

The numbers of scientists in the country are falling overall, although slower than before. Improving personnel ability in science and technology requires devoting support to workgroups capable of world-class research, proper setting of objectives, personal motivation.

Removing restrictions on foreign faculty at research institutes and colleges.

Federal law 385, Legislative Amendments, enacted on 23 December 2010, created preferential employment conditions for highly qualified foreign specialists working or contemplating work in Russian science institutes and colleges.

The bill made attracting specialists from abroad much easier. Foreign teachers and researchers no longer need employment permissions, if they are invited by state-accredited colleges, R&D centers, state academies of science, research institutes and

other organizations in the Government-approved list. Russian science, professional education and health care, other organizations in development and experimental research or those preparing workers for important scientific and technological fields also may, if state-accredited, invite foreign specialists, provided they are prepared to offer them salaries of at least one million roubles a year.

In 2012 the Ministry of Education and Science asked the Federal Migration Service to suggest improved residency conditions for family members of such specialists and easier procedures of granting the specialist status. The Federal Migration Service replied with a draft of a federal law amending the 25 July 2002, bill 115 — Legal Status of Foreign Citizens in the Russian Federation. The draft is now under review.

EXPERT OPINION

“Many things have changed in the last few years. As late as five years ago there were mostly people in their 40s and 50s attending events for start-up founders and innovations — those who had started working with R&D in the late 1990s — early 2000s. Now the government is bringing around many young guys eager to found companies. This is important — people are the foundation of an innovations-based economy. There have been very appreciable changes for the better in this respect.



There is real money in the innovations industry now. If you have a great idea and “package” it well, you really can raise money to make it reality. But grant support for start-ups needs more work. State organizations that award grants prescribe down to the last detail what an innovator needs to spend that money on. Often these instructions are not sensible and don't consider the real situation of a project. Grant winners have to contrive clever tactics around them. Yes, the government needs to control how budget money is used. But then these supports' efficiency should be re-evaluated. At the moment state organizations look at companies' tax deductions to see they are performing well and expect an R&D business to return what was invested in it within three years. That is a wrong-headed approach. We need a different method for long-term projects.

The government should approach demand for innovations differently as well, especially in health care. The Russian health care system needs renovating its material base — substandard, and in some regions none at all. The health care reform now underway is helping to solve that problem, but introducing innovations are a second priority. There are more urgent objectives. So it would be wrong to criticize the government now. But in 5 years' time, when the most important issues are done with, we will have to start using new technologies to fight disease. And to make that possible, the medical sector should start adopting them today. That requires a roadmap of health care's needs in the long run. It would let developers know what health care will demand so they can start working.

If demand is clear, money, projects and investors will all appear. The way things are, the R&D biotech market in the country is small, does not know what needs to satisfy, there is literally a handful of people who have made money in medical innovations, and we lack competences and connections to go to Western markets. Good ideas that come up stay on paper.

ALEXANDER KHASIN,
CEO OF NANOBALACE AND HEAD OF MEDICAL START-UP ASSOCIATION MEDSTART

Global academic mobility for undergraduates and graduates, researchers and faculty.

The measures to improve academic mobility in science and education were closely connected in 2012 with Russia's international obligations and direct partnership agreements with foreign schools. Over 20,000 students and faculty members participated that year.

In 2012 the process of selection of undergraduate and graduate students eligible for Presidential scholarships was optimized. The scholarships are for studying abroad. Unlike before, in 2012 preference was given to candidates in prioritized R&D development venues and in scientific fields chosen by the Government's Science Scholarship Council.

EXPERT OPINION

“The venture industry in Russia follows global trends, including the segment of pharmaceuticals and biotech. These industries are undergoing changes everywhere in the world. There is much less capital offered in venture investments, especially in Europe. As a result the fund's investment has decreased markedly, which extends exit times to nine years on average. That is a very long time, because a fund's "life expectancy" is usually 10, at most, 12 years. Average revenues of venture funds in the world have dropped below zero, they are in the negative. Unfortunately, that trend is ongoing. The only good news statistically is better gains from exits. That it logical — the more expensive the "entry" and the process, the more you want when recouping investments.

There is a tendency, particularly in Russia, for venture funds to be caught in a double bind, because government regulations, especially in biotech and pharmaceutical, are getting stricter. To satisfy these requirements an investor needs to spend more per project, do more research. Meanwhile, with the crisis and rising risks, potential strategic investors, the big players in pharmaceuticals, have gotten very careful. The development template they use when evaluating investments has also changed dramatically. Before, in 2006-2007, a strategic investor could step in at the late pre-clinical stage, but now they come no earlier than at late clinical trials. For the investor leading the project that means having to put additional tens of millions of dollars in every drug.

The Russian situation is different in that the venture market is only emerging. We are used to getting results after a year or two. But it cannot work that way. Besides, in the Russian pharmaceutical sector there is still no consumer market. The government is too big a player, and despite various programs going, we don't see actual demand for innovations in our field. Another reason is that the pharmaceutical start-ups market in the country is only coming together. We are at a stage the Western market passed 20-35 years ago. Finally, Russia still has not absorbed the open innovations ideology. Domestic companies in pharmaceuticals prefer to lay down their own pipelines, have home-grown R&D. They don't readily buy start-ups.

In this situation the Ministries of Health Care and Industry and Trade could, I think, formulate a more clear demand for innovative products — both for the health sector's current needs and provisionally. They should work with the experts community to articulate demand for new drugs. If large corporations show a willingness to buy innovative products, and state regulations begin supporting R&D, we will linkage between companies, funds and strategic investors, and R&D will finally work in Russian biotech.



DMITRY POPOV,
MANAGING PARTNER OF MAXWELL ASSET MANAGEMENT

EFFICIENT STATE SCIENCE EXPENDITURES

Changing state financing of science to a competitive model.

The first stage of the Strategy (2011-2013) involved development of competitive financing as one of the chief means to more effective state investment in innovations. A program for fundamental research in Russia, involving a wider range of possible participants, is planned.

All grants are to be open to any qualified researchers and workgroups, public or private, and independent workers. Qualification must be proved with a portfolio of successful projects and international-level publications. This will become an important criteria for competitive funding in fundamental science.

On 27 December 2012, the Government approved with its decree 2538-p a Fundamental Research Program 2013-2020, which provides for competitive allocation of funds in fundamental research and better financial instruments to support science country-wide.

Research grant accountability.

Quality of assessment of a scientific project, at every lifecycle stage, is important for quality research. The review system in place faces just criticism from the scientific community and does not contribute to the development goals in the Strategy. An excess of inspecting bodies with their peculiar ways of finding and assigning experts and reviewing practices make systematic control of assessments' quality impossible.

Assessment quality will become more important with the deployment of a network of R&D funds specified in the Financial Instruments and Scientific Support List, approved by the Deputy Chairman of the Government, O.Y. Golodets, on 16 March 2013 (document 1335п-П8).

To improve quality, specialized expert organizations will be set up to provide assessments on order. They will be controlled by expert groups in particular fields of knowledge, united in a Science Council

that is being formed under the Ministry of Education and Science. The Council, responding to the expert groups, will correct legislation for procedures and order of assessments.

To improve accountability in R&D, new reporting forms have been developed in 2012 for the ongoing federal special programs — Priority Research and Development 2007-2013 and Researchers and Science Faculty 2009-2013. Reporting was simplified, excess forms discarded. An even more significant reduction is planned for the new federal special programs — Priority Research and Development 2014-2020 and Researchers and Science Faculty 2014-2020.

STATE PRIORITIES IN SCIENCE AND TECHNOLOGIES

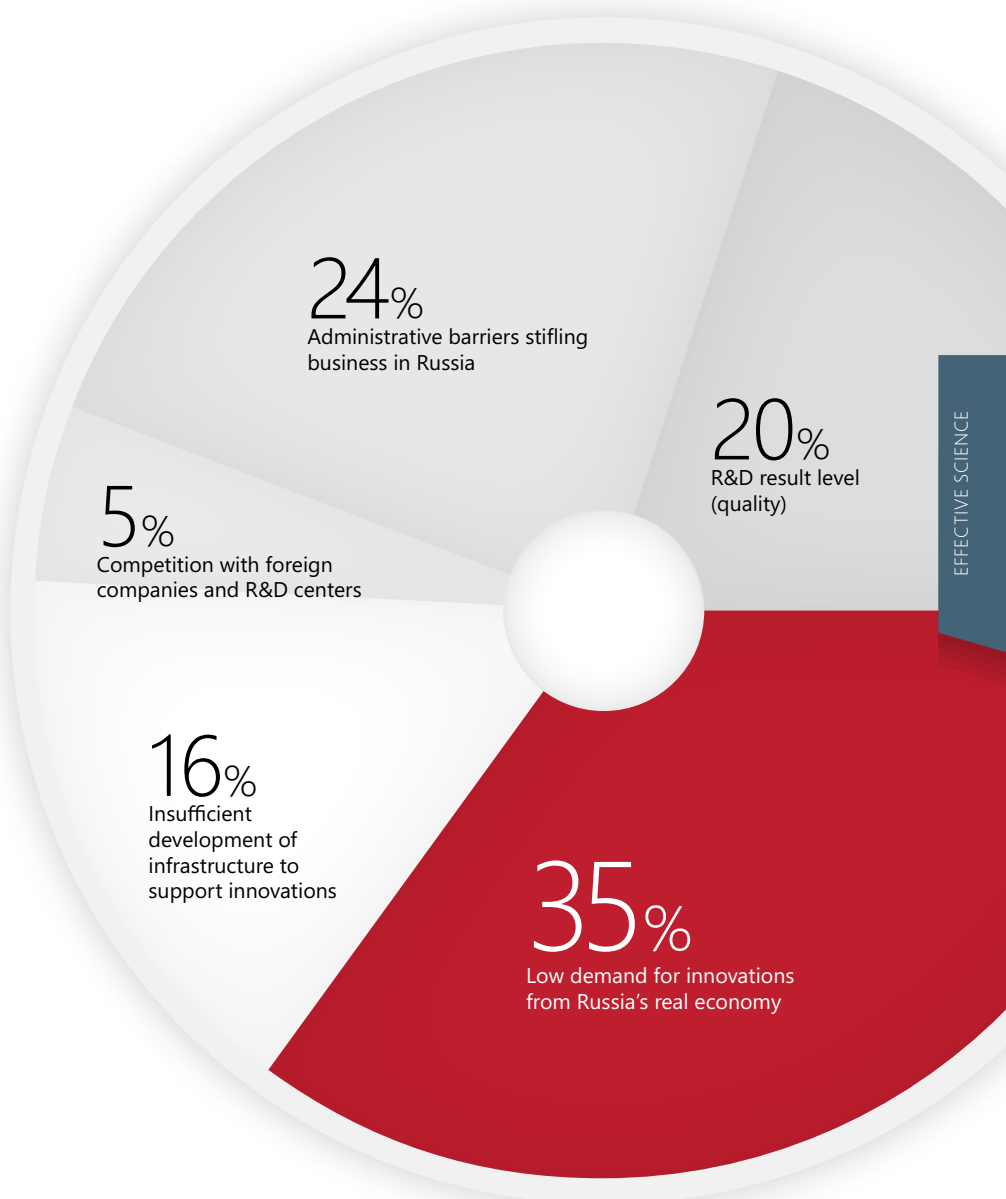
State program Scientific and Technological Development.

The Government with its 20 December 2012 order 2433-p has enacted a state program, Scientific and Technological Development 2013-2020. It includes funding for the R&D sector and a number of initiatives, with total expenditure 1.6 trillion roubles. From that amount 145.1 billion are allocated for 2013, 156.8 billion for 2014, 170.1 billion for 2015. The program has three stages: the first spans 2013, the second lasts from 2014 to 2017, the third from 2018 to 2020.

It specifies in greater detail the state priorities in science and technologies. The program's point of departure is impossibility of improving Russian science's efficiency and competitive strength with funding alone. It must be combined with rational restructuring and development of the R&D sector. Under the program, institutions will be reformed, management and financing for the sector optimized, its personnel conditioned and technological base upgraded.

The program analyzes the current situation and describes the tactics for reaching the goals in the Strategy for Innovative Development of the Russian Federation for the period until the year 2020. The Government believes that the R&D sector is now moving from a conservative, retain-potential state

Factors preventing successful commercialization of R&D in Russia



The conducted survey showed that R&D commercialization efficiency in Russia, according to the respondents, is equally influenced by all factors offered for evaluation.

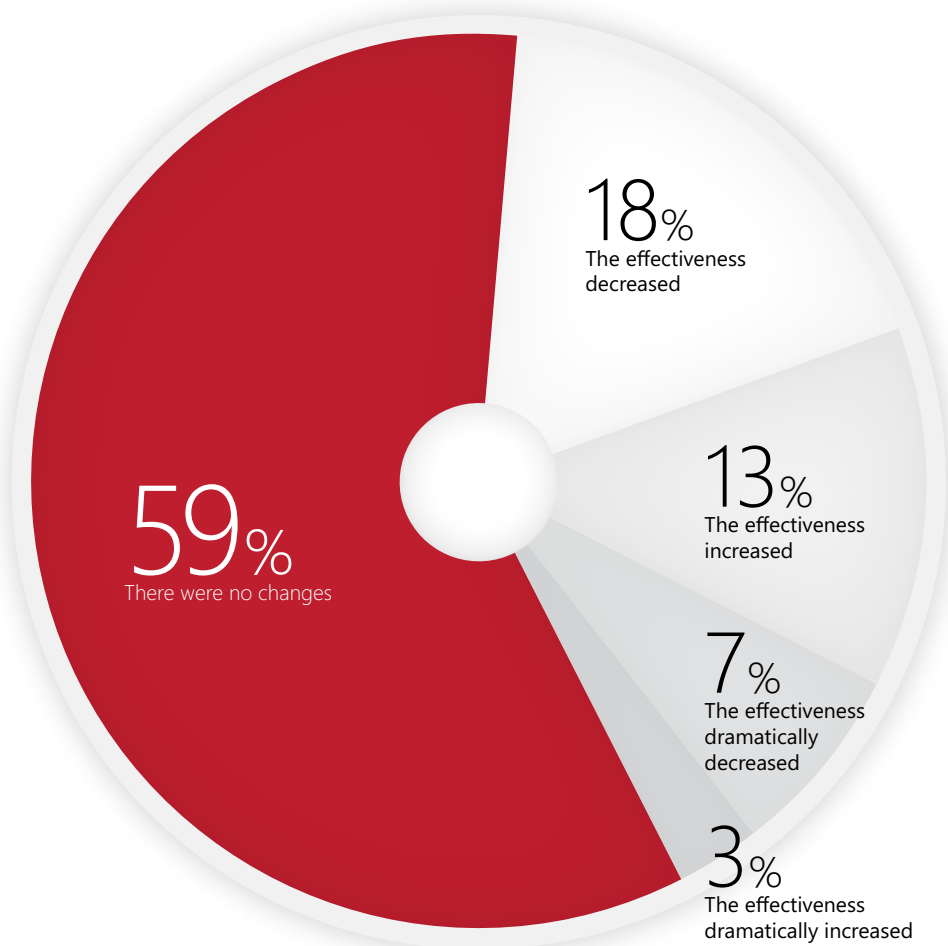
Not surprisingly, 35% of respondents noted low demand for innovations from Russia's real economy.

It is obvious that further interface development between science and enterprises through R&D commercialization remains a very up-to-date task for the state and R&D institutes.

Close attention should be paid to the level of innovation and application of R&D results as well as to administrative barriers stifling transparent and mutually beneficial cooperation between academic institutions and subjects of market economy.

Source: Survey of innovation market players, RVC, 11-24 April 2013

How did effectiveness of government science spending change within the past two years in Russia?



The major number of respondents (59%) didn't note any changes in effectiveness of government science spending. However, it is obvious that the system of scientific knowledge generation has a visible momentum. That is why the results achieved during the survey may not fully reflect the factual dynamics, including positive dynamics.

Source: Survey of innovation market players, RVC, 11-24 April 2013

In 2001-2009 the capital equipment expenses in the internal R&D expenditure constituted 2-3%. During the Strategy implementation it is planned to increase the labor infrastructure

by 2–2,5 times

to active involvement in economic growth. "The planned 3% of the GDP for innovation by 2020 are meant to help retain the potential of domestic fundamental science", the program reads. "This potential requires decades-long maturation of schools and traditions. Its quick expansion is not realistic, but its loss unacceptable and not to be compensated even with several years of quick growth. The fundamental sector must be gradually developed, most of all with such measures as clear setting of priorities and pooling of resources for them while improving management and financing, better motivation to science with improved salaries and conditions, added competition with attracted talents".

Creation of first science settings.

One way to global leadership in certain innovation fields is to create "mega-science" settings — unique and usually expensive world-class research hubs. They not only allow unique research, but raise significantly the overall level of domestic science, attracting illustrious explorers from around the world, improving the country's image and helping science schools.

Projects for "mega-science" objects were part of the Strategy's first stage. In 2011 an inter-departmental workgroup was created. It selected 6 such projects and, collaborating with various scientific institutes, created plans for implementation, roadmaps, case-by-case explanations of possible involvement of other nations and their expected financial contributions.

In autumn of 2011 the Ministry of Education and Science and project claimants formed an international expert group. It included 18 prominent foreign analysts and specialists in creation of large scientific infrastructures. The group analyzed the projects. The experts confirmed their scientific importance, noted they would facilitate breakthrough research in fundamental and applied science. They also pointed to incomplete technological concepts of the centers, issues in financial justifications, e.g. engineering and social infrastructures, and legal and organizational aspects of "mega-science".

As of 2013, three mega-projects have sponsors

with signed agreements:

- the Complex PIK project will receive equipment from the Helmholtz-Zentrum Geesthacht Centre for Materials and Coastal Research (Germany);
- the Tokamak Ignitor project became part of the three-year research plan of the Italy's Ministry of University and Scientific and Technological Research;
- the Complex NICA project was entered into the seven-year development plan 2010-2016 of the Joint Institute for Nuclear Research, approved by

the Committee of Member States.

These three projects' superior completeness and readiness, opinion of international experts and real contributions from foreign partners have led to a decision to make them the focus of first-stage efforts.

The other three mega-projects will have to wait until their claimants locate more foreign participants.

Experts' recommendations

Expert interviews with Russian innovation market players have identified a number of suggestions and recommendations for faster implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 under the Effective Science priority. The scientific community and development institutions should focus on the following:

1. Create, using input from government, business and development institutions, accurate roadmaps following the global technical development trends.
2. Assist scientific institutes in changing to the new competitive roadmap and trend-based knowledge model.
3. Find, popularize and use the best science-business collaboration practices.
4. Decrease the share of "administrator scientists" in the academic community, support researchers with real projects.
5. Gradually bolster of domestic demand for R&D.
6. Joint efforts from the government, development institutions, the scientific community and business open the market to those innovations from the defense sector that show the most commercializing potential (with military importance of unique technologies and legal aspects considered).
7. Search and articulation of demand from the real economy for breakthrough research and technologies in several key areas, including IT, telecommunications, biotech, robotics.
8. Rejuvenate the scientific community with young scientists motivated to do fundamental and applied science studies in this country.
9. Achieve better transparency for projects to commercialize state-owned intellectual properties. Create effective spin-off possibilities for innovating colleges and scientific bodies.
10. Encourage the growth of engineering companies as main consumers of research and "integrators" of unrelated innovations in high-technology products. These companies must become intermediaries between science and industry, "packaging" the former for wide application in the latter.
11. Continue to develop technology transfer centers at scientific institutes and colleges, connecting them in a network with a common base of promising research, e.g. in the manner of Europe's Enterprise Europe Network.
12. Create a system of risk dampening for investors and innovations companies in segments where long to-market times combine with high costs, e.g. biotech. This could be one way to reduce the Russian innovation market's, and the venture investment market's, bias towards IT and the Internet.
13. Promote further the open innovation models as an economy driver.
14. Help develop the market of "packaging" companies commercializing R&D.

Innovative State of the 21st Century

“Make it so that people are afraid of laws and laws alone”.

Catherine the Great



Strategy

The system of public administration and provision of public services should be modernized in accordance with the requirements of innovative development.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020

Russia is about to complete the initial stage of the formation of a national innovation system: all the basic elements have already been created; now how they interact and coordination themselves is being adjusted, with a harmonization of participants' interests, and the self-reproduction and self-maintenance of the system as a whole is being launched. It is logical for the state and its institutions to play a central role at this phase, stimulating the right pace of development and using all resources available to reinforce weak links. Thus, the state's share in financing R&D in Russia is 67% (source: the Federal Service of State Statistics (Rosstat), 2011). Meanwhile, the state — and this thought runs like a golden thread through the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 — should not be a substitute for market mechanisms and should gradually reduce its intervention to a minimum at later stages, ceding to initiatives given by market participants. In the future,

the role of the state in the national innovation system should be reduced to “fine tuning” and — if necessary — to focusing resources and efforts on lines of scientific and technological development, which the state itself considers a priority for the country's future.

The Strategy puts special emphasis on the fact that the state not only acts as a **subject** for policy modernization policy and innovative development — it is itself **subject** to this policy; i.e. it is the state machine that should experience a qualitative change in the course of economic transition from a raw model to one driven by innovation. In other words, an innovation-driven economy cannot survive without an innovative state. That said, it is important that, in addition to administrative functions, the state should play a number of important roles in the economy. First, it provides public services for both individuals and legal entities, with a wide range of socio-economic parameters which depend on the quality and speed of delivery — from individuals' moods to business climates. Therefore, the introduction of organizational, administrative and technological innovations is long overdue within the sector. Second, the state is the largest “consumer” of goods and services, given the formidable size of the public sector of the Russian economy. This in turn means that the process of government procurement, at least in part driven by the introduction of innovative products, services and works, is to create significant demand for high-tech businesses. All these aspects have been reflected in the Strategy and integrated into the plan for its implementation in the initial phase (2011-2013).

INTRODUCING INNOVATIONS INTO THE SYSTEM OF PUBLIC ADMINISTRATION

Organizational changes and aligning government programs with the Strategy.

The initial implementation of the Strategy has required organizational and structural changes in government agencies. Most federal executive bodies have established units in charge of innovative development within their areas of competence. The Russian Government adopted Decree No. 1172 (November 16, 2012), which officially granted federal executive bodies powers to provide state support for innovation activities. These include:

- providing information and advice support, helping to prepare project documentation;
- shaping demand for innovative products;
- financial support;
- implementing targeted programs, subprograms, and organizing events as part of Russian federal programs;
- export promotion;
- provision of infrastructure.

In accordance with the Decree, the powers listed have been granted to 41 federal executive bodies.

The Strategy for Innovations is complex and in some way affects most departments and sectors of the Russian economy and R&D institutions. That is why adopting the Strategy on December 8, 2011, has required further adjustments to state programs which were already underway, and taking associated steps to focus on innovative development. The new government programs must take into account the goals identified in the Strategy.

Among the government programs deemed critical for achieving strategic goals are the follow-

EXPERT OPINION

“Russian business still does not generate much of a demand for R&D. But on the whole the domestic and foreign nanotechnology markets are growing day by day. In 2012 the domestic market was 11% over 2011, amounting to about 230 billion roubles. Not a bad result, but there is potential for much more.



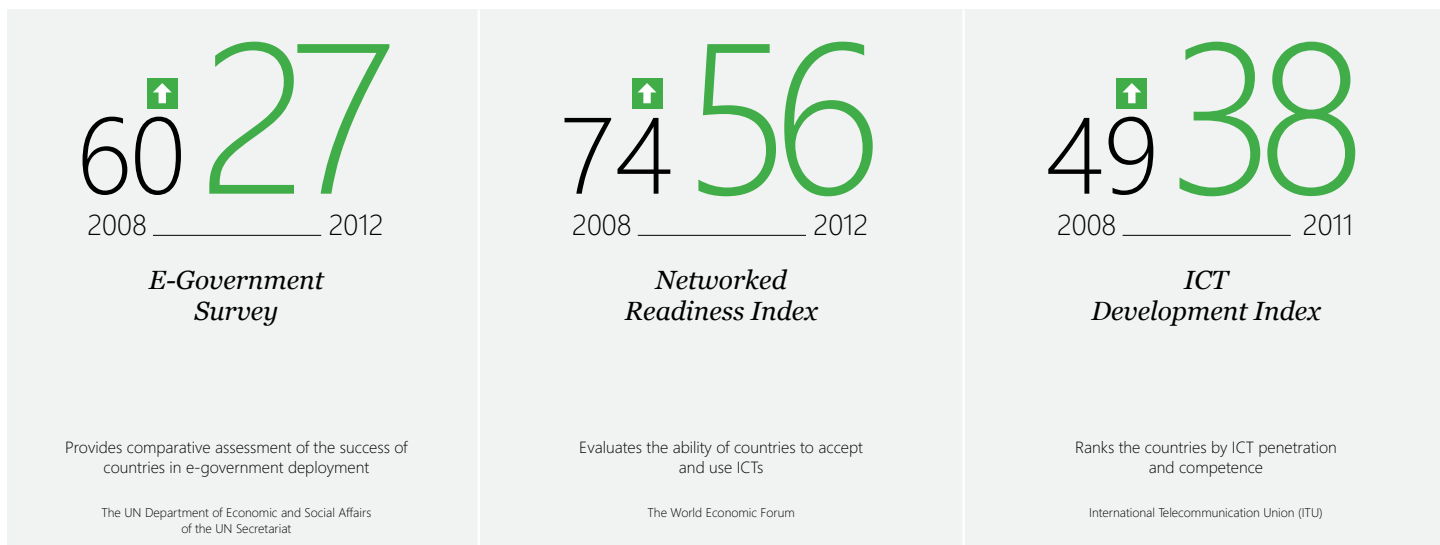
What should be done? Number one: there should be less state presence in the economy. State corporations and companies with state participation make up a very large portion of the GDP. And a market run by state business is always less competitive. Number two: we need to improve the system of technical standards and regulations. These two measures could whip up demand for nanotechnologies in Russia. Among the positive signs in the last few years I would point to the large companies' and even budget organizations' turn to nano products. These products are nothing if not innovative, and demand for them says much about an increasing interest for R&D as a whole. We collaborate with the largest state corporations from various industries: Russian Railways, Gazprom, Transneft, Avtodor, Russian Post, AvtoVaz, Federal State Reserve and Federal Space Agencies, companies in the defense sector. Last year's growth on the nanotechnology market had to do with this involvement of Russian consumers.

As for what to suggest, the government definitely needs to make the system of technical standards friendlier. And work to convince state corporations that they can make use of innovations, that risks are taken care of. We also need innovation efficiency controls for procurement organizations, for management of state corporations and companies with state participation.

The government should protect innovators, because global competition is very high. Now that Russia is a World Trade Organization member, it is time to start introducing innovations, nanotech included, to prop up the economy's traditional mainstays. WTO members widely use high-tech monitoring of products to protect home industries. Plainly put, you can put pork on the market only if the meat has a government-approved electronic passport with its entire "biography". For example, as a sanitation safeguard, every one of a slaughtered animal's diseases and drugs used to cure it must be recorded there. Introducing such requirements would stimulate Russian agriculture to explore high-tech solutions, including nanotech, and protect our breeders from competition with foreign exports. Every industry traditionally strong in Russia could benefit from similar innovations protecting home market.

ALEXANDER MOROZOV,
DIRECTOR OF THE PROGRAM PROMOTION DEPARTMENT OF RUSNANO'S FUND
FOR INFRASTRUCTURE & EDUCATIONAL PROGRAMS

Russia in ICT development ratings



EXPERT OPINION

“One important task is to complete the system of corporate venture funds, including public-private ones. They are a very effective instrument for developing an innovations economy. Especially since corporate venture funds have already appeared on many R&D agendas state corporations had worked out for the Ministry of Economic Development. Unfortunately, we still don't have very many of these funds. But the fact of corporations investing in R&D (establishing funds, developing projects to participate more in the market) would itself mean a great deal. Corporations would be spending not only on home-grown R&D from their departments but also on R&D from the open market. It would help ventures. Start-up founders would be more interested in developing effective companies. Large corporations would then have managers who wish not to “put” money on R&D, but recoup income from good innovations. If the government stepped in corporate venture funds, it would show to everyone they have support of our policy-makers.



On the whole, the government should really develop innovations as a commercial activity. If state subsidies in an industry become hand-outs, commerce suffers. The result is always a report on research done instead of a technology or a working product. It is not all that important what kind of money is revolving in an innovations economy — public or private. What is important is conditions for giving that money and indicators to measure efficiency. For a start-up it means that, soliciting funding, they need to know exactly on what they may and must spend it.

KONSTANTIN NADENENKO,
CEO FOR VENTURE INVESTMENTS OF ASSET MANAGEMENT COMPANY LEADER

ing: “Economic Development and Innovation-Driven Economy”, “Scientific and Technological Development”, “Education”, “Knowledge Society (2011 to 2020)”, as well as other government programs aimed at developing high-tech sectors (aviation, space exploration, nuclear power generation). Work on aligning the Strategy with Russia’s federal programs, including in the context of agreeing timetables for implementation, will be continued as part of the activities by the Interministerial Commission for Strategy Implementation under the Presidium of the Presidential Council of the Russian Federation for the Economic Modernization and Innovative Development of Russia.

E-Government

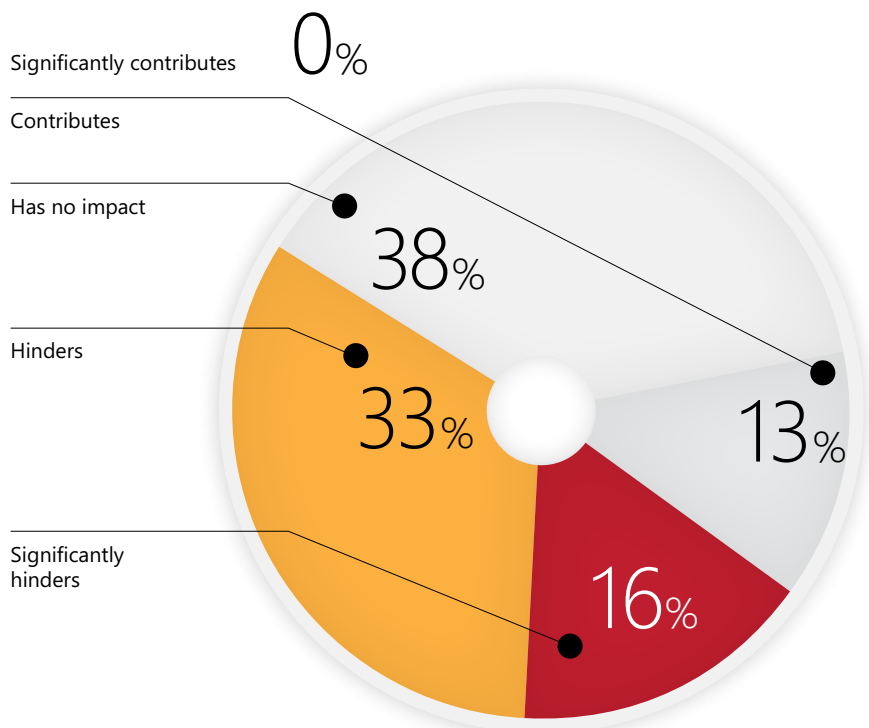
The widespread use of information and communication technologies (ICT) is one of the characteristic features of innovation-oriented states. An important step in this direction has been taken by Russia through implementing “E-Russia (2002 to 2010)”, a federal target program (with the Russian Ministry of Communications in charge). The aforementioned period saw a number of public information systems established, including a unified portal for central and local government services, the “Upravleniye” (“Governance”) state automated system, a portal for central and local government procurement, and a standard information system to support multi-functional centers for central and local government services for Russia’s constituent entities. In the meantime, networks of certification centers and public access to government services became available, along with hardware and software R&D models to analyze and predict the performance of works under national priority projects, to monitor and assess the effectiveness of budgetary resources management, information retrieval systems for multimedia data storage and processing.

Nevertheless, in the late 2000s, it became obvious that the knowledge society development rate in Russia was progressing more slowly than in other countries, corroborated by positions awarded to Russia in a number of global ratings evaluating IT distribution and penetration. The “Knowledge Society (2011 to 2020)” federal program was developed to create an integrated, effective IT system, allowing citizens to benefit to the greatest possible extent. The program includes four subprograms: “Information and Telecommunications Infrastructure of Knowledge Society and Related Services”, “Information Environment”, “Safe Knowledge Society”, and “Information-Driven State”. The last subprogram’s budget is set at RUB 1.94 billion.

Among the priorities of this federal program is the provision of electronic interactions between federal agencies and central and local government bodies, as well as electronic central and local government services to citizens.

In December 2012, the Russian Ministry of Communications announced that it had successfully migrated to electronic interactions (e-interactions) in the constituent entities of the Russian Federation, with full-

To what extent does the current Russia public procurement system contribute to or hinder innovative development?



An overwhelming majority of those surveyed (49%) note the negative effects of the current Russian public procurement system. This fact shows that issues facing the innovation market are indeed topical and that the public procurement system is in need of reformation.

Source: Survey of innovation market players, RVC, 11-24 April 2013

scale operations to begin in January 2013. The government e-interaction system was created in accordance with Federal Law No. 210 (July 27, 2010) "On the Organization of the Provision of Central and Local Government Services". It incorporates a network of protected communication channels linking hubs located in Rostelecom data centers. The use of the system by executive bodies is highly convenient for public service users: citizens no longer need to spend time collecting documents from various state agencies. Just a personal document (passport, etc.) needs to be presented; other details can be obtained by agencies through an electronic document management system (EDMS), moreover — they are not even entitled to demand information that is already available to other public authorities from individuals and legal entities.

INNOVATIONS IN PUBLIC, INFRASTRUCTURE AND SOCIAL SECTORS

Roadmaps for priority technological development areas.

The initial implementation phase of the Strategy is of particular importance as a time of establishing interactions between the executive bodies and other interested organizations. One of the most effective tools in helping coordinate efforts to create innovative development models for a variety of industries are so-called technological roadmaps. Roadmaps are a visual representation of technological development phases within the industry or groups of related technologies and the effect (good or bad) which it can cause to other sectors of the economy, as well as giving possible alternative scenarios. Roadmaps allow an inventory to be made of the potential of the study object, as well as identifying bottlenecks, threats and opportunities for growth. Importantly, the process of roadmap drafting and further negotiating is usually interdisciplinary in character (employing various multidiscipline experts), which allows for a multidimensional integrated analysis.

Designing roadmaps for priority technological development areas has been initiated in accordance with an order from the President of the Russian Federation dated December 22, 2012 No. PR-3410. Among the lines of work being developed are composite materials, biotechnology, genetic engineering, IT, urban development, photonics, engineering and industrial design.

The Russian Ministry of Education provides state support for the development of essential production technology, innovation, as well as for technology commercialization projects based on public-private partnerships within the framework of the "Research and Development of Priority Lines of the RF Science and Technology Sector, 2007 to 2013" Federal Target Program (FTP).

Integrated projects involving research and technology within the framework of the FTP should en-

EXPERT OPINION

“Thinking on effects of state support for the Russian software market, social insurance relief for companies is the first thing that comes to mind. Because of it, the industry showed annual growth of more than 20% in 2011-2012. Extending the incentives is critical for the software industry's future. Another important factor was the government's attempts at dialogue with the IT industry — first as the Council of Experts with the Ministry of Communications and then as the Council of IT Industry Associations with the Ministries of Communications and Industry and Trade. The Ministry of Economic Development is working in the same vein. It helps regional R&D clusters and business associations interact with state corporations' iR&Dclub.

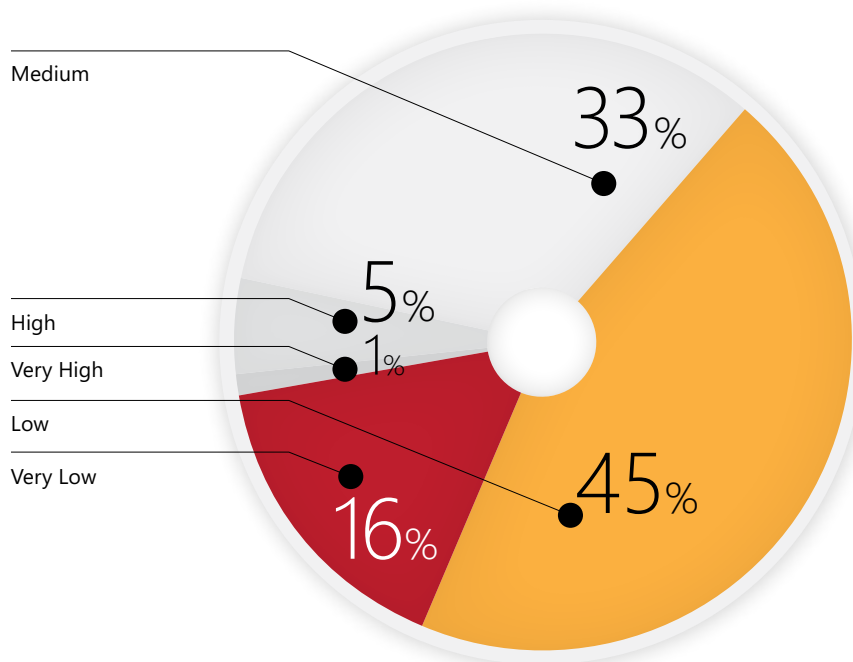


RVC's efforts to create various instruments are, on the whole, commendable. We in the non-profit partnership RUSOFT believe that software development in Russia could benefit from the following:

- Encouraging public-private partnerships and business investment in advanced training and re-education of technical specialists, e.g. in IT.
- Comprehensively assisting, e.g. financially, Russian technology companies' marketing efforts in foreign markets.
- Removal of administrative barriers in currency and exports control and easing prototype exports.
- Perfecting the system of R&D financing with involvement of business associations in application reviews and selection of winners.

VALENTIN MAKAROV,
PRESIDENT OF NON-PROFIT PARTNERSHIP RUSOFT

What is the actual efficiency of the tax incentive and benefit system that could be used by Russian innovative companies?



61% of respondents evaluated the efficiency of the Russian tax incentive and benefit system as "low" and "very low", which leads to a certain conclusion concerning the reasonability of further liberalization of tax treatment for players in the innovative sector of the Russian economy.

Source: Survey of innovation market players, RVC, 11-24 April 2013

Experts' opinions

“The innovations community has great expectations for the state program “Economic Development and Innovations-Based Economy 2020”, recently approved by the Government. It creates an R&D procurement register for state organizations and sets development tasks for regional administrations. The minimum share of innovative products in total volume of orders is set at 6% for 2013 and will increase to 15% by 2020. This is a very efficient way of stimulating demand for R&D.



For example, the Government of Moscow bought around 700 billion roubles' worth of products in 2012. Its decree 67-ПП sets a procurement quota for R&D in that mass at 5%. Not bad for starters. One important question remains — how to determine which products are innovative? What minimum technical requirements must they meet? The lists of innovative products in use today, including Moscow's lists, need improvement. The government should delegate this task to expert agencies, and they should develop and update a classification of R&D projects by segment and technology type. It needs to have detailed descriptions, with technical characteristics, an estimation of economic rationality and so on. This is particularly important now that the Contractual System law is coming in force.

DANILA SHAPOSHNIKOV,
FOUNDER OF AT ENERGY LLC

“The Russian market already has enough money for seed stage innovations projects. But that money is not particularly “smart”. Financing R&D seeds is more appropriate for private investors with business experience, because the chosen start-ups rise or fall is going to depend very much on the investor's resources and expertise. The government with its development institutions and other instruments should give seed funds, most of all, legal support. For example, simplify transactions. Instructing entrepreneurs in legal matters is also important. Co-investment, that is, leveraging key investors with state funding, works well. Tax incentives are not particularly important in this field, in my opinion. What our legislation needs the most is an easier procedure for striking a deal.



IGOR BOROVNIKOV,
CHAIRMAN OF THE BOARD OF DIRECTORS OF SOFTLINE

“Protection of intellectual property in Russia is in its infancy. Most of all because of the government's lack of appreciation of non-physical assets and the need to protect them, and absence of governing legislation. This began to change only recently — part four of the Civil Code, where copyright is discussed, came in force on 1 January 2008. But practically the only thing a high-tech start-up has is its fundamental know-how. If that know-how gets in the hands of someone with bigger technical and financial assets, the start-up might as well be dead.



Also preventing effective copyright are excessive requirements for security measures, some of which look like something out of the 20th or even 19th century. For example, for a know-how to be classified as a trade secret, the rightholder must put a “Trade Secret” label on all the data, with his full name and location. This requirement, more or less satisfiable for documents on paper, becomes completely meaningless and impossible to follow with modern information systems. There have been cases when Russian courts refused to protect and redress developers' rights because this label was missing.

Many precedents show that our practicing legal experts — judges, companies' attorneys — have a very weak grasp of copyright. They make diametrically opposed decisions in very similar cases, flat-out refuse to redress loss of benefit, even though with copyright the main losses come exactly from being unable to exploit an exclusive right on a technology.

Real copyright protection requires Russian legislation to follow other countries' codes, which take into account modern realities. A better understanding of legal aspects is also needed, especially for businessmen, as is a consistent scheme of decision-making, to improve trust in the courts.

MIKHAIL YEMELYANNIKOV,
MANAGING PARTNER OF CONSULTING AGENCY YEMELYANNIKOV,
POPOVA & PARTNERS

“The regions are beginning to respond to the government's attempt to set up an innovations infrastructure. A new economy is being built from the top down, so the effects are visible where the regional authorities are active.



One of the main problems is apathetic colleges. Active, dynamic college projects often clash with the schools' hierarchy and fawning over rank and get squeezed off premises. Young people often quit graduate school when they see they are studying something useless. Colleges need federal-level reforms. Students are almost never allowed access to laboratory equipment. Collective use centers are one rare exception. Every department considers the equipment it has is its property and usually even faculty from other departments can't get to it. So costly devices become obsolete without seeing effective use. Federal law 217, helpful though it was, made colleges want to open as many businesses as they can. Invent an excuse, found a company, get a grant, file a report.

Demand for innovations is a topic by itself. Instead of trying to introduce new technologies to practice, cut costs and get competitive advantages, all people care about is getting the largest procurement contracts. In this situation the government often has to “enforce” innovations. But often it's just for show.

Customs is a serious issue. It's next to impossible to create a competitive product. Not only is it forbidden to import many brand-new components, but our own customs service gets in the way, and there are all sorts of problems with shipments to Russia. Supplies take such a long time and such a lot of money to get, competition is basically impossible.

SERGEY SOROKIN,
FOUNDER OF INDUSTRIAL GEODETIC SYSTEMS

sure the effective use of research outcomes in the development of advanced technologies with significant potential for commercial use.

In addition, the FTP provides for the implementation of major innovative projects nationwide, which are sets of interrelated measures linked in terms of the resources, participants and timeframes involved, aimed at achieving the necessary level of national security and economic benefit.

International Industrial Cooperation and Localization of Foreign Industries and Technologies.

The level of attraction for investments in Russia, as a convenient production site, directly affects the inflow of foreign knowhow and technology. Joint ventures (JV) with global technology leaders have a multi-factor effect on the Russian economy, including the localization of production, use of local raw material and component suppliers, technology transfer and the development of human resources and of technological competence of Russian staff. In order to localize promising production technologies and to create an environment for attracting foreign investments, the Russian Ministry of Industry and Trade has been working to promote the creation of joint ventures in a number of sectors.

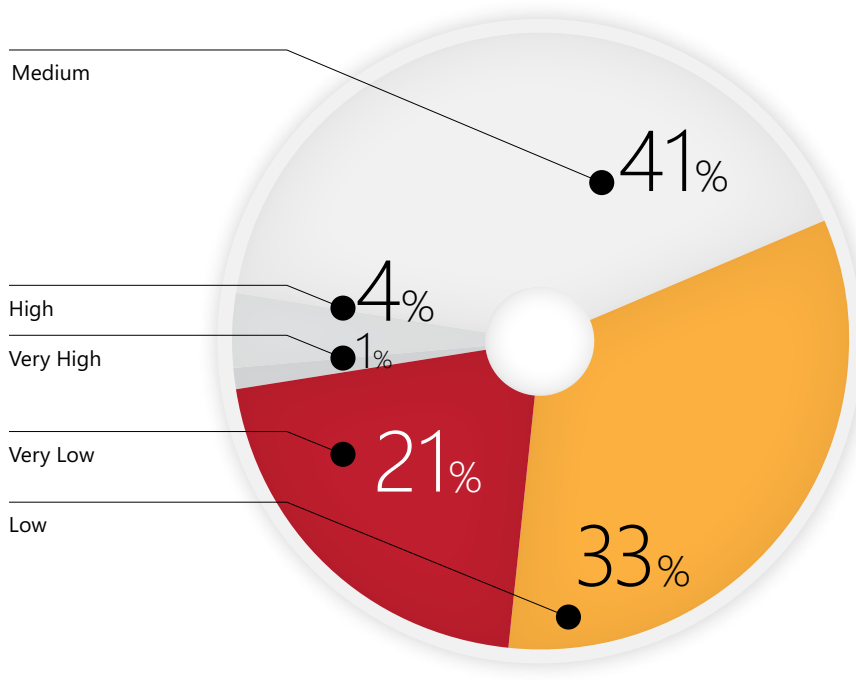
The automotive industry is one of the priority sectors. In 2005, the industry adopted the Procedure, which outlined the concept of "industrial assembly". The idea of the "industrial assembly" of components and assemblies has been introduced on the basis of predicted growth in the car market, the number of assembly plants and the demand for high-quality automotive components. Implementing investment projects as part of this way of working implies according custom privileges to vehicle components manufacturers whilst fulfilling obligations to create up-to-date vehicle component production facilities and achieving a high level of localization and added value in Russia.

The introduction of this strategy has attracted an influx of foreign investment into the Russian automotive industry, provided modern production facilities, advanced technologies and engineering expertise in Russia. Leading global vehicle manufacturers, which produce more than 90% of the world's motor vehicles, have set up production in Russian regions. As such, as part of this strategy, the Russian Ministry of Economic Development and Trade has signed agreements with 31 leading global vehicle manufacturers (Volkswagen, General Motors, Toyota, Ford, Nissan, Renault, Citroen, Kia, Hyundai, Peugeot, Mitsubishi, Mazda, Škoda and others). The industrial assembly strategy has allowed for the total domestic production of new passenger cars to increase from 900,000 per annum in 2005 to 1.7 million in 2012. The Russian Ministry of Economic Development and Trade has signed agreements with 70 vehicle component and assembly manufacturers in accordance with the Procedure. Among them

are large companies such as LEAR, Magna, Johnson Controls International, Visteon, Faurecia, etc. Total investment in the projects is planned to reach around USD1.2bn. Within the framework of existing projects, production facilities capable of producing an annual total amount of up to 35 million units of automotive components and assemblies have been established. The planned number of jobs will be over 18,000.

Similar processes are underway in other industries. The production of Desiro RUS electric trains is one of Russia's largest projects for transferring technologies. On September 7, 2011, Russian Railways and Siemens Trains Technologies (a joint venture between German company Siemens AG and the Russia-based Sinara Group) signed a contract for the supply of 1.2 million electric train carriages for commuter services. Trains will be manufactured at Ural Locomotives production facilities. In accordance with the terms of the contract, by the end of 2017

How do you evaluate the effectiveness of intellectual property protection in Russia?



Only 5% of respondents evaluated the effectiveness of intellectual property protection in Russia as "high" and "very high". 41% rated it as "medium".

In view of this fact, the government and development institutions should focus on the further development of the intellectual property protection infrastructure. Solution to this problem may involve not only legislative activities and support for Russian companies entering the market with innovative projects but also a sophisticated infrastructure of service entities capable of providing intellectual property owners with services required for commercializing innovations.

Source: Survey of innovation market players, RVC, 11-24 April 2013

Experts' opinions

“One of the most important changes must be to revise legislation and adopt it for small innovations companies. Then, for example, Russian firms in the Farma-2020 strategy and with agreements with the Ministry of Industry and Trade could develop effectively, get contracts for new drugs, cooperate with science centers. State support of innovations works, but not without problems. Our legislation requires innovators to put up security for state contracts. For a small business to take 1.5 million dollars out of circulation and keeping it “on ice” is too difficult. The ecosystem should be geared towards supporting small innovators, not large companies that can easily advance 2-3 million for security. In theory a small developer could have backing from a bank. But the legislation demands banks to have floating assets for every security they provide. This is important to show that the innovations ecosystem is part of the ecosystem of commerce in general.



R&D is very sensitive to regulations. One example is the United States, where FDA's requirements on new products — drugs, medical equipment — has spiked in the last few years. Pharmaceutical companies are finding developing new products in the US too much trouble, so American biotech and medical start their projects in Europe and Asia and then make a “come-back”. This is a serious problem for the US — innovations have started to drain out of the country. For Russia it's an opportunity to learn from others' mistakes and avoid them. Excess administration can start pushing innovations out of a country. It's also important to make financing more accessible, especially in capital-intensive industries — pharmaceutical, bio-pharmaceutical, space R&D. State programs and grants are not enough. We need powerful private capital. And it must be professional. We need to continue building up the venture investments industry in the country. The development institutions as bringers of funding to R&D played their part very well, and continue to play it. But it is time to start gradually moving the innovations economy towards private business.

There is no other way to stimulate the economy's development towards an innovation-based model by open-market means. The government needs to continue sponsoring R&D, stepping out little by little and creating a legal environment comfortable for market players. And then learn to let things happen.

YEVGENY ZAITSEV,
MANAGING PARTNER & CO-FOUNDER,
HELIX VENTURES VENTURE FUND

“A venture investor makes his living by acquiring a share in an R&D company and later selling it. Accordingly, the sector's environment is as comfortable as there are quality projects entering and exit rules are clear.

For entering projects I can say that in the last few years not only many more have appeared, but quantity is gradually becoming quality. There are more and more chances to find a project with high potential pay-off.

If we compare the Russian venture market to well-developed ones, for example, American or Israeli, it becomes obvious that the main problem here is slow development of portfolio firms. They “mature” longer than in the West. Late-stage investors have to wait a considerable time before their target company is ready for the next trench. American and Israeli companies walk the road from seed investments to prototype four times faster than Russian.

I think the government with its development institutions and organizations half way between development institutions and funds (venture funds with VTB, Vnesheconombank and Sberbank) could do a great deal to improve the situation. The money now being spent on direct financing could be directed at infrastructure.

The development institutions should spend more than 50% of their time and resources building an ecosystem, and only what's left on financing.

For problems, I can say that an “exits market” for venture investors still does not exist, and the three classic “exits” — IPO, sale to a strategic investor and Managerial Buy Out — have limitations.

For example, our corporations don't have a culture of growing on acquired projects. They'd sooner develop from scratch. And that's a complicated issue. We need to start asking these companies' owners why they don't buy Russian techs from investors. In theory the government could help, but it's not so simple. The biggest players in most industries are private companies the government does not have direct influence on.

As for MBO, an innovator's managers would have a hard time getting sponsored for that kind of deal by any Russian bank. Most high-technology companies have very few assets, and those are by and large “invisible”, like a great team or copyrights. To solve this problem, the government could stimulate the largest public banks to set up a fund for financing innovators' MBO deals. It could work simply enough: the innovator's management borrows from a bank, buys out the investors' share with that money and repays the loan over the next 15 years. That would be a much more effective format than development institutions and banks' investment funds going into co-financing.

Overall, I think the government should let the “invisible hand of the market” do most of developing for the buyer's market in R&D. Let the market decide. The interplay of supply and demand is an absolute law. And the government can only provide motivation. Like this: do an IPO in the Moscow Exchange' innovations sector — and you can work five years tax-free. Why not stimulate IPO growth for technology companies this way?

ALEXEY SOLOVYOV,
CEO OF PROSTOR CAPITAL FUND



“The Russian government has been devoting a lot of attention to innovations, which is encouraging. There are strong development institutions and large innovations centers, federal and regional, private venture funds and many business angels.

But what is still missing is a broad community of knowledgeable specialists with both scientific competences and experience in commerce. Professional expertise still has not become a main driving force in innovations.

The state should create institutes to provide specialist knowledge of every kind, from developing a federal contracting system to improvement of the forms of organization for science and education. Specialist knowledge for all market participants is a vital element of a more professional and innovation-oriented community in the informational age.

BORIS SLAVIN,
DIRECTOR OF RESEARCH & INNOVATIONS OF IT CO.



the level of localization of electric train production should reach at least 80% of the cost of the train.

The formation of a system of measures to tighten environmental, technical, sanitary and epidemiological requirements, as well as the requirements for the energy and resource consumption of production.

Public policies that trigger innovation and a modernization of processes in the economy include, among others, purely administrative and regulatory measures, such as tightening demands and standards in technical and other areas.

Currently, the Russian Ministry of Natural Resources is involved in drafting legislation related to the following aspects of environmental security:

- improving environmental quality management, primarily from the point of view of mitigating negative impact, as well as reforming the system regulating such impact;
- improving waste management system for production and consumption.

Within the first line of work, experts are working on improving control standardization processes for environmental protection — as part of preparations for the second reading of Draft Law No. 584587-5 regarding “Amendments to Certain Legislative Acts of the Russian Federation in Terms of Improving Standardization in the Field of Environmental Protection and Introducing Economic Incentives for Businesses to Implement the Best Technology”. A system of technological standards, which, if met, will allow no fines to be paid for negative impact on the environment, is being suggested. Technological standards are a measure of best available techniques (BAT) to be contained in BAT reference books (similar to European ones). Introducing BAT should be “encouraged” by an increase (of up to 100 times) in payments for excessive pollution.

The Draft Law also provides for additional incentives to introduce environmental technologies to reduce emissions/discharges by way of offsetting the costs incurred for production modernization when calculating pollution fines.

Within the second line, Draft Law No. 584399-5 regarding “The Amendment of Federal Law on “Production and Consumption Wastes and Other Legislative Acts of the Russian Federation” has been prepared for a second reading. The Draft Law provides for measures to stimulate the introduction of low-waste and non-waste technology and production of easily-recyclable products and packaging (including biodegradable). To this end, the Draft Law provides for the implementation of the principle of extended producer responsibility for recycling products no long of use to the consumer, including visible ecological fee payments compensating for the cost of recycling waste.

The state regulator Rostekhnadzor is involved in establishing measures to tighten technical require-

ments through developed technical regulations, in accordance with Federal Law No. 184 (December 27, 2002) regarding “Technical Regulation”, as well as in the development of federal rules and regulations concerning industrial safety, in accordance with Federal Law No. 116 (July 21, 1997) regarding “Industrial Safety of Hazardous Production Facilities”.

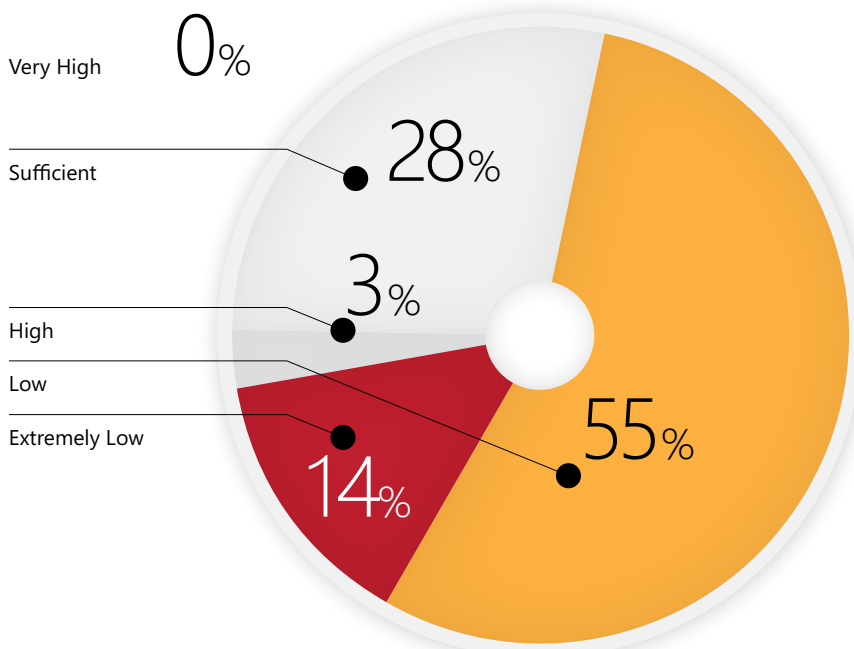
In 2012, Rostekhnadzor developed the following federal rules and regulations concerning industrial safety, including the “Regulation of the Application of Permits in Performing Hazardous Operations at Hazardous Mining and Smelting Facilities”.

GOVERNMENT PROCUREMENT AS A TOOL TO PROMOTE INNOVATIONS

The implementation of pilot projects for forming government procurement plans which include an innovative component.

A transparent government procurement system began to take shape in Russia in the mid-2000s, with the adoption of Federal Law No. 94 (July 21, 2005) regarding “The Placing of Orders for the Supply of Goods, Carrying-out of Work and

How do you evaluate the results of innovating the public administration system in Russia over the past two years?



Most of the experts surveyed (55%) evaluated the results of innovating the public administration system in Russia as “low”, 14% as “extremely low”. Still, almost one-third of respondents evaluate the level of innovation penetration in Russian public administration as “sufficient” or even “high”. This leads to a conclusion that, in general, the measures aimed to raise the innovative level of the government are beginning to work, although they do not fully meet the requirements of the Strategy at present.

Source: Survey of innovation market players, RVC, 11-24 April 2013

Experts' opinions

“When transnational corporations invest in an ecosystem, they focus on effective cooperation with partners and consumers. Intel is busily developing our ecosystem, working with manufacturers, system integrators, software developers, users, informing them about new technologies and explaining how to use them best. For an example of working with end users I can mention Intel's active work with school teachers and college faculty in the 1990s. Cooperation creates long-term demand for new technologies. This helps not only us and our partners, but in some measure our competitors, as well. But without this kind of activity there is no stable and long-term growth.



VADIM SUKHOMLINOV,
HEAD OF STRATEGIC DEVELOPMENT OF INTEL
(RUSSIA & CIS)

“Among the government's initiatives to support the Russian IT market insurance benefits for software developers and procurement of hardware for state organizations had the most noticeable effect.



NIKOLAI KOMLEV,
EXECUTIVE DIRECTOR OF THE ASSOCIATION
OF COMPUTER AND INFORMATION TECHNOLOGY
BUSINESSES (“AP KIT”)

For steps to be taken, I can suggest extending duration of benefits and giving them to a wider range of IT companies, joining ITA, canceling private use copy fees, forbidding non-electronic documentation, promoting IT careers among high-school students, developing a competitive environment by ending support for insourced R&D, working against monopolies and making tenders more transparent. We at the Information & Computer Technologies Industry Association (“AP KIT”) believe that the IT market would benefit if the state offices' top management listened to advice from business associations, if policy objectives for six months, one year and two years were consistently and publicly announced, if reviews of successes and failures were published on a regular basis and the government did not enforce a choice of particular technologies, platforms and other technical details, controlling the industry through performance indicators.

“Domestic real economy's demand for R&D can only grow naturally if its companies exist in a true competitive environment.

Competition for them must be not just a word, but a day-by-day reason to develop, diversify and venture to new markets. For a modest number of small and medium-size companies this mechanism has begun to work in the last few years, but the majority are still competing not for efficiency but for patronage.

Exacerbating the situation is the fact that many of the companies providing the bulk of demand for R&D are state-owned officially or for all practical purposes and tending to monopolize the market. Such companies' procurement and technical upgrade practices need to be seriously revised.

Privatization, gradual replacement of management with a compulsory change of business models, priorities and motivations might noticeably improve demand for innovations in the country. The government in the recent years has started several important projects along these lines. But without a systemic overhaul of the economy, a reconsideration of the measures' focus and a rerouting of state support to uphold results rather than mere activity, these projects can not prevail. As the saying goes, you can lead a horse to water, but you can't make it drink.



ANNA BELOVA,
CHAIR OF THE BOARD OF DIRECTORS OF CARBON CHEMISTRY INNOVATION,
CHAIR OF OAO RVC'S COMMITTEE ON STRATEGY

“I'm head of two innovations companies from the Moscow State University's incubator — Maxygen and Genotek. Starting each one, me and the partners made an agreement that our projects are not going to be connected to the government but will develop as independent businesses. And today we are grateful for the government's help in giving us competitions to participate in and win and grants. But our position is the same: neither project is government-oriented.



On the whole, R&D business is still difficult in Russia. In the last few years many things have changed but not extreme bureaucracy in everything from starting a company to paying taxes.

R&D tax reporting deserves a separate mention, so complicated it is. It's unpleasant to have the company's bank account blocked, fines accumulate and warnings come just because a letter to the tax service got lost in the mail. Which was somebody else's fault. You must agree, the system should not work this way.

I think, such a close oversight of taxes for R&D and complicated reporting are wrong. Starting in 2013 companies using the simplified system of tax reporting must do full bookkeeping. We used to use computer programs for tax calculations, but now we have hired a professional accountant. With the programs, we simply followed the instructions on screen, but now our accountant is doing his best to save us money. Within the law, of course.

As a result, the new system takes away a lot of the government's revenues. Last year we paid to the budget more than we will this year, but we are spending extra money of our own on accounting. And I don't understand just how bookkeeping is going to help against embezzling. Embezzlers are going to find loopholes anyway. But it makes work more difficult for law-abiding companies.

I wish tax reporting for R&D would become notification-based. The government should trust market players. I'm happy to discuss company turnaround and pay my taxes, but I don't want to spend three days out of every month drawing up balances.

Being a biotech company, we are also very concerned about the way customs works. We constantly have to bring in substances, equipment, and we have to work with a customs broker. Customs' procedures are so complicated and obscure, right now we can't even consider doing without.

Registration difficulty is another old sore. Nowadays it seems strange for company registration to take ten days, like three years ago. It would be logical to issue people the documents on the day they bring the application.

VALERY ILYINSKY,
CO-FOUNDER OF BIOMEDICAL COMPANIES GENOTEK AND MAXYGEN

Rendering of Services for Central and Local Government Requirements" (effective from January 1, 2006). The Law concerns procurements of an annual amount exceeding RUB 5 trillion. Six years later, this was supplemented by Federal Law No. 223 (July 18, 2011) regarding "The Procurement of Goods, Works, Services by Individual Legal Entities" (effective from January 1, 2012), which set out the rules for procurement by state-affiliated businesses (public corporations, state-owned companies, natural monopolies, SUEs, MUEs and their subsidiaries), and introduced the principles of information transparency and equal rights observance for those placing orders.

With all the positive impact the existing system of public procurement has had on the economy, it has often been criticized, in particular for not focusing on innovation, since while focusing on the price criteria mainly it has hindered the state from purchasing high-tech goods and services.

Federal Law No. 44-F3 (April 5, 2013) regarding "The Contract System in the Field of Procurement of Goods, Works and Services to Meet Central and Local Government Requirements" to become effective from January 1, 2014 (with the exception of certain provisions for which a different time-

frame has been scheduled) has been called upon to change the situation and replace Federal Law No. 94-F3.

The new law provides for significant changes to procurement procedures. The Russian Federation will have a contract system for the procurement of goods, work and services, established to meet central and local government requirements, which is designed to regulate government procurements from the planning stage to that of evaluating their effectiveness. The fact that innovation should be stimulated in the process of government procurement is incorporated into the fundamental requirements of Federal Law No. 44-F3.

Throughout the initial implementation phase of the Strategy (2011 to 2013), enhancing the innovation component of government procurement has been a matter of concern for the Russian Government. The constituent entities of the Russian Federation, which have expressed readiness for the implementation of pilot projects to enhance the innovation component of the government procurement process, are developing draft regulations to establish a procurement procedure for innovative Russian products which will meet central and local government requirements.

Experts' recommendations

Expert interviews with participants of the Russian innovations market have identified a number of suggestions and recommendations to intensify the implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 in a similar way to "State of Innovations".

1. Further reduction in the direct presence of the state in the economy.
2. Modernizing the government procurement system (including the legislative framework and by-laws), increasing transparency for innovative companies, increasing state demands for innovative technologies, products and services.
3. More aggressive use of the e-procurement system.
4. Modifying the procurement systems of businesses with significant state involvement in order to enhance the demand for technology, products and services of innovative Russian companies.
5. Development of a competitive environment by eliminating support for insourcing (in favor of outsourcing).
6. Provision of incentives to monopoly organizations and businesses, which to a large extent determine the situation in their segment of the market, to encourage the use of an 'open innovation' model in order to enhance the demand for technology, products and services of innovative Russian companies.
7. Further privatization and a gradual change of management in state-owned businesses, with a mandatory change of business models, development priorities and motivation systems in favor of innovation-driven growth.
8. Further liberalization of requirements for the financial provision of contracts entered into by and between innovative companies and government organizations and businesses.
9. Provision of incentives to banks to enhance opportunities of attracting bank guarantees by innovative companies to secure contracts.
10. Analysis and consistent removal of barriers in the field of technical regulation.
11. Further changes in the existing system of customs administration, the removal of tariff barriers to foreign trade and R&D activities conducted by innovative companies.
12. Extending terms of privileges (including for software developers), which have proved effective in terms of developing innovative market areas.
13. Earlier migration by government organizations and businesses to go paperless.
14. Increased interaction between state bodies, regulators and their business associations, non-governmental organizations and experts.
15. Introducing a policy of 'no state interference' policy in the selection process for technologies, platforms and other technical details; managing technology sectors through performance indicators.
16. Further institutionalization of expertise in all forms, from the development of a federal contracting system to the improvement of the forms of organization for science and education.
17. The migration to a model of 'complete inspection' as a tool to enhance professionalism and form an innovative environment in the emerging knowledge society.

Innovations Infrastructure

Basis for Knowledge-Driven Economy

“Of course, you need to know how to overcome hurdles, but you also need to know how not to put them in front of you..”.

*P. Kapitsa,
winner of the 1978 Nobel Prize in Physics*



Strategy

Providing targeted support to enhance innovations infrastructure facility operations involves raising the level of quality requirements for the services they provide, jointly-financed out of the federal budget and budgets of Russia’s constituent entities, providing instructional and information support to innovations infrastructure facilities.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020

Building an innovation-driven economy is not possible without a strong foundation — innovations infrastructure. It is not only material objects in the form of buildings for business incubators and science parks, science and technology equipment, and so on, that can be called innovations infrastructure. Even one of the earliest definitions of innovative infrastructure to be found in the Russian legislation gives a broad interpretation: Federal Law No. 127 (August 23, 1996) regarding “Science and State Science and Technology Policy” defines it as “a set of organizations contributing to the implementation of innovative projects, including the provision of administrative, logistical, financial, information, HR-related, advisory and organizational services”.

Infrastructure is part of the supportive environment upon which a national innovation ecosystem can be formed. It incorporates:

- physical infrastructure;
- financial support, including venture capital industry;
- service and competence infrastructure, which specializes in providing services to high-tech companies;
- information systems that provide communications and data exchange between those involved in the innovation ecosystem.

The challenge that the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 identifies as requiring attention at Phase 1 (2011-2013) involves the development of appropriate institutions and the elimination of infrastructural gaps, whose presence has hindered innovation processes in the Russian economy.

KNOWLEDGE ECONOMY AND DEVELOPMENT INSTITUTIONS

System for Development Institutions: Tactics and the Strategy.

For Russian development institutions 2011-2013 became a time for reorganization, for new players to emerge and some tactical adjustments to be made "on the move". In particular, in the late 2000s, serious infrastructure constraints appeared, which hindered the emergence of new innovative projects and the successful development of existing ones. For instance, it became obvious that the lack of service companies conducting high-level toxicology and molecular biological research to international standards could greatly inhibit the emergence of the country's biotech startups. While the lack of quality international patenting or global market promotion services could nullify the export potential of Russian high-tech companies (regardless of industry). "Innovative" is not the word to characterize such services; however, they are an important element of support for a high-tech business support system. Meanwhile, since viable demand for such services in the Russian market had not yet

formed, private businesses were slow to fill the void in the service niche. Therefore, it is precisely the line of work that development institutions should have been involved in. It stands to reason that, since 2010, the development strategies of some of these institutions have been prioritizing the incorporation of infrastructural development.

Thus, January 2011 saw LLC RVC Infrastructure Investments (RVC Infracfund), founded by RVC, commence operations. Infracfund's key challenge is developing markets for the professional service technology companies needed by high-performance core operations and rapid development, as well as the promotion of products on the domestic and foreign markets. New infrastructure will provide innovation-focused business figures with advisory services, including for marketing, finance, law, intellectual property and investor relations. Eight out of 12 Infracfund portfolio companies work in the area of advisory services and education.

On March 11, 2011, state Nano corporation Rosnanotekh was reorganized into OJSC RUSNANO¹. The process of reorganization resulted in the establishing of a Fund for Infrastructure and Educational Programs (FIEP), a non-profit organization. The creation of the state innovations infrastructure for nanotechnology, including the implementation of education and infrastructure programs previously launched by RUSNANO, has become one of the

¹ The reorganization was carried out pursuant to Federal Law No. 211 (July 27, 2010) regarding "The Reorganization of the Russian Corporation of Nanotechnologies".

Russian Venture Market Dynamics

Parameter/year	2007	2008	2009	2010	2011	2012*
Total volume of venture capital funds and venture capital sections of PE funds operating in the Russian market, USD mn	800	1 200	1 300	2 000	4 500	6 700
Number of active funds, units	20	28	36	50	112	151
Venture capital investment in the Russian market, USD mn	108	162	123	303	500	1 000
Number of venture deals in the Russian market	34	67	48	81	200	300
Venture capital investment, RVC funds, USD mn	34	40	45	115	79	96
Number of venture deals, RVC funds	7	7	8	39	42	36

Note: the data for 2012 are preliminary.

Source: RVC

Experts' opinions

“Despite all that has been done, the Russian innovations infrastructure is not developing effectively enough. It is still made up of disparate parts. I think the development institutions are still lagging in synergy. And that may lead to the impulses they send beginning to peter out.



The government and the business community should look seriously into making more effective business incubators and accelerators. Most of them have not achieved much, except the Kazan IT park, Ingria in St. Petersburg, the Higher School and Moscow State University incubators.

The government needs to improve the system for financing early stage innovations. Money should be pumped into pre-seed, seed and start-up, and that money must be easier to access. One way to do that is through the players in the system — accelerators, incubators. Another is to actively support business angels.

KONSTANTIN GARANIN,
FOUNDER OF CITYCELEBRITY

“Most Russian business incubators are parts of scientific centers or, more commonly, universities. So the structures that must be the most dynamic and flexible, market-oriented, exist in a very bureaucratic environment. After all, every college or institute is a big bureaucratic machine.



Colleges cannot always spare attention or resources for some small business-incubator, even though it is very important. A university's main purpose is to give good education to its students. This leaves incubators completely dependent on the schools' money. Without any legal or financial authority.

If incubators were companies, they would be much more productive. Non-profit partnerships between universities and business interested in commercializing their R&D are even better. The state could give incubated companies tax breaks or facilities — on the school premises, for example, or finance the incubator's first year (but not more than that). The Ministries of Economic Development or Education and Science could give extra funding to the universities hosting them.

RUSLAN MAMEDOV,
DIRECTOR OF THE PLEKHANOV RUSSIAN ECONOMIC
UNIVERSITY'S BUSINESS INCUBATOR

“In my opinion, the support system for R&D, as it exists in Russia today, cannot very well reach its audience — innovations companies. An R&D firm usually comes “from the bottom”. Typically these companies are very small projects of a few people, who do not have an in with the government or big business. These companies do not usually require a lot of funding or other resources, but they cannot very well develop without external help. Being small and with modest goals at the get-go, these projects are not so interesting for the development institutions with their megalomania. Bureaucratic hassle of providing support to these small companies is significant, and the pay-off not very spectacular. But it is these small enterprises with modest appetites for investments that make up an innovations-based economy. So the only way to make venture financing work is to decrease the scale of the instruments and follow very strictly the progress of projects that receive funding. The most important thing the government can do for start-ups is to quit demanding from them what it demands from stable, established business. People in start-ups, not counting adventurers, are usually excellent specialists in their field, but making only first steps in running a company. They do not have much experience or a tried and true infrastructure for commerce. But the state, instead of helping these companies with accounting, customs procedures, logistics and so on, comes down on them with hard demands, regulations and, if anything goes wrong, fines. This strains the start-ups' relationship with government institutes.



The first thing the development institutions can do is to help start-ups with infrastructure: assist in accounting and tax bookkeeping, give them office space, help with customs and logistics, connect with colleges... The burden of business management should be taken off start-ups and entrusted to special structures with an ecosystem for it.

Second and almost as important is offering innovators long-term credit or backing their loans, combined with oversight of their expenses.

KONSTANTIN KHAIT,
CO-FOUNDER AND CHIEF ENGINEER OF COMPONENTALITY OY

“The Russian venture investment ecosystem's weakest point is consumer market. This goes for both venture exit stages and intermediate steps in projects that require successive investments. Forcing a consumer market to be, and quickly, is hardly possible. But some measures can help it develop. For example, enticing large Russian corporations to buy innovations. But the only fundamental solution is to radically improve the quality of Russian R&D — to the level of world-class breakthrough projects. A real consumer market, with demand for Russian innovations from domestic and foreign customers, would then naturally appear. In the next 2-3 years we should not expect any sensational venture exits. Some may happen in 5 to 7 years, which is normal for the global venture industry. Quantity becomes quality. In spite of what has been achieved in the last 5 years, Russia still does not have enough ventures. The venture industry should spend the next 2-3 years on financing and starting as many early-stage projects as they can. It is early-stage Russian innovations that are the most competitive, as professor Lerner's study showed.



If we can do this, there is a chance that such “quantity” of projects as will have been financed by 2015 may turn to “quality” in 2017-2019.

ANDREY MOROZOV,
CHARMAN OF THE BOARD OF DIRECTORS OF VEB INNOVATION

Fund's main objectives. The Fund is largely subsidized by the federal budget and Rosnanotekh's contributions in total amount to RUB 29.1 bn.

To develop innovations infrastructure, the FIEP is implementing several types of projects — in particular, creating nanotechnology centers and technological engineering companies. The total budget for the infrastructure projects already approved for financing is RUB 31.8 bn, including an investment of RUB 15.9 bn by the FIEP. As of April 1, 2013, the Fund had invested some RUB 11 bn in infrastructure projects, with more than RUB 10 bn contributed by co-investors.

In 2011, the Russian Foundation for Technological Development (RFTD), a developmental institution founded in 1991, underwent restructuring. The Foundation provides financial support in the form of soft loans to targeted application-oriented scientific and technical projects aimed at creating high-tech production facilities. Loans of RUB 30 to 100 million are granted on a competitive basis, for a term of up to 60 months. From 2011 to April 2013, the RFTD decided to grant 13 loans totaling RUB 1.4 bn. Apart from providing financial support to innovative businesses, from March 2013 the RFTD has been supporting some Russia-based technological platforms.

In 2012 the Agency for Strategic Initiatives to Promote New Projects, an autonomous non-profit organization, created by Russian Government Decree No. 1393-p (August 11, 2011), commenced full-scale operations. The approved management bodies of the Agency included a Supervisory Board, Management Board and a CEO; the personal structure was approved by Russian Government Decree No. 1394-r (August 11, 2011) regarding "Appointments at the Autonomous Non-Profit Organization of the Agency for Strategic Initiatives to Promote New Projects" (ASI). Currently, the ASI is working aggressively in accordance with its statutory objectives.

As of March 30, 2013, the Agency is involved with 433 projects, of which 121 are dedicated to innovative subjects.

In 2011, VEB Innovation Investment Fund was established by Vnesheconombank to invest in high-tech projects at the Skolkovo Foundation. The Fund's main strategic goals also include promoting the development of innovative programs of the Russian Government, the formation of innovations infrastructure in Russia, promoting the adoption of advanced foreign technologies in Russia and promoting Russian innovations in the global market. In April 2013, VEB Innovation granted the initial loans at preferential interest rates to two companies which are involved in the Skolkovo Innovation Center.

Stock exchange infrastructure for attracting investment in high-tech companies and small- and mid-cap businesses.

Being listed on stock exchanges and evolving into a public organization is usually the top "rung" for a high-tech company consistently rising in its development up the "venture ladder", from one invest-

ment round to another. First attempts to create an effective stock exchange platform for young innovative companies (similar to the AIM, London Stock Exchange) in Russia were made in 2007, almost at the same time when MICEX launched its Department for Innovative and Growing Companies (IGC) and RTS launched RTS START.

On June 5, 2009, MICEX Group and RUSNANO signed an agreement on establishing a new stock exchange department on the basis of the existing IGC sector — the Market for Innovations and Investments (MII). Therefore, the platform was practically re-launched with the full support of a new partner.

To use the platform for placing securities, the company's capitalization should exceed RUB 50 million, with a significant portion of its revenue generated through activities employing innovative technologies and methods. To support candidate innovative companies to place securities, the Russian Ministry of Economic Development and Trade introduced a special subsidy that compensates up to half the cost of preparing an IPO on the MII (but not more than RUB 5 million).

Being listed on the MII enables innovative companies to obtain a market valuation of assets, attract investors, improve transparency and increase the value of the company, get traded shares — a tool for M&A transactions and use as collateral, as well as to attract loans at lower rates.

Sector statistics for the MII, MICEX², 2012, are as follows:

- total market capitalization of issuers at the end of the year — RUB 38.62 bn (about USD 1.24 bn);

² Created by the merging of two platforms — MICEX and RTS — in December 2011; the new name of the combined stock exchange came into common use in the second half of 2012.

Main indicators of the investment activity towards early-stage companies, Russia, 2007 to 2011

	2007	2008	2009	2010	2011
Share of investments in early-stage companies in the total amount of venture capital investments, %	4,1	4,6	2,6	0,9	4,2
Number of investment deals with early-stage companies	18	38	18	39	85
Volume of investments at early stages, USD mn	43	69	15	20	130

Source: "Venture Capital Investment Market at Early Stages. Key Trends", research work". Russian Public Opinion Research Centre (VCIOM) and RVC)

- total annual trading volume in the sector — RUB 13.95 bn (an increase of 50% on 2011);
- total funds raised at six IPOs — over RB 750 million.

As of April 30, 2013, 33 securities were allowed for trading on the MICEX's MII — 25 shares and 8 equity units (closed-end funds).

Like many of the structural elements of the innovations infrastructure, the MII sector, at the initial stage of operations, faced an acute shortage of quality companies ready to place their securities. Therefore, in early 2012, a project titled IPOboard was launched — to organize a “preparatory department”

EXPERT OPINION

“Russian venture market, in its industrial technology segment, is suffering from investors’ lack of competences and experience, whether they are “angels”, manufacturers or investment funds.

Russia had other priorities and problems to take care of than commercializing research in the last 20-25 years. Only recently this sector started to show signs of life. Investors and project managers started to venture into industrial innovations — though still with care. Neither usually have experience building technology business from scratch. The experience they have working with financial markets, real estate, in management of stable companies may help. Or it may harm, if the company is an early technology project — a couple of scientists or engineers with a prototype. There we have a completely different level and character of risks, and different ways of management are needed, including team management.

For their part, Russian researchers and engineers have a vague understanding of how to build a business around a technology, however unique and breakthrough it may be. Another difficulty, from a long list, is that there is almost no real demand for innovations in Russia, despite all that is being touted. We need to exit to international markets, and that does not make this already difficult situation any easier.

Venture funds could play a central role in commercializing research. Their teams could become, and are becoming, focus points for necessary competences. Each team can in return “pollinate” tens of start-ups with business competences and connections to help it exit to Russian and other markets.

The situation has definitely improved in terms of venture money in the industry. But lack of funds is still felt at all project stages. The important thing is not to confuse investment PR with real availability of funding and its effective use.

What we need is projects where the investor gives the money and lets the portfolio company grow, checking its progress from time to time, correcting strategy and so forth at board meetings. There are no or very projects like that. But we do have plenty of interesting ideas and technologies, and talents, too — although not as many as 20-25 years ago. Many scientists have emigrated and continue to emigrate, unfortunately. As one of my colleagues said, our investors and funds want to “bring up champions, but do not care or cannot take care of diapers, tantrums and the diet”.

Even in the Silicon Valley successful venture funds are involved in building up businesses, not just financing them. The best-known and oldest venture company, Kleiner Perkins (KPCB) positions itself as a team that helps entrepreneurs create and develop their companies.

As far as “smart money” is concerned, where would it come from, if we have only recently started to take interest in innovations and commercialize research? Venture money is not born “smart”, it becomes smart by gaining experience in a Darwinian selection from a large mass of ordinary money. There are many factors in venture business success, including luck and riding the right “wave”. Innovations venture is the right “wave” — there is large demand for investment money there globally. The world economy remains as cyclical as ever. And so those who are investing now, in 5-6 years will be exiting in another phase of the “wave”.

Other things being equal, the more “ordinary money” goes into ventures, the more “smart money” comes to venture high-tech in the end.



VALERY KRIVENKO,
MANAGING PARTNER OF BRIGHT CAPITAL

for promising innovative companies planning to be listed on the stock exchange. The project is being implemented on the basis of an independent legal entity, but in close collaboration with the MII sector. IPOboard is an electronic information and trading system to raise funds by promising non-public companies from the innovative sector of the economy. It is a kind of incubator for future public companies, which has three levels: initial, basic and pre-IPO. The basic level can be reached by companies that have received a recommendation from so-called “expert partners” (RVC, RUSNANO, Skolkovo Foundation, SME Bank, Foundation for Assistance to Small Innovative Enterprises in Science and Technology (FASIE), etc.); the level of pre-IPO is awarded to those entering into an agreement with so-called Board-guides, whose task is to prepare the company to entering the stock market (a number of accredited listing agents, venture partners of RVC and companies experienced in making transactions in the equity markets can act as board-guides).

The IPOboard partners are: RVC, Skolkovo Foundation, Moscow Department for Science, Industrial Policy and Entrepreneurship, Center for Innovative Development, Russian Venture Capital Association (RVCA), Moscow Seed Fund, Zvorykin Project, and a number of business incubators, accelerators and science parks in Moscow and other Russian regions. The RVC Infrafund project has proved an important element in the tech business investment infrastructure through its incorporation into the IPOboard equity capital, which was announced in April 2013.

Development Institutions: first outputs of portfolio (project) companies.

In 2012, RUSNANO successfully withdrew from projects that it had previously invested in:

- NTO IRE-Polus, world’s leading manufacturer of fiber lasers and advanced telecommunications equipment (full withdrawal; funds received — RUB 1.8 bn; yield — about 27%);
- Center for Advanced Technologies, manufacturer of scanning probe microscopes (funds received — RUB 29.7 mn; RUSNANO retained a “golden share”; yield — 29.5%);
- Ruskhimbio, operator of a reagent warehouse chain in a number of Russian cities, characterized by a large product range and streamlined delivery system (funds received — RUB 73 million, RUSNANO kept a minimum share the authorized capital to the amount of 1%; RUSNANO yield — 27%);
- Trackpore Technology Holding (partial withdrawal; funds received — RUB 98 million; yield — 11%; full withdrawal scheduled for 2013).

In 2013, the withdrawal from a Pruzhina R&D Center project was approved and initiated. It is planned for a stake to be acquired to the amount of 19.99% from the existing co-investor at a price not exceeding RUB 218 million and a consolidated

share of 69% to be sold to a new investor at a price not less than RUB 766 million. RUSNANO's projected yield is at least 18%.

In February 2012, the Seed Fund withdrew from a company it had previously invested in, with a stake in the company's authorized capital sold at a price of RUB 10.5 million and a 20% yield.

Networking and coordination between all innovation ecosystem elements.

Given the young age of the innovation ecosystem that has been formed in Russia, the issues of aligning its structural elements and harmonizing the interests of the state and its institutions of development, science, education, business, and venture capital were particularly acute at Implementation Phase 1 of the Strategy (2011 to 2013). In particular, "teething problems" may include the fact that the participants of the Russian innovation venture capital market are often half-aware of: how much support they could receive from the existing innovative infrastructure; which projects by their colleagues representing related sectors are under way; and where they could find partners and investors to implement innovative projects, and so on.

For example, it is particularly indicative that until recently Russia kept no federal registries of innovative infrastructure facilities created with public funds. These facilities — built at different times since the early 1990s, with different government figures in power, in accordance with various government programs — fell under a different departmental jurisdiction, so that even collecting statistical data on their quantity and specialization (not to mention the evaluation of their performance) was greatly hindered. Of course, the absence of such open-access information, in a single database, also causes problems for potential innovations infrastructure facility users.

As part of the Strategy, work on drafting the federal register of innovations infrastructure facilities has been assumed by the Ministry of Economic Development. In 2012, the Ministry developed an innovations infrastructure classifier and forms for reporting information. Based on the methodological framework developed, all the constituent entities of the Russian Federation have been consulted and a consolidated register of all facilities

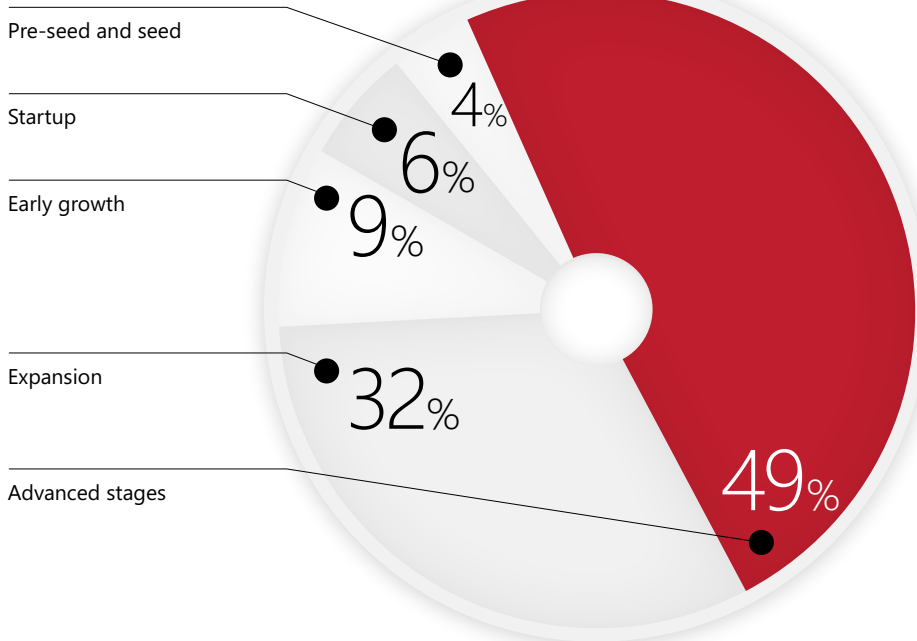
created through public funds. Innovations infrastructure facilities are organized into three major groups:

- production and technology infrastructure;
- information and expert consulting infrastructure;
- financial infrastructure.

Given the database required constant updating and access was needed by a wide range of people, the Ministry of Economic Development has decided to integrate the Unified Research & Information Portal for the State Support of Innovation Business Development, currently in development, into the

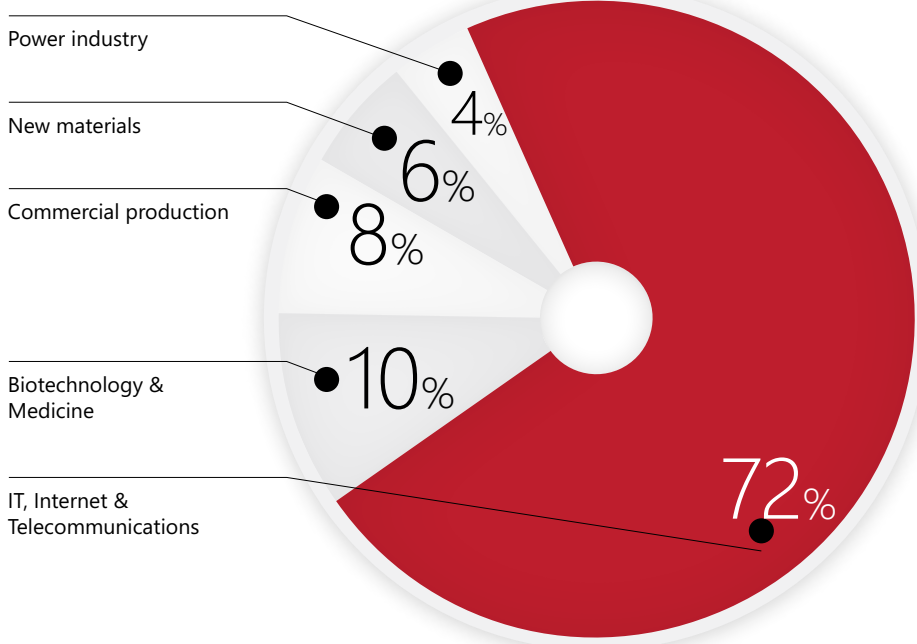
Distribution of the supply of capital in the venture capital market, Russia, 2012, %

By stages of growth



Source: RVC, February 2013

By industries



The composition of the Russian venture capital market in 2012 clearly demonstrates the existing imbalance — the lack of the supply of capital to early-stage companies and a clear bias towards the IT and Internet projects.

Source: Expert evaluation by RVC

Experts' opinions

“In Russia today a start-up founder has many potential sponsors. But some of them are state-owned, and getting funding from them takes a long time — half a year or more. Private investors can have funds ready in anywhere from a few weeks to a few months. This is a normal time-frame by world standards.



SERGEY MALTSEV,
CEO OF ROBOCV LLC

Overall the Russian market has enough investors, and funding a project is quite possible. But there is a systemic problem. Investors care mostly for IT and Internet services or late-stage projects, when money is needed to increase scale, not to found a business. As a result, “serious” high technology is overlooked, especially early on.

Russian legislation still does not very well address work with... This is why projects are choosing Western jurisdictions, only formally remaining and doing research here. And the revenues also mostly end up abroad.

“The Russian “innovations lift” is already working. But the main problem is lack of professional competences for the early stages of commercialization and technology transfer, when science is becoming business. The market needs most of all “packaging” companies and seed investments.



YEVGENY YEVDOKIMOV,
CEO FOR INFRASTRUCTURE OF RUSNANO

RUSNANO's nanotech centers should help solve that problem. Business incubators should work on it too. More of them have been coming up in the last few years, but they still cannot always “package” a product professionally. What the government should do is, first, continue to improve the infrastructure for early-stage projects, and second, give more freedom and independence to budget-funded organizations, allow them to find private partners for seed stage investments. The government should also help create more communications platforms where scientists and inventors could meet with business, stimulate colleges and research institutes to set up technology transfer centers. Every university should have one. And it should be more than a sign on the door. These centers need to have a full range of features, with professional teams finding, preparing and starting projects.

“The development institutions created in our country are among the main driving forces of the state innovations policy. Company group IT Co. has collaborated with them actively over the last years. For example, two of our companies — Unicloud Labs and MobilityLab — are Skolkovo residents.



We have received subsidies for three projects under Government decree No. 218, State Support for Colleges and Organizations in High-Technology Manufacturing. We are involved in research projects with ITMO and the Higher School of Economics and collaborate with a number of investment funds.

The development institutions are a fact, although they are in their early stages. A quick review of a few flaws could help them to a better performance. The first of these flaws is complex bureaucratic requirements and various reports to be compiled. In our experience, this paperwork is very labour-intensive, absorbing up to 25% of the budget. Another defect is that the terms of a long-term state contract — e.g. for three years — cannot be amended. In three years technologies, priorities, methods can all change! But we have to abide by every letter as it was set down. As far as incentives for innovators are concerned, social insurance relief for software developers has paid off nicely. Besides direct support of providers of high-technology products and services, stimulating IT exports is coming to the fore. Last year the growth of our IT market slowed down noticeably for the first time. In 2012 and, forecasts say, in the next few years the growth rate is expected to be below 10%.

The potential for quick growth of IT on domestic demand alone is more or less exhausted. But the global market is vast, and our experience shows Russian goods and services to be quite competitive. Suffices to say, Russian software and electronic services exports in 2012 amounted to almost \$4 billion. Indian, South Korean, Brazilian experience on the global high-technology market shows about \$1-1.5 for every \$1000 worth of output to be state money. Of course, we do need assistance with making business connections, participating in exhibitions and fairs, co-operating with foreign R&D centers, and we do understand that state involvement could reduce external market exit times significantly.

TAGIR YAPPAROV,
CHAIRMAN OF THE BOARD OF DIRECTORS OF IT CO. GROUP OF COMPANIES

“The Russian start-up community has come to life in the last several years. All sorts of events are organized, for example, professional “parties” where start-up founders can socialize, learn to pitch their stuff, receive experts' advice, which is also important. And it has become clear where to find money, if you have an idea. Information on the market, grant applications and venture investments is open and available.



There are lists of training events being published. The development institutions and industry Web resources put online “registers” of investment funds. Now everything depends on the energy of the entrepreneur himself. If you have not got the knowledge, talk to an expert, read the books. If you have not got the money, be prepared to improve the business model or your product.

The development institutions should develop even more private co-financing programs. Finding new funding formats is also a good idea. For example, Moscow Development Fund for Venture Capital Investment in Small-Scale Science Research & Technology Businesses has an original system. It lends start-ups money if a private investor also joins. And the program works as an investment loan.

The state should also step up awarding small grants, up to a million roubles, so that a person could make his innovative ideas reality.

ALEXANDER ZHURBA,
CO-FOUNDER OF GENEZIS CAPITAL VENTURE FUND

registry. This will allow information on innovations infrastructure facilities to be structured and updated, including through personal accounts, directly by representatives of innovations infrastructure facilities and through user feedback, which should ensure its quality and applicability without significant extra financial outlays. Commissioning for the system is scheduled for 2013.

The creation of an open-access database to have brief information (containing no trade secrets or know-how) incorporated on all the innovation projects supported by development institutions was another IT project, vital in terms of improving data exchange within the innovation ecosystem to improve the exchange of information within the innovation ecosystem. The issue of establishing such a database was raised in 2012 by a task group involved in forming of the agreement concerning cooperation between development institutions and interested businesses to secure the continued funding of innovative projects at all stages of the innovation cycle.

In 2012, Vnesheconombank reached an agreement in principle with the France-based Fund for the Support of Small- and Medium-Sized Innovative Companies under OSEO, a state-owned company³, on the deployment in Russia of EuroQuity (Euroquity.com), an information and communication system for the interaction of small- and medium-sized companies and investors. This online service was launched by OSEO in France a few years ago and has evolved into a successful platform, which brings together startup communities and investors (the system has over 7 million registered investors, more than 4,000 companies, with investments of EUR 85 million raised). In 2012, through agreement with the German banking group KfW, the service was launched in Germany. It will launch in Russia in 2013.

In recent years, the practical work of development institutions has demonstrated that selecting and reviewing innovation projects that request funding also requires a greater level of information exchange. Vnesheconombank has initiated a draft agreement for development institutions on such an exchange. The agreement should allow parties to exchange the information in their possession on financing applicants, investment projects proposed for implementation, the status and results of reviewing applications for financial support and other information related to projects, including external expert opinions, marketing and other studies prepared in the course of reviewing the applications.

3 A French state-owned company, established in 2005 by the government to help small- and medium-sized business to develop and implement technological innovations. Emerged from the merger of the National Agency for Research Valorization (Anvar) and La Banque de développement des petites et moyennes entreprises.

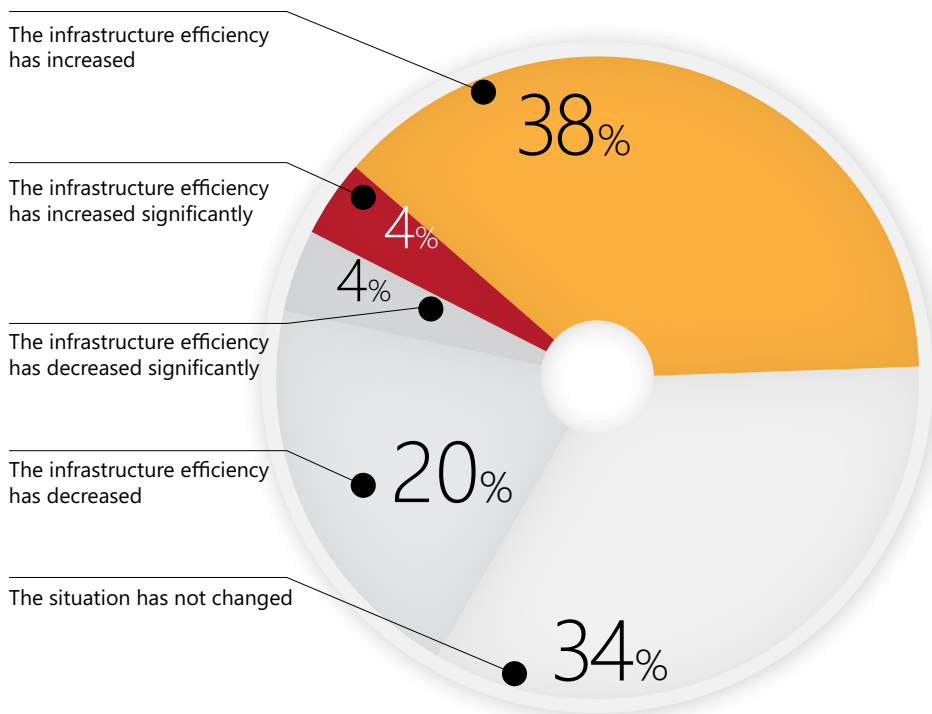
A draft agreement has been developed taking into account existing confidentiality agreements entered into by development institutions, and will ensure compliance with Russian legislation on trade secrets and the protection of personal data when development institutions exchange information. Currently, the project has been finalized with due regard to comments received from development institutions.

INFRASTRUCTURE OF FINANCIAL SUPPORT FOR INNOVATION PROJECTS AND VENTURE CAPITAL MARKETS

Investment and business partnerships.

At Implementation Phase 1 of the Strategy, the joint efforts of the development institutions successfully solved the problem defined in the document as the “alignment of legal forms of venture capital funds and companies financed by them”.

Changes in the efficiency of the emerging innovation-supportive infrastructure in Russia over the past two years?



When interviewed, the respondents expressed a rather high opinion toward the development of the support infrastructure for innovation in Russia. 38% of respondents believe that the infrastructure has increased, and 4% — that it has increased significantly. Thus, more than a third of the market participants (42%) rate the work of the state and development institutions on building the support infrastructure for innovation in Russia as successful.

Source: Survey of innovation market players, RVC, 11-24 April 2013

Experts' opinions

“As far as developing infrastructural support for innovations, a great deal has changed in Russia in the last few years. Thanks to the media, public opinion on business and innovations has changed drastically, and so the image of a successful innovator is becoming more popular and attracting a young and ambitious crowd. I think this is an important change, considering Russia's low level of entrepreneurial activity (not surprising, since there was no such thing in the Soviet days).



But, to my mind, the government still does not invest enough in connecting the infrastructural objects it creates with a wider environment. Technoparks and incubators, not to mention colleges, communicate very little with business and foreign colleagues, do not care to understand market tendencies.

The funds they receive are spent mostly on what can be shown — buildings, equipment. Most likely, this is habitual thinking making itself felt: if there is a physical infrastructure, collaboration is expected to appear of itself. As a result, many objects in the innovations infrastructure today remind me of computers without software.

Few consider the fact that people's time, and time of technopark and incubator workers, costs money. It is not a free resource. Administrators of infrastructure objects are needed to improve communication. These people cannot work exclusively pro bono. That is an issue I'd like to draw attention to.

Also, compared to the situation of two-three years ago, many more innovations-related events are organized. Information about the market is available, there are opportunities for dialogue. But sometimes involvement in too many events detracts from deep and serious work on human resources, and the event format cannot replace consistent manager training. Unfortunately, there are few long-term programs for it in Russia, few training courses or internships.

Aggravating the HR problem at technoparks is the government policy of budgeting money for the “walls”, for equipment, but very little for salaries and training. This explains high turnover at new technoparks. But to understand the innovations industry, one must spend quite a long time working in it. Many say real understanding takes at least 10,000 work hours. Growing personnel and motivating workers to stay in this field and change it for the better is vital.

Innovations infrastructure is more than the “walls”. It takes consulting upgrades, teams, competences. Without them any technopark is at best an architectural curiosity.

YULIA ROELOFSEN,
MANAGING PARTNER OF INNOPRAXIS
INTERNATIONAL LTD

“When we talk about an innovations infrastructure, we need to understand that there are no “more” and “less” important elements. An ecosystem relies on interaction and active involvement of all market players. Many incubators were created in Russia over the last years: federal, regional, university-based... There are incubators at technoparks, too. These objects have been “physically completed” and need to be complemented with better services.



At the moment most incubators lack high-quality projects, which reflects the general market situation. Another handicap is obvious lack of financing for early-stage projects, when prototypes are improved and markets tested. Add to this non-existing business competences in universities and research institutes. They, too, reduce “entry flows”. There are few business angels and seed funds in Russia. So moving a project from an incubator to the next “floor” is rather difficult.

Why are the business incubators and technoparks so often empty shells? The first reason is that they are almost 100% dependent on state subsidies. The second reason — and this is more important! — is that we have very few private incubators and technoparks. Businessmen see no reason to invest in an infrastructure that will pay off only in 10 years or more. The result: a felt shortage of good projects on the market. Not enough “raw material”. And the incubators and technoparks that already exist have yet to produce their “success stories” that would motivate other potential investors and organizations in the infrastructure.

An infrastructure cannot work efficiently if it exists only on state subsidies encumbered with bureaucracy, enormous reporting demands, formal approach to project selection. This increases the risk of getting “crippled”, low-quality start-ups. Incubators need to become normal companies with several funding sources.

Then they may be able to offer professional consulting, in addition to office space, and begin to attract projects likely to end up as stable and profitable businesses.

ANASTASIA TYURINA,
GENERAL DIRECTOR OF THE INNOVATION CENTER,
HIGHER SCHOOL OF ECONOMICS

“The reason Russian innovations market is short on “packaging” and service companies is because services are provided very differently to industrial companies and innovators. When a consulting company advises a well-established firm, it sees clearly defined objectives and can count on being paid. Working with innovators is fundamentally different: the consultant invests its time and expertise, but it must also have a degree of experience choosing projects, seeing its prospects and marketing potential from the get-go. Because the innovator will only be able to pay if successful. So the “packager” has to become a kind of business angel, serving as a financial advisor, structuring the project, developing documentation to impress investors and taking risks. Getting a project in shape so that it can be shown to investors may take up to three months, and the “packager” all the while runs into lack of understanding on the customer's part.



As far as support infrastructure is concerned, RVC's InfraFund, I think, has been fairly successful in helping it along. This kind of stimulus from a development institute can assist a company from project stage to sales.

YELENA TROFIMOVA,
GENERAL DIRECTOR OF ICDI

In the late 2000s, the first practical experience in creating a venture capital industry in Russia demonstrated that none of the forms of business ownership applicable at the time was fully consistent with the practice of venture capital investment. The most common form — LLC, CJSC, OJSC — did not provide the required flexibility for the relationship between investors and companies involved in innovation activities, while greatly hindering operations of parties to the contracts. In view of these circumstances, an urgent need for new legal forms has emerged — both for venture capital funds and innovative engineering companies. The concerns of the venture community have been heard by the legislative establishment, which eventually resulted in the adoption of two federal laws — “On Investment Partnership” (No. 335; November 28, 2011) and “On Economic Partnerships” (No. 380; December 3, 2011).

The investment partnership is a legal form that enables the financial resources of several participants to be combined to invest in high-risk projects and is essentially an analogue of limited liability partnerships (LLP), used for establishing venture capital funds in some countries. The characteristic feature of the investment partnership is that the partners (self-employed entrepreneurs and legal entities, from two to a fifty in number) aggregate their contributions and invest jointly, without forming a legal entity, so that increasing or decreasing the volume of the venture capital fund requires neither an increase or decrease in the authorized capital nor the additional issuing of shares (as is the case with joint stock companies). In this case, partners are divided into “simple” and “managing”. The latter conduct business on behalf of the partnership and are responsible for the fiscal records and the opening of bank accounts, and such like.

Economic partnerships, in the view of the legislator, should become a convenient legal form to create innovative design companies. It is distinct from other forms in that the participants are given considerable freedom to structure internal relationships, the ability to choose how to control the business, and the flexibility to choose how to deal with rights and duties. At the same time, economic partnerships have no requirements for minimum equity, along with the simplified procedure applied for increasing and decreasing the size of the contributed capital (which facilitates the conclusion of investment transactions with them).

Although Law No. 335 came into force on January 1, and No. 380 — on July 1, 2012, neither law has yet enjoyed wide practical application in either the Russian venture capital investment or private equity markets. RVC says this is because investment partnerships as a form of co-investment are at an initial stage of development — and to be used fully by industry players they need to improved a great deal more, both in terms of practical and institutional development. To facilitate this development, RVC has begun drafting model articles of investment partnerships. The draft

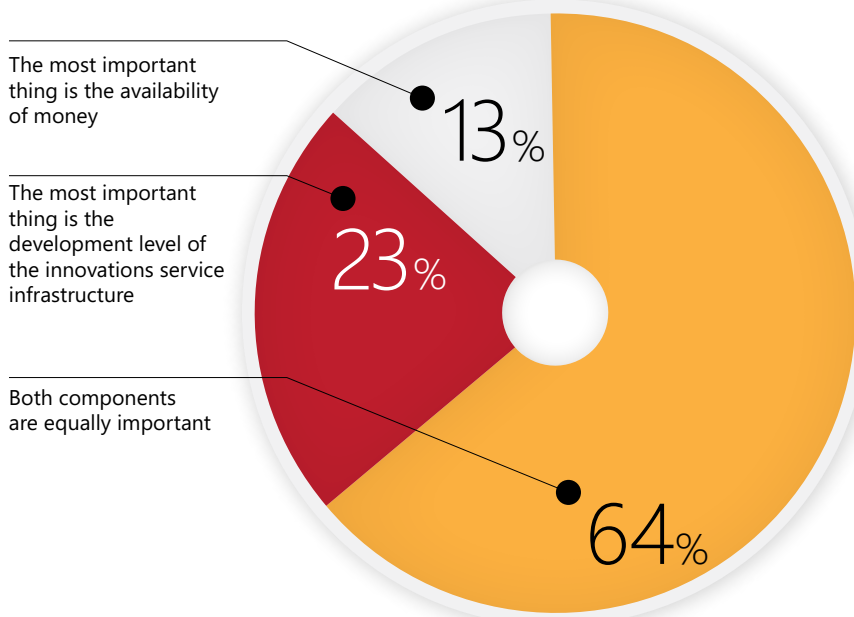
articles, which are based on the best international investment practices in view of all the requirements of Law No. 335, were submitted on April 24, 2013.

The model articles provide new possibilities of structuring joint investment activities of market participants and incorporate a variety of solutions to the issues subject to the dispositive legal regulation in accordance with Federal Law No. 335 regarding “Investment Partnership” as amended April 25, 2013. Parties to the specific investment partnership articles may, at their discretion, use one of the means to build relationships within the partnership, proposed by the model articles, taking into account the characteristics of controls formation and earnings distribution, or use any other statutory compliant means to formalize the relationship.

Development of the Russian venture capital market in 2012.

The dynamics of venture capital market growth were increasingly defined by private venture capital, rather than by means of state development institutions, such as RVC, which was originally conceived as a fund

What is the most important thing for the Russian companies involved in the creation and market launch of innovations at the current stage?



When interviewed, the market players decisively spoke in favor of the state and development institutions’ continued use of a balanced set of instruments, financial and otherwise, to support innovation.

It goes without saying that the need of “available money” in the innovation market has largely been satisfied. Only 13% of respondents find this support instrument essential, while 23% think that the continued development of the support infrastructure for innovation is more important.

Source: Survey of innovation market players, RVC, 11-24 April 2013

Experts' opinions

“ Oftentimes start-uppers lose an inordinate amount of time applying for state support. The paperwork involved demotivates them from using what is available. Also Russia still does not have an environment like that in the Silicon Valley. We need one that is practically saturated with innovations ventures.

There are problems with very early-stage financing. Development institutions should create large-scale incubators where innovators could mix productively with each other and with the support foundations.

To make venture money easier to raise, it'd be useful to have special platforms for young companies to plan their course. Finally, we also need a common “register” of investors with very clear profiles, fund by fund: what industries it invests in, what stage companies and so on.

To make innovation popular, it needs to be a part of the national identity. Show real heroes in the news, not moguls' success like now. Everyone knows about big business. We need coverage of real people from small and medium business who have gone and made start-ups with their own hands.



KIRILL VOYTSEKHOVICH-KASANTSEV,
FOUNDER OF ONLINE SUPERMARKET CLICK & PAY

“ The government is making large and important efforts to support R&D. But focus and efficiency are problematic.

On the positive side I can say that development institutions, at least federal-level, are much more focused and efficient than the ministries. But much less than they could be. A glass half.. as they say. The most sensible idea that is now becoming strategy is public-private co-financing. Especially in joint investment funds run by private, professional managers. State investment funds at the moment do not work so well, at least in IT. This goes for the ASI fund and for Skolkovo's grants policy.

That is a good attempt, but so bureaucratic. But tax incentives are an excellent idea, very sensible.

I think the government should let go of the development institutions somewhat. When I meet with their representatives, I hear “audit”, “report” and “procedure” much more often than “start-up”, “innovations” or “breakthrough”...

A project stage can last 45 days, and the grant committee needs 60 days to examine it. That does not help weed out fraud much, too: a dishonest employee of a development institute or a cheating start-upper can find a clever way around every inspection. But honest start-uppers with real innovations get discouraged by this kind of red tape. How to make it so the development institutions have their hands free but the money does not get stolen? That is the question we need to answer. And have more trust in managers with a good reputation — Agamirzian, Vekselberg, Chubais. The same goes for respected and experienced venture investors who can be trusted to handle state investments along with their own. It is Runa Capital, ITech, Almaz Capital and some others.

Of course, education, demographics or building infrastructure in the country is more important for the government than throw billions into seed investments. That approach could not only waste the money but actually do harm. Private funding will flow to industries that show promise without the government, just create the right conditions for it. And if the government wants to invest directly, it should only do that in partnerships, as a co-investor.



ALEXANDER CHACHAVA,
MANAGING PARTNER OF LETA CAPITAL

“ I see a disturbing trend to complicate the innovations support infrastructure every few years. The government's attention switches completely from what has done 3-4 years before to some new element. As a result, we have practically abandoned what was created around 1991.



In the beginning there were technoparks, and they were all the rage. Tens of them were announced. Then they went out of the spotlight — let them survive as they may. Around 10% of the technoparks then started did survive. After that, they started creating innovation centers. About 60% of their number are still around, which is, incidentally, not bad! Nowadays there are 27 working centers with combined area of more than 170,000 square meters. More than 1,500 R&D companies with 24 billion roubles of total production output reside there, and they employ over 16,000 people.

The next step was technology transfer centers. The government gave money to found them, gave money for the first year to keep them functioning... then abandoned them. The next novelty was special economic zones, incubators, clusters, engineering centers... And every time it is a new program, from scratch, without learning from mistakes, without supporting what has begun to grow and coordination. All they care about it demanding huge reports every quarter. Colleges' technology transfer centers are a good example of this. All they do is send endless reports of every kind to the Ministry.

It is obvious that the government bets on projects that are fashionable at the moment, but once they are not so hot anymore, they get forgotten and something else begins. I think it is time we have learned to set objectives for the infrastructure already in place, assign it, on a competitive basis, what tasks we need done, instead of every ministry and office having its pocket structure they have to feed every year from the budget, coming up with tax breaks to give them to attract R&D there. A fresh example: the recent Duma session about technoparks. They talked about how we need a law about the parks and give them special tax incentives! And that is with billions already being invested in that program! What more incentives do they need?! Especially considering there are examples how these structures can work very well without any tax breaks.

What the government ought to do is support innovations systematically, not keep coming up with new things that will be “fun” to sponsor. It is like a sculptor moving to the next piece before he has finished with the first one, then to another... Our researchers, by the way, tend to jump too. They also love “inventing”, coming up with ideas. But when it comes to acting step-by-step to take a technology to market, it is easier for them to just give up and start being “creative” for the next “breakthrough”.

We have a lot of scientists with many prototypes sitting around, but hardly any complete products. All of us — the market players, the government — need to learn to work methodically, finish what we have started. The whole Russian innovations system needs to be based on that.

OLEG MOVSESYAN,
DIRECTOR OF MOSCOW STATE UNIVERSITY'S
SCIENCE PARK

of funds, to be used by the government for the promotion of venture capital investments. This was a very important result for 2012. Over the past three years the size of venture capital investments in Russia has more than tripled (from USD 303 million in 2010 to nearly USD 1 bn in 2012). Throughout this time, RVC has been increasing the supply of capital to the market in absolute terms, but has been losing in terms of its share, due to the significant increase in private investors' activities and the launch of market reproduction mechanisms.

Last year's exponential growth of the Russian venture market (which doubled compared to 2011) could not go unnoticed by international research organizations and this has been recognized by some international rankings where Russia's performance has improved. At the end of January 2013, it was announced that, according to findings by Dow Jones VentureSource, Russia had climbed to 4th place in Europe in terms of venture capital investments in high-tech industries. Some experts from the Wall Street Journal, commenting on the result, described the situation in Russia as a venture capital boom⁴, and called the Russian venture market the fastest-growing in Europe. In 2010, Russia lagged behind Ireland, Finland, Spain, the Netherlands and Sweden in terms of venture capital investments, but by the end of 2012, it had entered the top five.

Meanwhile, the findings by Dow Jones VentureSource and the Wall Street Journal being positive for Russia, according to RVC estimates they are actually conservative. The Russian market lacks transparency, a fact which leads to a large number of transactions going unnoticed by analysts and researchers; not only are the basic parameters of the transaction unclear, but the transaction itself remains hidden from view. In addition, the overall rating by Dow Jones VentureSource has included data on investment only from sectors such as IT, Internet, telecommunications, e-commerce and online support for traveling and leisure. Data on transactions in industry and biotechnology, medicine, new materials and other industry sectors has not been considered. Therefore, it can be assumed that the actual level of development of Russia's venture capital market is much higher than suggested by the report.

Nevertheless, a large number of issues associated with the future development of the Russian venture investment market still remain. As estimated by RVC, these issues are derived organically from the analysis of the current state of the industry:

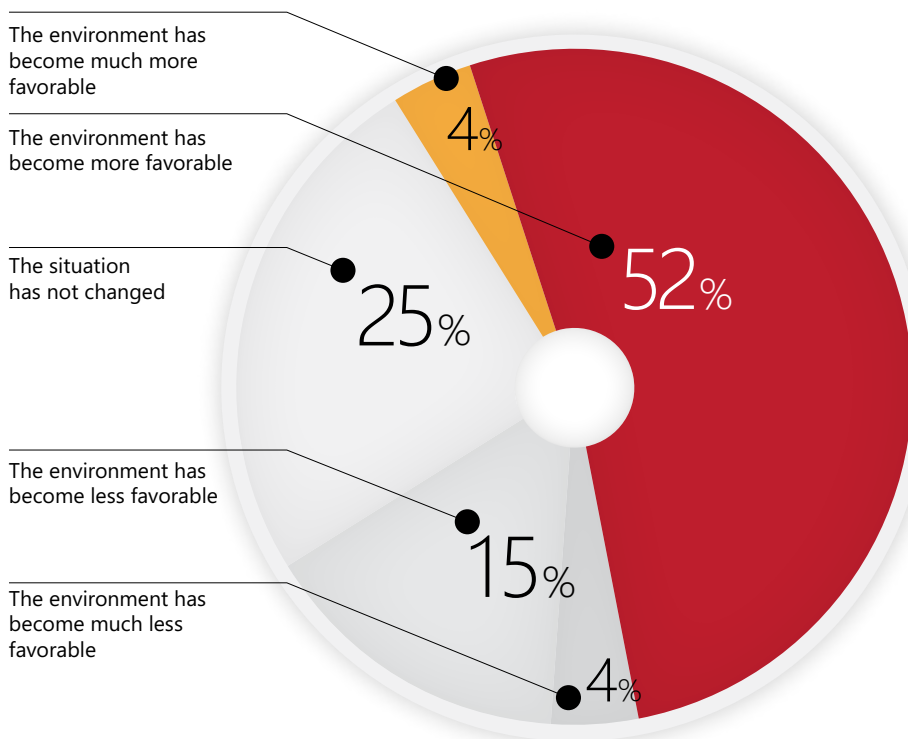
- total annual supply of capital in Russia's venture capital market exceeds qualified demand (by 6-7 times, compared to 4-5 times in developed markets);
- investment tools of the venture capital market available are not the same across the country,

while regional ecosystem of venture investment have all the necessary elements in a limited number of innovative regions (Moscow, St. Petersburg, Kazan, Tomsk, etc.);

- structure of money supply in the Russian venture capital market is also far from being perfect and has a clear imbalance. In particular, there is an acute shortage of capital supply at the seed and pre-seed stages, as well as in most of the priority sectors, except for IT, Internet and telecommunications;
- in addition, the Russian market has a high proportion of international capital ready to be invested in Russian startups, but with no industry-related knowledge and experience to work effectively in the Russian Federation.

In general, according to RVC, as of early 2013, the venture market in Russia was at the stage of initial intensive upstream development, which, judging

How has the environment for the emergence and commercialization of innovations in Russia changed over the past two years?



The respondents have expressed a positive assessment of the situation. 52% of respondents believed the environment for introducing and commercializing innovations in Russia have become more favorable, and 4% of respondents believed it was much more favorable. Thus, 56% of those interviewed gave high marks to the efforts by the government and development institutions to create an innovation-friendly environment.

Source: Survey of innovation market players, RVC, 11-24 April 2013

⁴ See: U.K. Leads European Venture-Capital Funding, but Russia Is Fastest Growing // TECHEUROPE. URL: <http://blogs.wsj.com/tech-europe/2013/01/29/u-k-leads-european-venture-capital-funding-but-russia-is-fastest-growing/> (referral date — May 5, 2013).

Experts' opinions

“The innovations infrastructure created in Russia often supports projects invisible to private business and outside of the real market.

In theory money put anywhere in the Internet industry is good news. Innovations companies develop preferences, small ecosystems. But this creates problems, too. Instead of doing what is right by market standards, development institutions have to account for every step they take. As a result money often goes into projects whose chief competence is not advanced technologies and strong business ideas but expenditure reporting. A kind of “shadow” high-tech appears. We, players from the real market, do not go there. Those are different people, with different human resources, different salaries and different mentality.

Make no mistake, fashionable R&D babble managers like so much and real start-ups are two different things. And there are few quality start-ups so far. But what we see is more and more people in the market with “shadow” Internet projects. Their main argument is flashing papers from development institutions that “confirm” their project is innovative. Do we really need this “shadow” high-tech?



GERMAN KLIMENKO,
FOUNDER AND OWNER OF LIVEINTERNET

“The government needs to set strategic objectives for innovations in particular industries and for upgrades — not only with imported equipment. It needs to support manufacturers who are actively introducing Russian-made innovations to production cycles — possibly with subsidies or tax remissions. This would create demand for R&D, which right now is almost zero.

Manufacturers could work with development institutions and be a target audience for projects. Unfortunately, that niche is right now filled very nicely by foreign companies. They get Russian know-how, commercialize it and sell us back as equipment. All the revenues stay out.

The development institutions should interact more with colleges and help their R&D centers. “Packaging” companies need to be colleges’ partners and serve as market experts and financial advisors for projects. Then it would be possible to sort out early on profitable projects from unprofitable.



YELENA TROFIMOVA,
GENERAL DIRECTOR OF ICDI

“We as a seed stage investor are feeling a lack of incubators to help start-ups choose the right business model and lead the product to market. There are incubators in every region of the country now, but they are still not what investors want. At best, they offer office space. They cannot provide the most valuable service — consulting. The incubators need mentors, technical experts who could bring market competences to innovation projects. Besides, in most regions the incubators are somewhere in the back country, hard to get to.

Every seed fund’s main problem is not enough quality projects. But a fund like ours, to work effectively, needs to have tens of companies in its portfolio. Objectively! Otherwise the fund cannot make money.

How to address that? Keep developing entrepreneurial culture in Russia. People still look down on a business carrier. That needs to change. Business needs to be touted, with more and more people getting involved in R&D. Another bit of advice for the government is to develop first of all the “smart” infrastructure.



DMITRY KALAYEV,
MANAGING PARTNER OF REDBUTTON CAPITAL SEED FUND AND EXPERT WITH
SKOLKOVO FOUNDATION IT CLUSTER

“Between 2007 and 2012 the government and its development institutions for the market attempted most of all to lay a foundation for an innovations-based, socially-oriented economy, e.g. with venture investment. We can call this stage “market creation”.

The objective has been largely achieved. A support infrastructure for innovations and the main parts of an ecosystem are, for the most part, in place as of the beginning of 2013. But the created innovations sector is characterized by significant structural and systemic imbalances and bias. Thus, for the next few years correcting the market, removal of ineffective instruments and coordinating the work of practically useful ones become new goals. As a consequence, a number of development institutions must shift attention from “market creation” to “effective market development and correction”.

- The Russian economy bias and imbalances can be divided in two groups: *stage* and *sectoral*.
- The *stage* imbalance is an acute lack of capital for seed and pre-seed projects;
 - The *sectoral* imbalance is lack of capital for most of the priority industries, except IT, Internet and telecommunications.

There is also a problem of scale: Russian innovative products and services make up 11% to 15% of the country’s GDP, compared to 30 or more in developed countries.

The development institutions should respond with an active use of new financial and non-financial instruments, the latter being in many ways more effectual.

It appears that Russia must begin moving from laying a foundation, launching of an innovations sector to its quick development and balancing. The innovations market corrections, removal of bias and imbalances should make use of a balanced set of support instruments. It may require substantial change in development institutions’ efforts. This will prioritize extension of the Russian innovations market, its penetration in traditional industries, as well as quick and efficient implementation of plans and programs, and the state innovative social economy strategy in general.



ROMAN KOSYACHKOV,
DIRECTOR FOR STRATEGIC DEVELOPMENT, OAO RVC

from the experience of other countries, launching venture capital markets during the last 20-25 years, may be replaced (under unfavorable circumstances) by the downward correction of the market — both in terms of capital supply and the number of transactions. After this correction, a phase of the long-term and sustainable development may begin. The timing and mere likelihood of the correction stage to come may be affected by macroeconomic factors — both domestic and global.

Thus, the key objective of the further development of the venture capital investment infrastructure in the coming years will be not a general increase in the supply of capital in the market through instruments such as universal venture capital funds, but the creation of industry-oriented financial and non-financial instruments⁵.

“The year 2012 clearly showed that Russia’s venture capital market is becoming more mature and transparent, the report⁶ prepared by PwC in conjunction with RVC summarizes. — The investment focus is being gradually shifted from initial stages of project development over to later ones. In 2012, we recorded a reduction in the activity of investors at the ‘seed’ stage and a rapid growth at rounds B, C, D and E. We also had 12 successful withdrawals of investors. This means that the market is becoming more attractive for investors as it has big corporate players appearing therein and terminating venture capital investment cycle”.

Imbalance of the Russian Venture Capital Market.

Clear structural imbalances are being shaped in the market, and the rapid development of venture capital investments cannot conceal this fact from the experts. First, projects of the pre-seed and seed stages (the most risky in terms of investment) still feel the shortage of capital available. Second, a share of Internet projects among the recipients of investment is disproportionately high, especially in e-commerce.

“Pre-seed grants and investments that support start-ups at initial stages, remain a weak part of the Russian innovation system”, — a study by the Russian Public Opinion Research Center and RVC, published in February 2013⁷.

5 Adapted from PwC, RVC.

6 MoneyTree. Venture Market Navigator. Overview of Venture Capital Deal, Russia, 2012 // PwC and RVC. URL: http://www.rusventure.ru/ru/programm/analytics/docs/MoneyTree_RUS_2012_web.pdf (referral date -May 5, 2013).

7 Venture Capital Investment Market: Key Trends // Russian Public Opinion Research Center and RVC URL: http://www.rusventure.ru/ru/programm/analytics/docs/201302_vciom.pdf (referral date — May 5, 2013)

Russia is not unique in all this. Venture capital funds around the world are reviewing their investment strategy in favor of the companies that are at later stages of the life cycle, says the “Tenth Annual Report on the Situation and Trends in the Global Venture Capital Market” by Ernst & Young. Outside Russia, a share of investments in the companies that have already become profitable, has increased to

SUCCESS STORY

Aelita

INNOVATIVE PRODUCT

The Aelita anesthetic and breathing apparatus



INVESTORS

The Foundation for Assistance to Small Innovative Enterprises in Science and Technology, FASIE (RUB 6 million under the START Program), and RVC venture capital funds (RUB 30 million)

INVESTMENT OUTCOME

a unique device has entered the medical equipment market

Excessive concentrations of anesthetic agents are, unfortunately, rather frequent for patients after surgery. The design of anesthetic and breathing devices leave much to be desired and the associated imperfections negatively impact the patient, i.e. a sense of discomfort after waking up and the high financial costs of surgeries. Developers from Voronezh have created Aelita, a unique anesthetic and breathing apparatus to solve these problems.

“Thanks to the innovative injection technology that allows dosing anesthetic concentrations, the volume of the anesthetic agent exactly corresponds to the value set by the anesthesiologist and does not depend on a variety of uncontrollable factors specific to the traditional evaporation technology”, — explained Yury Karpitsky, CEO of Aelita. The injector operation is based on the principles of gas dynamics applied in rocket and missile engineering. And this is not by accident. The Aelita project was created by former engineers from OJSC Konstruktorskoye Byuro Khimavtomatiki, the leading company of ROSCOSMOS, Russian Federal Space Agency, engaged in the design of rocket engines. The innovative element can be also identified in the fact that the very same injector can handle all known types of anesthetics.

The competitors (devices similar to Aelita) employ the evaporation principle to measure the anesthetic agent. This principle has a number of

shortcomings: inaccurate dosage, high process inertia, and the need to use a separate evaporator for each type of anesthetic. The newly developed injection technology has turned out to be both more accurate and cheaper (by 30-50%) than modern evaporators, which are precision mechanical devices. Aelita is operated by a touch screen, and doctors have no problems with that. The device was tested for about a year (2011 to 2012). All documents issued by the Federal Healthcare Surveillance Service of the Russian Federation (Roszdravnadzor) have been obtained for using the equipment in medical practice.

Due to its participation in the START Program of the Foundation for Assistance to Small Innovative Enterprises in Science and Technology, FASIE (2010 to 2012), the company successfully attracted investors which injected RUB 6 million into the business. During the Program’s three phases, the technology was developed from scratch; the company created a test model and obtained all the necessary licences.

Aelita is a joint venture between the developers of the new technology (LLC KB Medsystem) and a group of investors, including two RVC venture capital funds. In 2012, the company received RUB 30 million from the funds.

The number of orders for supplying Aelita devices to Russian and foreign customers is increasing.

Experts' opinions

“In the last two-three years the support infrastructure for small and medium innovators has received a strong impulse. Many more resources are available. It is also important that public awareness of these resources has gone up: everyone knows they are there, and whether to apply for them or not is every businessman's decision.

I would point to two most important areas to focus on for the next period. One is education — training of personnel that knows how to make use of the infrastructure. The other is support for entrepreneurs that use what it offers on every development stage (auditing services, legal advice etc.).



IVAN NECHAYEV,
CEO, MEMBER OF THE BOARD OF DIRECTORS
AND CO-OWNER OF RUSSIAN NAVIGATION
TECHNOLOGIES

“Pouring large amounts of money and grants into an industry by itself does not always help innovations. Russia has plenty of innovators. Russian scientists can solve almost any problem. But, alas, they do not know what problems to solve. And it should be private business, not the government, telling them. Developed markets have two thirds of R&D funding from private funds or corporations. That the government manages the innovations market, its grants and other programs all show good intentions. But not always effective.



LAWRENCE WRIGHT,
DIRECTOR OF SKOLKOVO STARTUP ACADEMY

“State support programs often end up as more red tape for R&D.

This is true most of all for state-sponsored competitions and applying for grants. To get money, a start-up needs to write all sorts of reports, fill applications, then they take months to process and so on. This bureaucracy eats away at the time that could be creatively spent.



VIKTOR OSETRV,
FOUNDER OF REALSPEAKER

“The Russian venture investment market already has many dilettante investors. They are usually top managers of large corporations who create informal funds, or businessmen leaving their main field and interested in trying on the role of business angel or portfolio investor in a new sector. With the stock market less attractive and no clear trends in resource pricing, more “amateurs” may be coming to venture investments. For this reason I do not expect venture capital supply to decline in the next few years. But its quality may very well suffer, which in two-three years' time would take away from investors' payoff, and then, within three to five years, the market would cool. The cooldown scenario may be avoidable with continued creation of a venture infrastructure.



VLADISLAV KOCHETKOV,
PRESIDENT — CHAIRMAN OF THE MANAGEMENT BOARD OF FINAM INVESTMENT
HOLDING

“Russian venture funds are interested in more effective legislation. For example, the way limited partnerships work is right now not much more convenient than traditional forms like close share investment funds. Russian legislation should be similar to foreign. Real preferences for innovations companies are just as important.

We, being a venture fund, can say that Russia is short on good biotech projects. There are many problems with intellectual property rights. And any biotech project is expensive. A million dollars Internet seeds get is not enough here to evaluate the technology and the business model. Investors in biotech have to spend very large amounts of money at the early stages, but market value becomes clear really only after clinical studies.

The development institutions have done a lot for a comfortable environment in R&D. Now they need to focus on supporting fundamental science. Maybe copy best practices at leading colleges, like Moscow State University or Moscow Institute of Physics and Technology. Also I think that the government needs to perfect the grant system to stop personnel drain and interest young scientists in doing fundamental research in Russia.



YELENA KASIMOVA,
DIRECTOR FOR STRATEGIC DEVELOPMENT AND INVESTMENTS OF BIOPROCESS
CAPITAL PARTNERS

“Progress to an innovations-based economy has showed to our decision-makers the magnitude of the challenge before us. They are beginning to understand that pumping money is not enough. The government and development institutions are making good efforts in many directions, but I cannot say the situation has radically altered yet. The market is sluggish and conditions for a new phase are only shaping up.

There are increasing disproportions in quantity and quality between “advanced” market players, mostly in IT, and a mass of companies and investors in other sectors. The government and all of the parties should work for a more vigorous transfer of business and investment competences. The “innovations lift” should move not just money, but competences across the market — vertically and horizontally.



IGOR GLADKIKH,
DIRECTOR AND COORDINATOR OF RUSSIAN VENTURE FAIR

69% in the number of transactions (from 56% in the pre-crisis period of up to 2006) and to 74% in terms of investment size.

Establishing the RVC Seed Fund in 2009 and the Skolkovo Foundation in 2010 was an important step in the development of investment at initial stages. The startups of high risk, which at the same time require smaller volumes per company, need special treatment and attract a specific class of people — the so-called business angels. During its existence, the RVC Seed Fund has approved the financing of more than 60 innovative projects with a volume of the required Fund investments in excess of RUB 1.2 bn, of which 18 projects — in 2012. Regionally, the largest share of the Fund's investments is accounted for by Moscow, Tomsk and Nizhny Novgorod.

Yet it seems obvious that, in future, development institutions will be asked for more effort, since the situation with investments at initial stages largely determines the quality and quantity of projects at later stages.

DEVELOPMENT OF THE TANGIBLE INVESTMENT INFRASTRUCTURE

The synergy of infrastructural elements and effective management of facilities is the priority.

Following the results of Implementation Phase 1 of the Strategy, it can be said that almost all kinds of material and technical facilities, which are used in the world to support innovation, are now available in Russia also, and some — in an amount corresponding to the level of developed markets.

Individual elements of this infrastructure began to appear in Russia as early as the 1990s. By the time of the implementation of the Strategy, a number of federal centers for the collective use of scientific equipment had reached 63, with their cumulative resource base consisted of 2.1 million pieces of equipment worth more than RUB 15 bn (as of the year-end 2010). In 2005-2010, more than a hundred of technology transfer centers under universities and research institutions were established. The process gained momentum in 2010 with Decree of the RF Government No. 2195, according to which universities were involved in distributing money to create the innovations infrastructure (in total — RUB 9 bn for a term of three years, up to RUB 50 mn per educational institution yearly). As part of the support program for small- and medium-sized businesses, the country had 34 innovative business incubators established by 2010, with total expenditures of the federal budget amounted to RUB 863 mn. In addition, there were more than 140 technology innovation centers and science parks. Within the integrated program titled "Creating High-Tech Science Parks in the Russian Federation", the money for establishing eight science parks in seven constituent entities of the Russian Federation were allocated during a peri-

od of 2006 to 2010. It is scheduled to allocate money for establishing four science parks more until 2014. Special technology development economic zones have commenced their operations. The innovations infrastructure has been formed in almost every university.

Meanwhile, the innovation market participants had repeatedly questioned the effectiveness of using and managing the infrastructure created. In

SUCCESS STORY

Hepatera

INNOVATIVE PRODUCT

Myrcludex B, peptide, inhibitor of viral particle penetration into liver cells



INVESTORS

Maxwell Biotech Fund, created with the participation of RVC

INVESTMENT OUTCOME

Successful clinical trials are under way

LLC Hepatera was established in December 2011, with support from the Maxwell Biotech Closed-End Fund of Risky (Venture Capital) Investments. The company's main objective is to bring Myrcludex B, an innovative drug to treat chronic viral hepatitis B and D — diseases that currently cannot be completely cured, to the Russian market. The Myrcludex B product has been developed by a group of scientists applying a unique research method which allowed for a gradual study of the penetration of hepatitis B virus particles into hepatocytes. Myrcludex B is the only representative in a new class of molecules that block the penetration of hepatitis B and D into normal hepatocytes. The drug can strongly bind to specific receptors on the surface of hepatocytes, which prevents viral particles from penetrating inside cells and, consequently, prevents the spread of infection by creating a reserve of normal cells to restore liver tissues. This mechanism provides an opportunity to solve two of the most important medical problems, namely, the continued eradication of HBV and the prevention of HDV. The product's pre-clinical properties were evalu-

ated in a series of in vitro and in vivo experiments. Its use completely prevented HBV development in the model tested in vivo with transplanted hepatocytes susceptible to virus infections. Animal tests have been conducted to study the general toxicity, immunogenicity, efficacy, reproduction/developmental toxicity, and pharmacokinetics. In early 2012, a clinical study by Ia-Phase took place which demonstrated the safety and tolerability of the product. In August 2012, the Ministry of Health of the Russian Federation issued a permit allowing Hepatera to conduct clinical trials under the protocol "Open Randomized Trial for Daily Use of the Myrcludex B Product as Compared to Entecavir, When Treating the Patients with HBeAg-Negative Chronic Hepatitis B, Phase 1b-2a". By the beginning of 2013, Hepatera had opened five clinical centers specializing in the treatment of chronic viral hepatitis. As of now, 24 patients are receiving treatment under the clinical trial. The company is simultaneously preparing production instructions and selecting potential Myrcludex B manufacturers.

some cases, facilities completed with construction began to be used (in whole or in part) for other types of operations or ceased to function, due to insufficient funding and a lack of opportunities to become self-recoupment. On the one hand, this was due to the insufficient number of innovative technology companies that could feed the infrastructure. On the other — due to a total re-evaluation of the importance of “walls” (in the form of a preferential rent of office and industrial space in business incubators and science parks, and access to high-tech equipment, and so on) for the successful establishment and development of innovation projects. It has turned out that, at early stages, they are far more interested in enjoying “related” services and activities that allow interacting with other members of the innovation ecosystem: investors, experts and industry customers... The “soft” infrastructure to be created by the management of infrastructure facilities, sometimes is more important than the material one.

In connection therewith, the Strategy provides for the further development of innovations infrastructure, improving the efficiency of its management, as well as the monitoring of the use of budget funds by federal executive bodies. Among the main stated lines of the Strategy are the following:

- backing the spread of market models for the formation and development of innovations infrastructure facilities;
- providing additional support to the special technology development economic zones and better management of their establishment and functioning;
- providing additional support for science cities and other separate territorial entities with high research and innovation potential, and better management of their establishment and functioning;

- providing targeted support to improve the operations of the innovations infrastructure facilities.

Science parks in Russia are part of the integrated program “Creating High-Tech Science Parks in the Russian Federation”, approved by Decree of the RF Government of March 10, 2006 No. 328-p. In accordance therewith, a period of 2011 to 2014 will have science parks reaching their design capacity, with the creation of new parks by replicating the experience gained at previous stages of the program, and the formation on the basis of high-tech science parks of a single system, allowing for synergies to strengthen the competitiveness of resident companies.

Centers for collective use of scientific equipment (CCU) established under research and educational institutions are an important element of the advanced research infrastructure, which is formed in accordance with the federal target program “Research and Development in the Line of Priority of the RF Science & Technology Sector” for 2007 to 2013. As of April 30, 2013, Russia has 311 CCU with 9.1 million pieces of scientific equipment available (real time and integrated data are published here: Ckp-rf.ru).

During the Implementation Phase 1 of the Strategy, the innovations infrastructure of universities continued developing. Its support by the state is carried out on a competitive basis through selecting federal education programs for universities. The tender is open. Selected universities are allocated budget funds of up to RUB 50 mn early, for a period of 3 years, to implement the programs.

The Fund for Infrastructure and Educational Programs (FIEP), established in accordance with Federal Law No. 211 “On the Reorganization of the Russian Corporation of Nanotechnologies”, continues implementing the program on establishing nanocenters. Their main aim is to provide full-cycle startup development services in the field of nanotechnology, including financial investments and the provision of complex technological equipment. Each nanocenter has its own area of expertise, determining the selection of “package” projects. Centers of innovation, including being at an early stage of development, can join the above centers as residents thereof.

In a period from 2009 to 2011, four open competitions aimed at selecting projects for establishing nanotechnology centers in the Russian regions were held. Following their results, 12 projects for establishing nanotechnology centers have been approved: in Moscow, Zelenograd, Dubna, Troitsk, Kazan, Ulyanovsk, Saransk, St. Petersburg, Yekaterinburg, Stavropol, Novosibirsk and Tomsk. In 2012, sales of nanotechnology centers totaled RUB 365 mn. At present, the boards of directors of nanocenters have 48 startups approved for funding.

The year 2012 saw the opening of the first nanocenter in Kazan, which incorporates X-ray, mass spectrometry, and spectrophotometry, thermal

EXPERT OPINION

“The Russian infrastructure for R&D currently can digest only IT projects. There is a felt shortage of “long money” for technological or medical start-ups. Moscow State University Science Park’s Success Formula program works quite well, their business incubator is extremely helpful. So is FASIE’s START. But more transparent evaluations would be welcome, perhaps with all expert reviews in open access or at least available on request. Skolkovo residency works. The tax benefits are noticeable, but it would be good to relieve the innovations companies of wage taxes completely, keeping the profit tax.

For technological start-ups, especially for biotech, customs are a constant pain. A Russian biotech project practically has no chance of competing because of the long holding times for substances and limits on biomaterials and cell cultures that can be imported. This should have been resolved a long time ago.

Support of winners of well-known competitions for start-ups is also important — BIT, HSE13K, Zwoykin Award, Technovation Cup, Russian Innovation Competition... Right now, winning does not come with any kind of support, and that should be changed.



ANDREY AFANASYEV,
FOUNDER OF DENDRIVAX

analysis, chromatography laboratories and those of physical methods of analysis.

9 nanocenters are scheduled for launching in 2013.

Since 2011, the FIEP has been implementing a program to create technological engineering companies (TEC). Their main task is to develop technologies, equipment and (or) products to third-party orders, based on the in-house technology base. Unlike production-oriented projects, focusing on the production and sale of the final unified product in the mass-market, technology engineering companies develop process solutions for specific customers. Drafting the design documentation for manufacturing and the industrial design of process equipment and systems that are required for process solutions implementation, experimental and control batches, etc. are among the outcomes expected from TEC operations. In 2011-2012, the Foundation held two open tenders to select projects for establishing technological engineering

companies. Three projects were selected — one in Troitsk and two in Moscow. Two more tenders are scheduled for 2013.

In addition, the Fund for Infrastructure and Educational Programs is implementing a number of other infrastructure projects. These include the Technology Transfer Center of RAS and RUSNANO, involved in the search for projects in the RAS institutions, Sarov Science Park and Penza Center for technology commercialization.

One of the objectives that are clearly stated in the Strategy for Innovative Development of the Russian Federation for the period until the year 2020, is a gradual transfer of the innovations infrastructure to market-based principles (including the possibility of privatization at some stages), given that it retains its innovation-backing function. Individual facilities of the innovations infrastructure (unfortunately, not a lot of them for the time being) now demonstrate self-recoupment and even profitability.

Experts' recommendations

Expert interviews of the RF innovation market participants have identified a number of suggestions and recommendations to intensify the implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 in the "Innovations Infrastructure" line.

1. Shaping additional development tools of professional competence and optimizing those available for the market participants at the earliest stages of commercialization and technology transfer (at the initial steps from science to business).
2. Establishing new communication platforms to couple scientists and inventors with the business and developing the existing ones.
3. Speedier competence transfers, both vertical, from investors and late-stage companies to early-stage companies, and horizontal, e. g. between tech developers in different industries. The "innovations lift" needs to spread competences across the entire market.
4. Reducing "red tape" and time expenditures of innovators applying for the support instruments offered by the development institutions.
5. Further promoting the development of the "buyer's market" of innovative companies.
6. More intense establishment and operation of industry-specific venture capital funds.
7. Reducing regulatory (administrative, control) burden of development institutions in order to increase the reaction rate and the effectiveness of their activities aimed at supporting innovation-driven businesses.
8. Developing an infrastructure for access of the innovations market participants to long-term money (especially in the biotech segment).
9. Fostering the creation of large-scale incubators, capable of acting as powerful centers to attract business innovations.
10. Promoting the improved quality of the investment (including venture) capital, boosting proposals of 'smart money' in the market.
11. Greater efficiency of the innovations market "pipeline", harmonizing entry and exit project flows.
12. Further efforts to tech entrepreneurs business innovation basics.
13. Facilitating the availability of investment at initial stages of innovation projects development.
14. Better work of creating new and improving the effectiveness of existing corporate venture capital funds, including state-owned ones.
15. Significant nation-wide expansion of the grant system for start-ups.
16. Further promotion of the development of "package" companies as the most important elements of the market innovation ecosystem.
17. Promoting globalization of the Russian innovations segment, including support of international cooperation and Russian companies entering foreign markets.
18. Optimizing the tools used to support innovations and increasing the consistency level of their application.
19. Development institutions must use a balanced set of financial and other support instruments in monitoring the innovations market.

Involvement in global innovation

Russian high-tech companies' contribution towards global value chains

“If you criticize what someone else does, suggest something instead. Having suggested, do it!”

*S.P. Korolev,
pioneer of practical astronautics*



Strategy

Creating an innovations-based economy requires removing obstacles to Russian high technology products' exit to external markets, global competition for Russian companies, practical adoption of R&D and manufacture of innovative products. Russian intends to participate in business projects and use diplomatic means to cooperate closely with technological leaders.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020

Other nations' experience shows that a modern economy with powerful R&D can free itself from the last century's linear logic that whichever country can amass production facilities and cut expenses the lowest will become world leader in that industry. In the industry of modern high technology there are many instances of leaders' not having any manufacturing assets of their own, choosing instead to outsource production or selling licenses for their know-hows. Intellectual properties and patented R&D become central to business and give them a competitive edge, with effective marketing also needed. It is commerce of this sort that often creates the largest added value in modern economics. The new arrangement requires nations and ambitious individual players to reconsider their ways of participating in the global division of labour and choose where to join in value-adding chains.

SUPPORT FOR RUSSIAN HIGH TECHNOLOGY EXPORTS

The global economy and Russian R&D.

Russian high technology sector has had few global successes so far. According to the World Bank, R&D products made up 8% of Russian industrial exports in 2011 (latest data). In BRIC, only India's percentage was smaller — 7%. China's was 26%.

Our country is also poorly represented in UN's Top-1000 list of companies across the world with the largest R&D budgets. In 2011 only four domestic companies were listed: Gazprom with 643 million euros, Rosneft with 205, Lukoil with 108 and FGC with 63 million. The ratio of their spendings on innovations to revenue is negligible, while for the top 100 companies in the list it averages 10%.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020 intends to support exports with the following measures:

- more active political and diplomatic support of projects for modernizing Russian economy;
- creation of mechanisms for exit to foreign markets;
- integrating the support infrastructure for innovations exports and other instruments for foreign trade with the regional support infrastructure for small and medium-size business;
- simplified customs procedures and removal of other hurdles to high-technology exports.

In the last decade, R&D has been quickly taking on features of a global industry, resulting in a very different structure of international competition from 15-20 years ago. State program Development of Science and Technology 2013-2020 (approved by Government decree 2433-p of 20 December 2012), discusses the situation in detail. "Import substitution with complete value-adding chains entirely within a national economy has become significantly harder", the document reads. "Expenses and risks associated with achieving technological breakthroughs are so great that partnerships and alliances between nations and companies are

quickly forming to consolidate efforts in particular venues. Companies outside of global chains have correspondingly weaker competitive advantages. The time needed for implementation and wide application of new technologies has decreased noticeably. The speed with which new technologies

According to findings by Dow Jones VentureSource, Russia entered the European

top-five

in terms of venture capital investments in high-tech industries by year-end 2012.

This Russian business is on the global top-1000 list of companies with the largest R&D budgets.

Among the global top-1000 companies with the largest R&D budgets, Russia is still represented by mining and infrastructure businesses. The ratio of their innovation expenditures to earnings is negligible (while for companies in the Top 100 it averages 10%).

2008 RATINGS

#108 Gazprom
R&D costs — 0.6% of earnings

#758 AvtoVAZ
R&D costs — 0.8% of earnings

SITRONICS
R&D costs — 2.6% of earnings

2011 RATINGS

#158 Gazprom
R&D costs — 0.6% of earnings

#383 Rosneft
R&D costs — 0.3% of earnings

#640 LUKOIL
R&D costs — 0.1% of earnings

#959 Federal Grid
Company
R&D costs — 1.9% of earnings

Source: OECD

Experts' opinions

“How attractive is the Russian R&D market to foreign investors? Russia is among the world's largest economies. Its GDP is already over \$2.5 trillion, and growth lately has on average reached 4% a year. It is a healthy, financially balanced economy with national debt within 8% of the GDP and per capita GDP over \$18,000 — the highest in among BRICS countries. Russia with its 145 million of educated citizens and a burgeoning economy is too significant a country not to be interested to the entire world as a source of innovations. A question, then: when and in what measure can we expect more active foreign investments? I think it is important to clarify a few aspects here. First of all, the question of how attractive Russian innovations are. I can say definitely — very attractive.



RUSLAN ALIKHANOV,
PARTNER OF MCKINSEY & COMPANY

“High technologies will never amount to a large percentage of Russian exports if we continue to finance and breed copycat projects. An innovations infrastructure cannot develop effectively under such a policy. We must support genuinely new technologies. The current model already makes itself felt: the R&D industry is oversaturated with funding, but quantity of projects does not become quality. What can be done? First, study carefully the Presidential list of economic priorities and concentrate on them. Second, change accents in the business education system. Business schools should teach doing three skills: 1) doing only what you do better than anyone, 2) doing what you like and can do, 3) doing what earns money. I would add to this last one that it must make money globally. And the first I would correct this way: “better than anyone else in the world”.



GENADY MEDETSKY,
EXECUTIVE DIRECTOR OF SYNERGIYA INNOVATSII
VENTURE CAPITAL FUND

“Russian companies, just like foreign companies, differ with respect to their capacity to change business strategies after new technological and market trends. For example, most IT companies find it obvious that the speed of their reaction to such changes in many ways determines their commercial success. But different organizations have very dissimilar opinions on acceptable risks when investing in new technologies today's business need to react quickly. There are three basic types we can call pioneers, realists and skeptics. Pioneers, according to statistics, invest in R&D more than two times of what realists spend and almost four times of what skeptics do. These being untested, unproven technologies, the risks are distributed accordingly.



As a result, improving a business' reaction speed is expensive and dangerous. If a company wants to go from a skeptic to a realist, it will have to increase its IT budget by 160% and its IT personnel by 20-50%. This is why in the United States, for example, there are only 16% of pioneers, with five times as many realists — 74%. Only 10% of companies are skeptics, because few Americans are willing to sacrifice the main competitive advantage to security.

In Russia, according to LINEX, the figures for IT are different. On average we have half the number of pioneers — 7%, and over twice the number of skeptics — 25%. Realists are fewer than in the US — 68%. The reasons have to do with a different context information technologies are introduced to: IT's role in companies' production and services, stability of market environment, management structure, level of competition and geographic scale of business. All these go into the “IT expenditures context” index.

Obviously, different industries in the Russian economy have different indices. The best figures are in the IT sector, telecom and the media. There are even more pioneers here than in the US, and correspondingly fewer skeptics. This is why the industries' response to any changes in business conditions is so rapid. Unfortunately, that does not always help. It does not help when they work under the b2b model with companies from skeptic-heavy industries. If skeptics' business in Russia depends on response speed at all, it is response to non-market competition factors. There technologies are powerless.

SERGEY KARELOV,
COMMITTEE CHAIRMAN OF THE LEAGUE OF INDEPENDENT IT EXPERTS (LINEX)

“Russia's intellectual property protections are being perfected and improved thanks to active efforts of the Russian Agency for Patents and Trademarks, patent attorneys, arbitrage court and the recently created Court for Intellectual Rights. The resulting system is favorable to knowledge-intensive business, because innovators can expect copyright protection from the state and may develop their know-how towards eventual security of a patent. It should be perfected with a wider use of the specialized Court. Also courts in general should impose heavier compensations for rights violations, patent protections for software should be introduced, trademarks should be possible to register as joint property, there should be another series of TV broadcasts about innovators and inventions, innovators should receive significant incentives, technoparks, incubators and companies implementing innovations in their production — fiscal remissions.



BORIS VYGODIN,
PATENT ATTORNEY OF THE RUSSIAN FEDERATION, PATENT ATTORNEY OF THE
EURASIAN PATENT ORGANIZATION, INSTRUCTOR IN COPYRIGHT PROTECTION AT THE
DEPARTMENT OF INNOVATIONS BUSINESS OF THE RUSSIAN PRESIDENTIAL ACADEMY
OF NATIONAL ECONOMY AND PUBLIC ADMINISTRATION, CEO OF VYGODIN AND
PARTNERS PATENT BUREAU

are assumed in an economy practically determines its competitive standing. To the public and economically, long transfer times from fundamental research to practice make science that much less valuable. The world economy is quickly taking on a new model of approximating science with technology. The new global “technological wave” may change radically high technology goods and services markets and have profound influence on the traditional competitive advantages of the Russian economy, competitive ability of particular sectors... Russian companies are feeling increasing pressure from rivals with higher quality and more innovative products and services. Lowering prices as a response is becoming less and less viable, while changing to modern product is growing in importance. Under increasing global pressure Russian companies have begun to show much more interest in innovative technologies. These are most often foreign-made solutions, the demand still poorly answered by the domestic R&D sector”.

Exit to Market and Exports Support Roadmap

Late in 2011 the Strategic Initiative Agency began to implement, on orders from the Chairman of the Government, a National Business Initiative for Better Investment Climate. It includes 22 projects suggested by market players to make commercial operations in the country simpler and cheaper. One of them is an Exit to Market and Exports Support Roadmap, approved by Government decree 1128-p on 29 June 2012.

This projects aims to help Russian non-resource exports to markets, aid their penetration and establishment there to diversify exports and increase their contribution to modernizing the economy and stable growth.

Implementing the roadmap would allow:

- double the number of exporters by 2018;
- expand the volume of non-resource exports significantly, including innovations;
- counteract the tendency to lowering share of advanced goods in exports;
- diversify exports to a level comparable to that of

- other nations — traditional resource suppliers;
- create favorable conditions for an emergence of numerous, competitive, active entrepreneurs in exports, e.g. small and medium-size companies, which would benefit domestic competition and business environment.

The Ministries of Economic Development, Finance and Foreign Affairs, Federal Customs Service, Federal Service for Fiscal Monitoring, Federal Tax Service and other offices are

Share of high-tech products in manufactured goods exports, %

Country	2008	2009	2010	2011
Russia	6	9	9	8
Brazil	12	13	11	10
India	7	9	7	7
China	26	28	28	26
U.S.A.	26	21	20	18
Germany	13	15	15	15
Japan	17	19	18	17

Source: IBRD

Representation of the BRIC countries among the Top-1000 companies with the largest R&D budgets, 2011:

Russia 4 companies
Brazil 5
India 6
China 33

(data by OECD)

Experts' opinions

“R&D start-uppers are people that make up a very active and competent part of our society. And we want that part to be as mobile as possible; mobility and activity go hand in hand. Innovations companies need to be global. Talking about a start-up migration from Russia is not quite right. This is the best portion of our population rising to action. Mobility, hard work, new relationships and new markets, transfer of our culture — these tasks are related to creating an innovations ecosystem. The expression “start-up leak” is somebody’s invention for I don’t know what purpose. Talking about an outflow of capital, we understand that at the same time investments are coming in our economy. It is the same with R&D businesses — there is an in- and an outflow. And the outflow is stronger than the inflow for now. But very many entrepreneurs, having acquired knowledge and experience in other countries, come back to Russia. Russian R&D investors now include many successful businessmen who have returned to the country. So we should not be afraid of a “start-up leak”.



OLEG ALEXEYEV,
VP OF SKOLKOVO FOUNDATION

“Russia’s strong positions in technologies and engineering education steadily contribute to the development of entrepreneurship in the country. Over the past years, an increasing number of technological startups has been observed in such fields as IT, education, healthcare, energy, etc... Many Russian startups offer technologies and solutions that are unique not only to Russia, but also to many countries worldwide.



Cisco’s innovation strategy consists in supporting innovators in different forms, all over the world and in Russia. Thus, we have already invested into many Russian projects both directly (for example, into such companies as Ozon and Parallels) and by the means of the venture fund Almaz Capital Partners that was established with our support. Over the past years, the fund has invested into a few startups in IT, media, and telecommunications, including three Skolkovo residents (Jelastic, Parallels, AlterGeo). In the future, we are going to foster our initiatives in this sphere.

Since the first MOU with Skolkovo was signed in 2010, Cisco has been progressively delivering on all commitments. We have created Cisco Innovation Center, a platform for our first R&D team in Russia, and the Experience Center, cutting edge technology showcase; developed Smart City and Virtual Skolkovo concepts; we provide grants to startups through Cisco-PRIZE contest and drive various educational projects. Cisco intends to further expand its initiatives in Skolkovo as we believe in the potential of Russia and aim to support Russian innovation and modernization agenda.

PAVEL BETSIS,
CISCO MANAGING DIRECTOR FOR RUSSIA AND CIS

“Everywhere in the world international IT corporations in general and Microsoft in particular are playing an important part for developing innovations in several key directions and helping local R&D ecosystems.



First of all, a company’s incubating innovations in its globally spread R&D centers creates new workplaces for trained specialists.

Secondly, for their business to grow companies need to develop local markets and invest largely in them. For example, Microsoft actively supports the Russian innovations ecosystem in a number of ways, from the technological competition for young inventors Imagine Cup, the BizSpark program and Microsoft’s Seed Fund, which has allowed thousands of Russian startups to improve their competences and obtain important business advantages to targeted support programs for the most promising start-ups and assistance with global exit. Such start-ups become a part of Microsoft’s partnership net and become high-technology initiatives the Russian economy needs for modernization. According to an IDC study, in 2009 for every rouble Microsoft made in Russia companies in local ecosystems made 9.85.

Third, corporation acquire local R&D companies and become “world superconductors” for new technologies. They help innovative ideas become products for billions and facilitate cultural and business sharing among entrepreneurs, shaping a new class of businessmen with an extremely broad outlook. It is these who create intellectual capital for Russia’s future.

NIKOLAI PRYANISHNIKOV,
PRESIDENT OF MICROSOFT RUS

“The economy has long since globalized. And any country now is interested in having its developers’ products sold everywhere on the planet, generating a cash flow back. This is why the government needs to support domestic R&D companies.



There are other ways for innovations to grow, as well. For example, when Russian developers work at R&D centers of international corporations in the country. This employment means new workplace, good salaries for Russian citizens and taxes for the budget. It also means intellectual property, staying in the country as expertise and knowledge. People who have worked in such a corporation can leave anytime and found their own business. In this way international corporations allow Russian developers to gain experience and understanding of the global market so needed in Russia.

They are also seriously interested in developing the Russian market, because here, too, they and their partners sell their products. And the more companies become loyal to a platform’s creator, the more products will appear based on it. Not only the corporation but its Russian developers, integration specialists etc. will benefit from higher incomes. For instance, for every dollar Microsoft earns in Russia its partners in the country earn 9. This is a symbiosis.

SERGEY YEREMIN,
HEAD OF MICROSOFT SEED FUND IN RUSSIA AND THE CIS

responsible for the project's implementation. Most of the measures are planned for 2013-2015. The Government-approved schedule includes the following steps:

- create a nation-wide system of exports support;
- simplify and expedite administrative and customs processing for exports;
- widen the range and improve the availability of financial services for exporters;
- develop informational resources and an informational environment for exports;
- create a regional infrastructure to support small and medium-size companies and beginning exporters;
- introduce institutes and measures to popularize exports;
- direct commercial missions to exports promotion;
- improve conditions for exit to markets;
- encourage self-organization among exports.

Export Insurance

Agency of Russia

An Export Insurance Agency of Russia (EXIAR) was founded in 2011. Its main purpose is to support Russian exports and investments, insuring export loans against commercial and political risks. It also hedges Russian investments abroad against political risks.

Owned by Vnesheconombank, EXIAR's charter capital is 30 billion roubles. Its clients are mainly Russian exporting companies, including small and medium-size business, as well as Russian and foreign banks that finance exporters.

The plan for the Agency's development in 2012-2014 sets the following objectives:

- 9.7% of all non-resource exports Agency-insured;
- total volume of insured credit — 500 billion roubles;
- over 3,000 exporters covered.

For EXIAR's insurance of exports Asia, the CIS and Latin America are the most important regions. Its priority industries include engineering, aviation, motor vehicle manufacturing, ship-building, energy, space and chemical.

Since the Agency's establishment its legal and

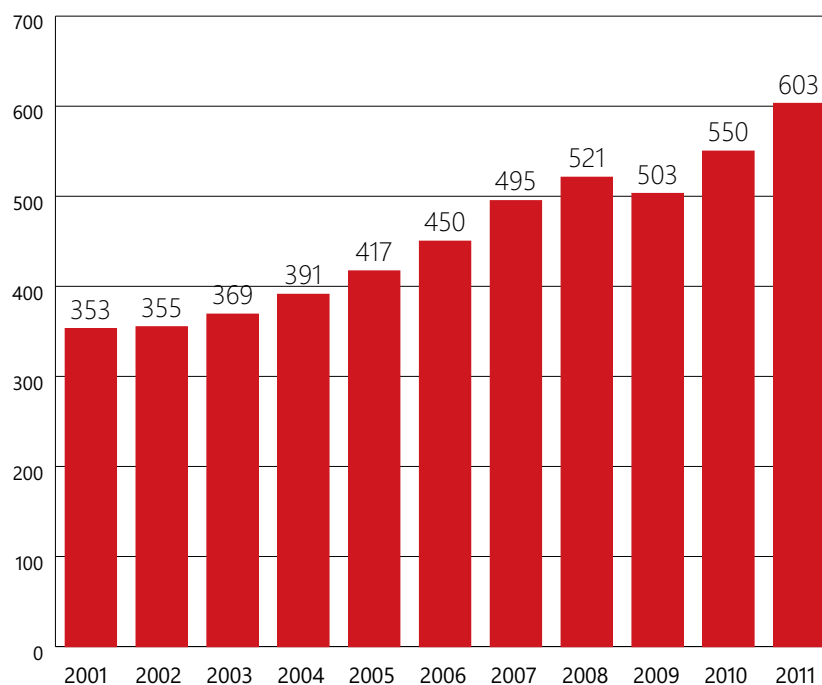
Targets of the "Supporting Access to Foreign Markets and Export Transactions" roadmap

% (the level of 2011 = 100%)

Indicator	2012	2015	2018
Growth rate in the number of exporters	105	130	200
Growth rate in the value of non-resource exports	106	135	210

Source: Agency for Strategic Initiatives (ASI)

Total R&D Spending by the Top-1000 Global Companies, USD billion

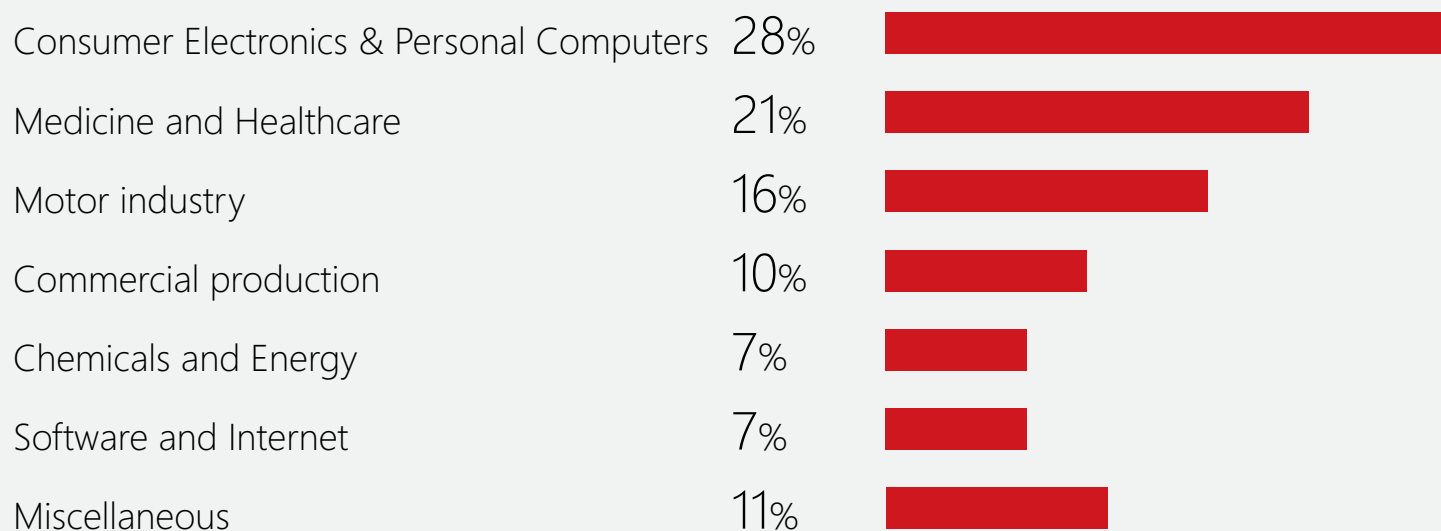


Source: Booz & Co

more than **USD 600** billion

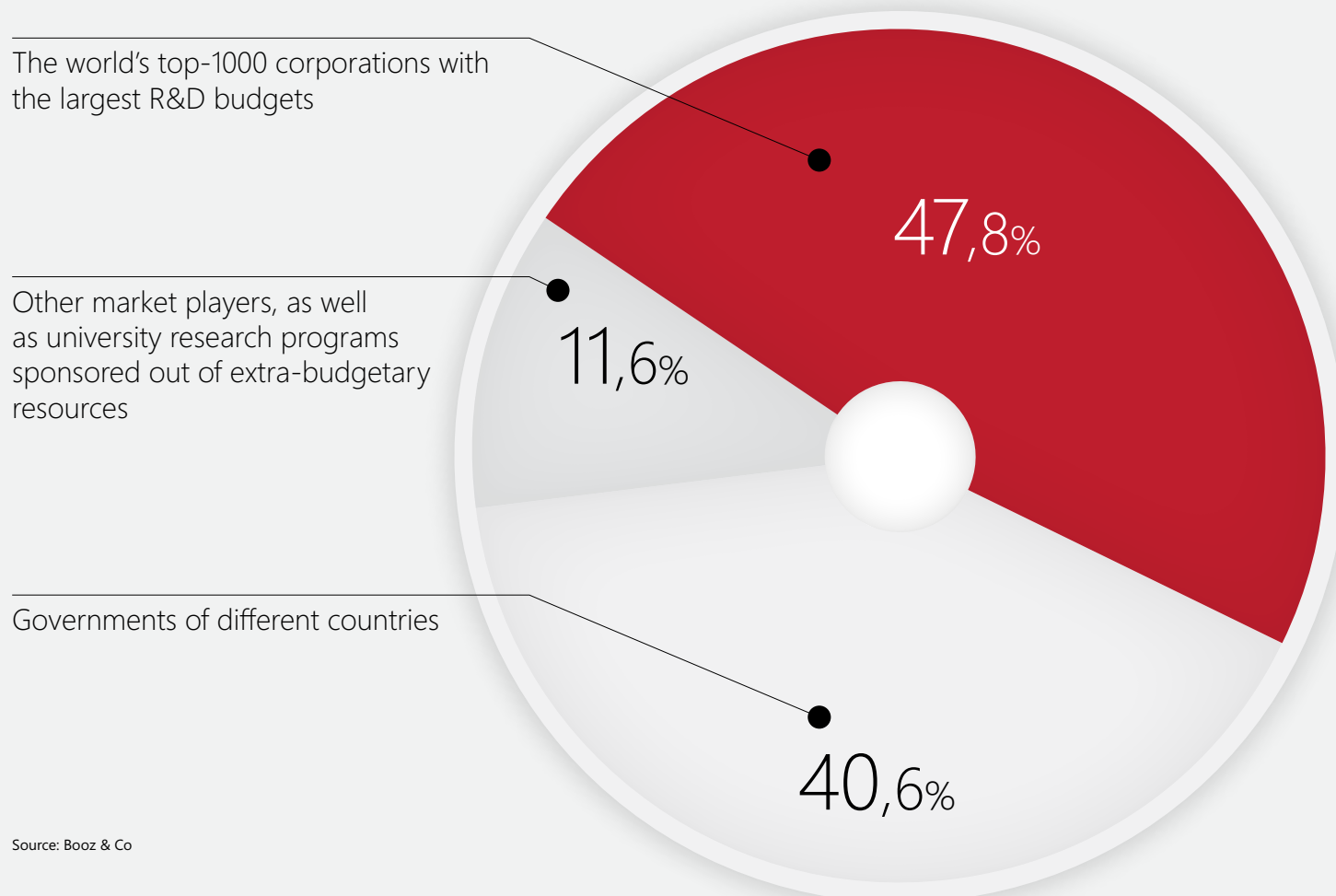
the top-1000 global companies spent for R&D in 2011. The average annual growth of R&D budgets over the past ten years is about 6%.

Global R&D Costs, by Industry



Source: Bloomberg

Distribution of Global R&D Spending



Source: Booz & Co

procedural structure has been clarified, insurance options developed, necessary corrections in the Central Bank's governing documents approved. EXIAR has begun supporting exports. In 2012 the government provided EXIAR with 10 billion dollars of security for 20 years.

In 2012 EXIAR insured 15 exports projects totaling 14 billion roubles — to Europe (Spain), Latin America (Cuba, Columbia), Asia (Vietnam, India, China) and the former USSR (Abkhazia, Ukraine, Belarus).

System development objectives for 2013:

- development of insurance products and start of protection of Russian investments abroad against political risks;
- together with commercial banks, creation of special solutions for exports-oriented small and medium business;
- statutory amendments for the Bank of Russia to put EXIAR-insured loans under the Bank's co-financing umbrella;
- creation and application of commercial banks' programs to finance exports contracts insured by the Agency.

Improving Russian commercial missions.

One of the initiatives in carrying out the Strategy and the Roadmap is to elaborate in strict detail operation of Russian commercial missions so as to support exports, especially of innovations. Order No. 540 of 29 August 2012 by the Ministry of Economic Development approved a program of organizing and monitoring meetings between Russian companies and research bodies with potential partners. This program determines the ways and means of missions' operations. The Ministry has also drafted a Repositioning for Commercial Missions 2012-2016 conception, with steps towards a more effective system, promoting national economic interests. At the same time work is being done, with participation from the Russian Foreign Trade Academy, to refine the system of performance indicators for commercial missions, reflecting the project-based exports promotion.

SUCCESS STORY

LLC Gazokhim Techno

INNOVATIVE PRODUCT

supply and operation of plants refining hydrocarbon gas into synthetic products



INVESTORS

Private investors (USD 14 million), the target grant of Skolkovo (RUB 150 million)

INVESTMENT OUTCOME

construction of a small-sized plant for refining gas into synthetic crude oil; signing agreements with major partners inside and outside of Russia

The line of business of Gazokhim Techno, established in 2011 and being a Skolkovo resident, is the supply and operation of plants which refine hydrocarbon gas into synthetic products. The main idea is to refine flare gas into synthetic oil, which can be easily mixed with crude oil without any extra costs and can be delivered via the existing pipeline system. The point of this innovative project is to achieve synergies in combining a synthetic gas regeneration plant, employing the catalytic partial oxidation technology and a microchannel Fischer-Tropsch reactor with an integrated catalyst. The project aims at a considerable CAPEX reduction, which will allow for the cost-effective refining of associated gas, and the perspective commissioning of small-sized gas fields, which are even not being developed at the moment. The small size of the plant under development will allow using it at remote wells and in the course of offshore production. The main advantages of the innovative technology created by Gazokhim Techno:

- no further gas flaring;
- possibility of mixing synthetic oil with crude one for the delivery via the existing oil pipelines;
- 3-5% increase in oil production at the fields, equipped with the plant, by adding synthetic crude oil;
- compact size and relative ease of installation, allowing its use in remote fields and during offshore production;

- additional revenue from the sale of CO₂ ERUs (Kyoto Protocol).

ALLTECH Group has signed a package of documents on joining the Project of 'mini-GTL' (a small-sized plant for refining gas into synthetic crude oil). The partner undertakes to provide the best part of funding, as well as to conduct a key business-building expertise in the field of oil and gas, chemical utilization of natural gas, innovation marketing and management. The construction of the first plant has already been initiated, and a number of small- and medium-sized independent oil and gas market participants have expressed their interest in having the plant.

"Mini-GTL" is a joint project of Gazokhim Techno and the Oxford Catalysts Group PLC, the global leader in the field of small-tonnage Fischer — Tropsch synthesis and microchannel technology, entered into an agreement with the company on joint operations in Russia and the CIS countries.

The total investments required by Gazokhim Techno for the project implementation is estimated at a level of USD 19 mn, of which USD 14 mn will be accounted for by private investors.

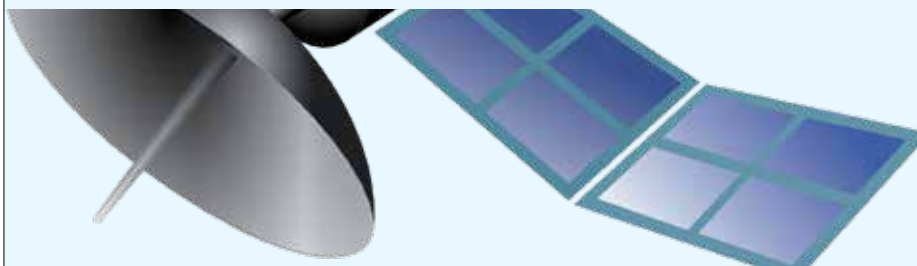
The target grant of the Skolkovo Foundation in an amount of RUB 150 mn for the construction of a pilot "mini-GTL" model at one of the oil and gas fields appears to be an effective complement to private investments.

SUCCESS STORY

Dauria Aerospace

INNOVATIVE PRODUCT

unified platform for the creation, launch and operation of small satellites



INVESTORS

The company has become a Skolkovo resident

INVESTMENT OUTCOME

Winning the tender by Roscosmos to create nanosatellites for a total of RUB 315 mn

Dauria Aerospace, resident of the Skolkovo Center for Innovations, is an innovative private Russian company engaged in the development and manufacture of satellites. The project is mainly focused on extending the scope of application of artificial Earth satellites in the economy due to their cheapening and through reducing their development time. "I want to focus on space projects, — Michael Kokorich, founder of Dauria Aerospace, is quoted as saying in his interview to RBC Daily. — That's my personal medium-term challenge. I'm going to allocate the funds from my previous businesses, most of which are associated with the retail sector (both from Tehnosila and Yuterra), to Dauria Aerospace".

The goals declared by Dauria Aerospace, namely, developing a unified platform for small-sized satellites with the involvement of foreign private companies, fulfilling the complete cycle of development, startup, automated management procedures and distributing services of satellite vehicle, designed for a wide range of telecommunications tasks, remote sensing and scientific research in the outer space. In addition, the company's activities shall contribute to the development of a system of regular budgeted cluster launches and control over satellites, as well as it shall encourage the development of the space industry in the mode of the public-private partnership.

When implementing the project, Dauria Aerospace is using the most advanced international experience in building up private companies that operate in the "private space" market,

attracting the best cross-disciplinary professionals with the long-term expertise in designing small-sized satellites from Russia, Europe, America, applying the integrated approach to the use of domestic and international standards and pilot projects.

The implementation of the project is to allow for the double-quick production of low-cost satellites in the near future through creating the conditions for the early introduction of the Russian competitive developments in the field of space device engineering and globally sought-after space vehicles, and it will also allow increasing the number and variety of the Russian space missions while reducing the budget of each such mission and the financial risks associated with the start-up and implementation phases of the programs.

Dauria Aerospace is actively developing a mutually beneficial cooperation with European and US private space companies, which allows for the quick adoption and use of the latest industry developments. In particular, it has signed a strategic partnership agreement with Surrey Satellite Technologies. As part of the agreement, the companies are planning to jointly develop a range of projects aimed at creating a cluster of small-sized satellites for the remote sensing, providing communications and solving scientific problems. Such an interaction is expected to apply the latest western developments to produce satellites in Russia, as well as to promote the domestic technologies in the global market.

In 2012, Dauria Aerospace, won the Roscosmos tender for the creation of nanosatellites for a total of RUB 315 mn.

ATTRACTING FOREIGN HIGH TECHNOLOGY MANUFACTURERS AND RESEARCH CENTERS

Innovation territories as gravity centers for R&D of global leaders.

Russia's scientific and engineering potential has always attracted important players. Intel and Boeing were among the first to make use of Russian specialists for R&D in 1993, opening R&D centers in the country. From late 2000s Russian Development institutions have been making concerted efforts for international cooperation in R&D.

In 2011-2012 the non-profit Foundation for Development of Innovation and Commercialization Center signed an agreement to host in Skolkovo research departments for SAP, IBM, Intel, Siemens, GE, EMC, Honeywell, Nokia, NSN, Ericsson, EADS, Cisco and others.

EXPERT OPINION

“The innovations environment has changed significantly in the last two years. "Innovations" now means more than following the government's decrees, it means readiness for business.



Private laboratories and shared use centers with expensive equipment are opening. That shows: R&D is in demand! And our company is one of the consumers of the young Russian innovations infrastructure's products.

We make use of the Skolkovo technopark, work with their Intellectual Property Center, visit RVC's events. Recently we received a fairly high index as an investment target, according to RVC's Russian Startup Index. It is a serious argument on our side when we sit at bargaining tables with investors. We are also applying for Skolkovo residency, not because it is fashionable but because of the tax incentives. I myself consider the benefits my company gets as a kind of trade-off: today I feel warm and comfortable staying at home, and in a couple of years I am going to start making large deductions for the Russian budget and on my product it will say "Made in Russia".

VALERY PONOMAREV,
FOUNDER AND CEO OF WAYRAY

To draw foreign R&D centers to innovations territories other than Skolkovo, the Ministry of Economic Development has drafted a law that would make some of the financial incentives from the 28 September 2010 Federal Law on Skolkovo Innovation Center, applicable to organizations at science towns, limited access municipalities and certain cities from a list now under Government review.

Companies in innovation territories that sign cooperation agreements with the management company would become associated members of the Skolkovo project.

Their compulsory deductions to off-budget funds (the Pension Fund of the Russian Federation, the Social Insurance Fund, the Statutory Health Insurance Fund and local others) would be smaller than the normal values from Federal law dated 24 July 2009 No. 212 on Pension, Social Insurance and Health Insurance Fund Deductions. The associated members would receive no other benefits.

EXPERT OPINION

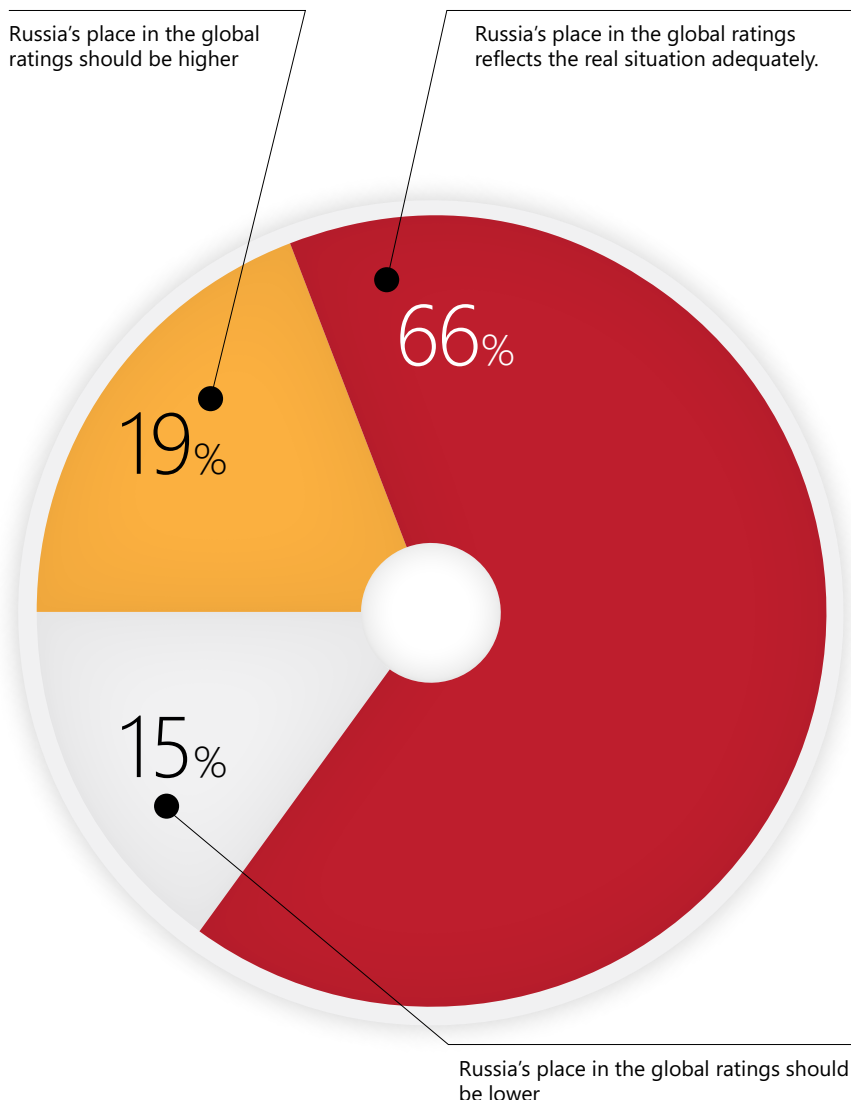
“Russian customs legislation remains a serious barrier to both increasing Russian companies’ scale for a global expansion and to research using imported equipment. Russia’s entry in the WTO has made patents more expensive. But these are not critical flaws. In practice Russian innovators are still much more interested in foreign patents, and they cost far more. The problem of engineers’ quality and quantity remains. There is a deficit of managers who can promote and sell a product. Some positive changes are noticeable, but there are no significant results.



The government needs to be as small as it can on the innovations market. It needs to create conditions for cheap record keeping and fight corruption. It is important for the authorities to give companies more freedom in connecting internationally and exiting to markets. The measures to establish a visa-free arrangement with Europe and the US are certainly very important. Customs procedures must be fundamentally simplified, because they are an obvious barrier to Russian integration into global R&D system.

ALEXEY ODINOKOV,
CEO OF NAUTECH AND PROJECT MANAGER
OF LEARNIP

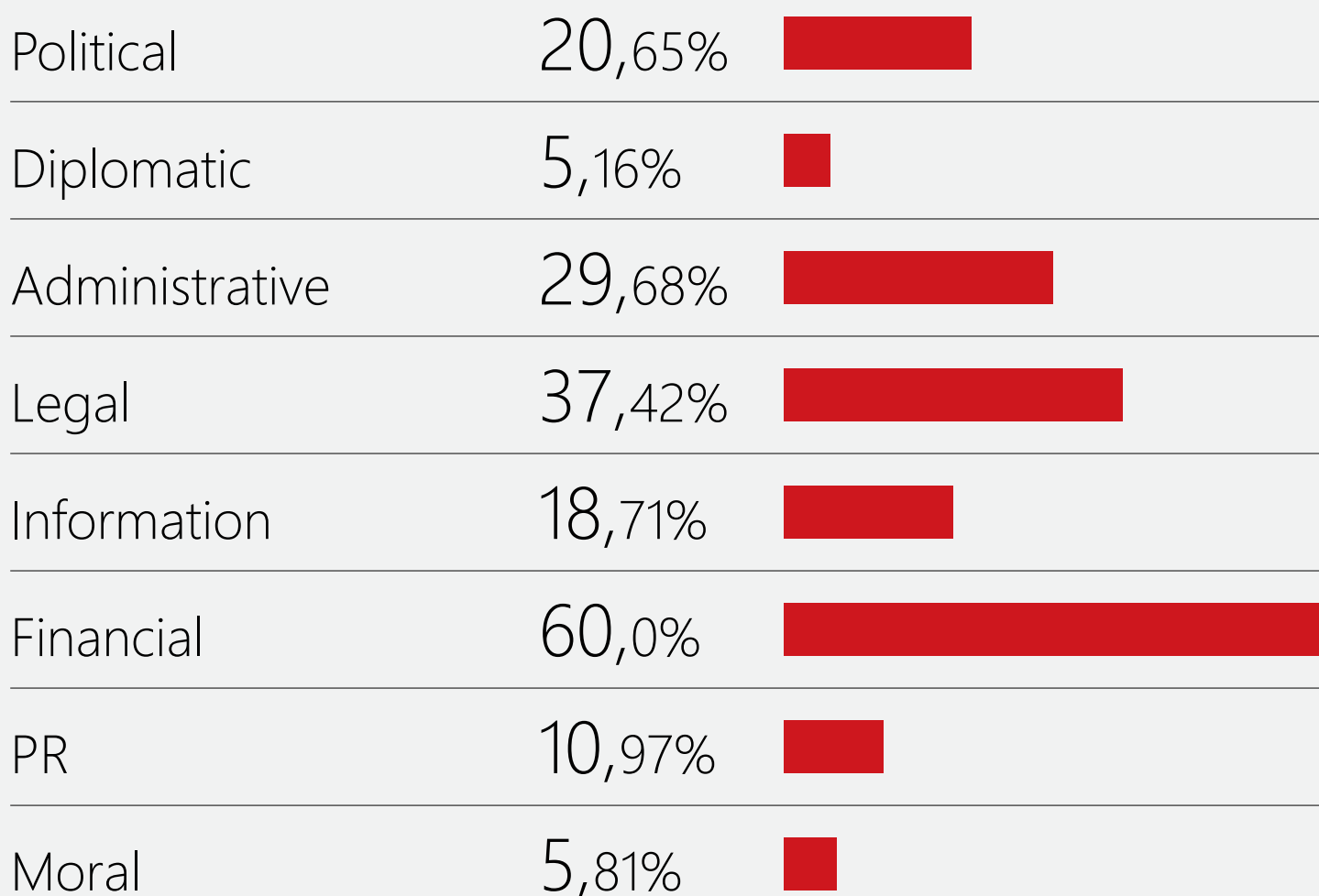
Russia’s position in the global rankings of innovation. Does it correspond to the actual innovation development of science, technology and business in our country?



Most (66%) of respondents think Russia’s place in the global innovation development ratings reflects the real situation adequately. Such an assessment indicates the ability of a large part of Russia’s innovation business community to adequately evaluate both the achievements and the current challenges to address.

Source: Survey of innovation market players, RVC, 11-24 April 2013

What form of support should be primarily provided by the state to globalize the Russian R&D segment?



The most productive forms of assistance in globalizing the Russian R&D segment are financial incentives and legal backing, say 60% and 37.42% of respondents, respectively.

(In the process of handling this questionnaire section, the respondents could select two possible answers)

Thus, the expectations of the business can be interpreted as follows: in the process of entering foreign markets the Russian innovative companies require a financial leverage and the professional services associated with the intellectual property protection.

Source: Survey of innovation market players, RVC, 11-24 April 2013

This legislative change would extend support to businesses outside Skolkovo, increasing the project's bearing on the country's socio-economic development and closer integrating it into the national innovations system.

Russia's innovation centers would be brought to more intimate cooperation, boosting their R&D potential and competitive strength.

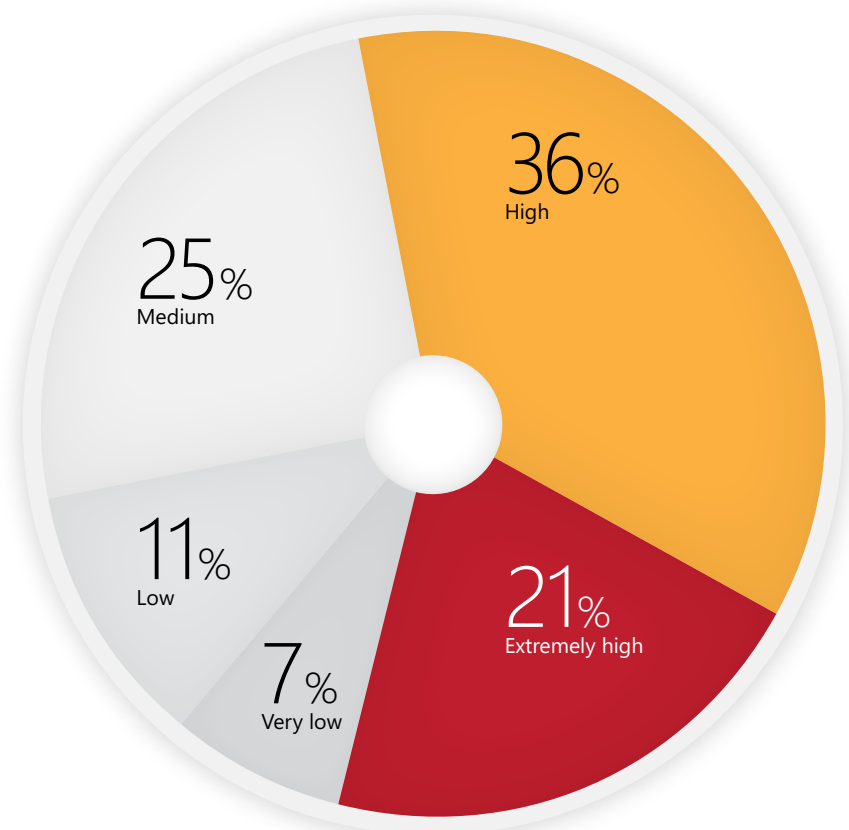
Innovations territories would be more appealing to researchers and R&D residencies.

Within a few years the projects so supported could become a serious source of fiscal revenue, and in the long term (incentives last 10 years at the most) the increased demand for innovations could compensate state insurance funds for the deductions they do not receive.

Eligible companies would have to allot 14% of income instead of the normal 34%. Only Skolkovo-qualified companies would be relieved. In particular, the company must be created according to Russian legislation, with its statutes allowing pure research in the fields prioritized by the Skolkovo law, that is, energy efficiency and conservation, nuclear and space technologies, medical equipment and pharmaceutical, strategic hardware and software.

As of 30 March 2013, the revised document has been approved by the Ministries of Education, Industry and Trade, Health and Regional Development. The Ministries of Labour and Finance have not approved it. The Ministry of Economic Development has prepared a list of disagreements.

How high is the risk of turning Russia into a global 'raw supplier' of innovation materials — human resources, startups, R&D achievements?



57% of the surveyed experts believe the chances of Russia to become a 'raw supplier' of innovation material abroad to be high and very high. This indicates that the 'habitat' for the innovation-oriented business is still underdeveloped. Much of the findings are important for development institutions, as the views of respondents can be interpreted as considering the chances of Russia to bring innovations to mature stages to be very low.

Source: Survey of innovation market players, RVC, 11-24 April 2013

Experts' recommendations

Expert interviews with players on the Russian innovations market have resulted in a number of suggestions and recommendations for quicker implementation of the Russian Federation's Innovations Development Strategy 2020 in the "Involvement in global innovation" venues. They include:

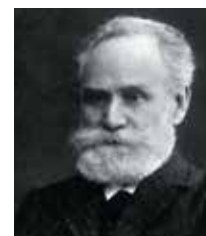
1. Development institutions' creation of mechanisms, with both finances and competences, to help Russian world-class innovations to the global market.
2. A strategic approach to R&D planning to ensure competitive advantage in the conditions of global challenges ("Do what brings money **globally**, what you do better than anyone else **in the world**").
3. Step-by-step removal of administrative and customs restrictions on operations of Russian R&D companies abroad.

Territories for Innovation

Regional Centers of Innovation Growth

“I’m a believer — my belief is that the progress in science will one day deliver mankind happiness”.

*I. P. Pavlov,
prominent Russian scientist, Nobel Prize winner in Physiology & Medicine, 1904*



Strategy

In innovation-oriented regions and municipalities with developed innovation infrastructure, high-tech companies, research and educational organizations and innovation centers will emerge, bringing together the available region-based federal and local educational, research and innovation infrastructure facilities. Alongside the implementation of major federal projects, including the Skolkovo Innovation Center, it will allow a network of intensive innovation growth centers in Russia to be established.

Strategy for Innovative Development of the Russian Federation for the period until the year 2020

The formation of innovation ecosystems in the most developed countries, at a certain stage in their history, led without fail to the emergence of the phenomenon of regional innovation clusters — areas where the processes of innovation and technology ‘genesis’ are particularly active and where a high concentration of all ecosystem participants can be observed.

The world’s best-known example of an innovation cluster is Silicon Valley on the US west coast: the birthplace of hundreds of high-tech companies and breakthrough technologies. Over the last thirty years, a large number of countries have attempted to reproduce this phenomenon with varying degrees of success.

International experience suggests that state investment in the creation of innovation infrastructure in a particular area (science parks, business incubators, research and development centers, etc.) by themselves do not guarantee a “Silicon Valley effect”. The emergence of an innovation cluster is always a result of activities and interaction across a large number of participants in the innovation ecosystem, who generally gather spontaneously in a limited area, and eventually form a vibrant and self-adjusting system of knowledge commercialization. The government can only facilitate and direct this process to a degree,

but the result will largely depend on private initiatives.

A successful innovation cluster is a subtle fusion of numerous elements. It is big science with plenty of promising ideas and pilot projects. It is entrepreneurial, scientific and engineering staff that are required to build new technology companies. It is sufficient venture capital destined to fund technology startups at all stages of their life cycle. It is service infrastructure that provides fledgling companies with a full range of non-innovation-based services — from legal advice to marketing. Finally, it is real demand (as a derivative of competition) — at a corporate level — for new technologies, innovative products and even technological companies, together with company pilot projects as part of M&A transactions. And all this should be accompanied by a supportive environment in the broadest possible sense: favorable legal and tax environments; the right entrepreneurial culture that also gives technology entrepreneurs the right not to succeed; broad public support; and a lot more. All this, melted down into the “pot” of a certain territory, forms an innovation cluster that can become a center of gravity for innovators and a “wholesale assembly line” for technology startups.

During Soviet times, our country created scientific clusters in the form of science towns (Novosibirsk’s Akademgorodok, Dubna, Protvino, etc.), but the new market environment requires the integration of missing elements and networking among those involved in the innovation ecosystem, based on market mechanisms. In these circumstances, international experience will certainly be of help.

In general, there are two main approaches to the creation of innovation clusters — American and conventional European. The first involves no noteworthy or results-oriented government participation in forming the cluster; in this case, the key driving factor and party most interested in the technological and entrepreneurial development of the surrounding area are major universities. The second — on the contrary — is based on the practice of active state involvement in forming clusters around historically-established educational and research centers, with government development agents playing a coordinating and supporting role for a substantial period of time.

The Strategy for Innovative Development of the Russian Federation for the period until the year 2020 provides for the establishment of a network of regional industrial clusters, unlocking the competitive potential of the territories, as well as the formation of a number of high-tech innovation clusters. This cluster-focused policy, when introduced, is supposed to help increase the competitiveness of business through the effective communication of cluster members, associated with geographical location; wider access to innovation, technology, know-how,

specialized services and skilled personnel; lower transaction costs; and with the implementation of joint cooperation projects.

MORE POSITIVE REGIONAL INNOVATION POLICY

Enhancing the profile of science cities

The Russian Ministry of Education and Science has prepared a Draft Federal Law No. 59542-6 regarding “Amendments to the Federal Law Concerning the Status of Science Cities within the Russian Federation” and a Federal Law regarding “Science and State Science & Technology Policy” (as it pertains to the criteria for assigning and maintaining science city status to a municipality). The Draft Law involves changing the system of science city

Profile of special economic zones (SEZ) of industrial and technology types created in Russia

Industrial SEZ

SEZ “Alabuga”	Manufacture of automobiles and spare parts, construction materials, chemicals and petrochemicals
SEZ “Lipetsk”	Manufacture of automobiles and spare parts, construction materials, chemicals and petrochemicals
SEZ in Samara Region	Manufacture of automobiles and spare parts, construction materials, chemicals and petrochemicals
SEZ in Sverdlovsk Region	Manufacture of automobiles and spare parts, construction materials, chemicals and petrochemicals

Technological SEZ

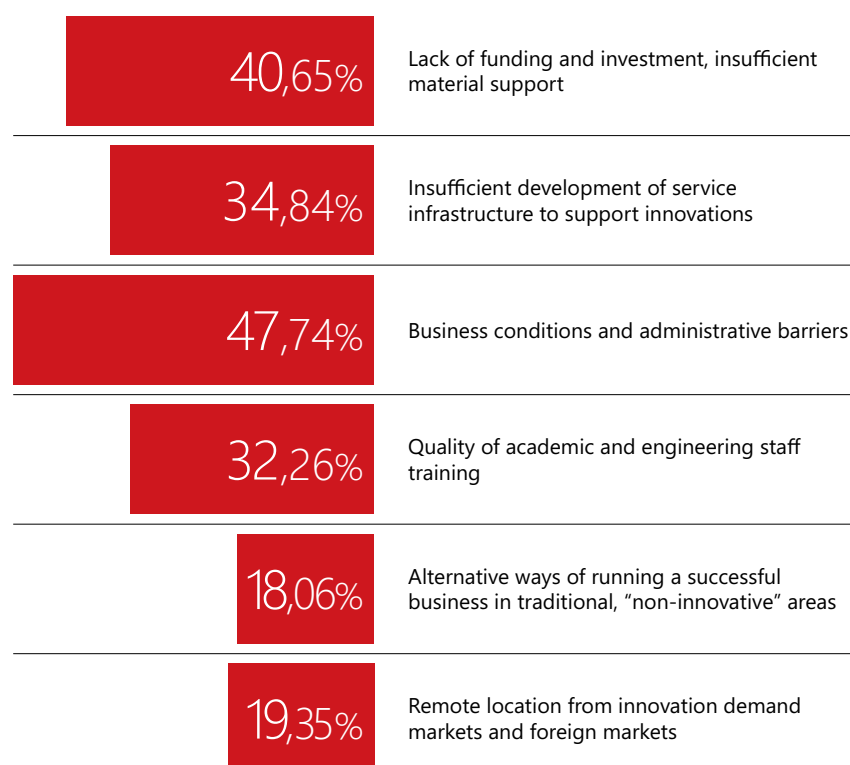
SEZ “Tomsk”	Nano and biotechnology, medical technology, electronics and communications, IT
SEZ in Saint Petersburg	Precision and analytical instrument industry, medical technology, electronics, communications, nanotechnology, nuclear physics, IT
SEZ in Moscow	Pharmaceuticals, biotechnology, micro- and nanoelectronics, power saving technology, IT
SEZ “Dubna”	Electronics and communications, nano- and biotechnology, nuclear physics, IT

Source: RUSSEZ (OJSC “Special Economic Zones”)

state support: inter-budget transfers are suggested based on the results of tenders of science city development projects submitted by such cities, rather than depending on the population of science cities. The assigning of the status is supposed to be linked not only to the presence of high-class research institutions, but also to the activity of regional and municipal authorities in establishing regional innovation systems and to innovation business behavior.

Local governments are entitled to support science, technology and innovation in the science city.

What key factors hinder accelerated growth of innovative business in the regions?



Analyzing the key factors hindering accelerated growth of innovative business in Russian regions, the respondents primarily highlighted "business conditions and administrative barriers" (47.74% of replies).

Other restrictions include lack of funding and investment, insufficient material support (40.65%), insufficient development of service infrastructure to support innovative business (34.84%) and quality of staff training (32.26%). (During the survey, experts could choose any 2 replies.)

Source: Survey of innovation market players, RVC, 11-24 April 2013

In order to generate balanced approaches to assigning the status of science city, it has been proposed that criteria be established to determine the level of scientific, technological and innovative potential and prospects for further innovative development of the relevant subnational entity.

Changes are suggested for the mechanism for assigning and retaining the science city status. In accordance with the draft law, the status will be assigned to a municipality by the Russian Government and will require subsequent reaffirmation every 10 years. Science city status is terminated if not reaffirmed, and may be terminated either by the Russian Government or in the case of a reasonable termination request from any representative body of the science city.

On June 19, 2012, Russia's State Duma passed the Draft Federal Law on its first reading. Currently, it is under preparation for its second reading.

Regional innovative development projects on the basis of federal and regional educational, research and innovation infrastructure.

As part of an integrated program, titled "Establishing Science Parks in the Russian Federation in the Field of High Technology", approved by Russian Government Decree No. 328-r (March 10, 2006), federal budget subsidies for the creation and development of high-tech science parks in 2011 totaled RUB 1.5 bn, including RUB 221 million for the Republic of Tatarstan, RUB 500 million for the Novosibirsk Region, RUB 81 million for the Kemerovo Region, RUB 259 million for the Penza Region and RUB 441 million for the Samara Region.

In 2011, the "Establishing Science Parks in the Russian Federation in the Field of High Technology" integrated program entered development phase 3. Phase 1 (2006-2007) involved design work and other preparations for establishing science parks. Phase 2 (2008-2010) saw infrastructure developed. Phase 3 (2011-2014) will involve the establishing of ecosystem elements on the basis of technology parks. Within the framework of the ecosystem, science parks are to become part of a single system, which allows innovation project to proceed through all stages — from R&D to small-scale production. Science parks are created as full-cycle facilities. As part of the program, they work together to achieve synergy and provide full-range services to resident companies.

The establishing of infrastructural facilities financed from the state budget is a distinctive feature of science parks provided for by the program. It should be noted that high-tech science parks are established by Russia's constituent entities to specific regional needs and specializations. This process involves universities and R&D institutions, which then act as initiators, clients and joint participants of research and promising pilot projects, as well as

preparing qualified experts in high technologies.

As of the end of 2011, several science park facilities had been put into operation: The West Siberian Center for Innovations, Tyumen Region; science parks in the Republic of Tatarstan (Kazan) — IT-park and Khimgrad Technopolis Extension 1; and initial extensions of science parks in the Novosibirsk and Kemerovo Regions.

On October 6, 2011, "IT Park Ankudinovka" business incubator, in Nizhny Novgorod Region, was launched as part of the program.

On January 25, 2012, as the Center for Information Technology, Novosibirsk was put into service, Extension 2 of the Akademgorodok Science Park, Novosibirsk, was launched.

According to data from regional authorities within the Russian Federation, the revenue of companies resident in science parks, calculated cumulatively, exceeded RUB 39 bn between 2009 and 2011 (with around RUB 17 bn in 2011 alone). As such, the tax refund to budgets of all levels totaled RUB 5.6 bn. The target revenue for 2014, calculated cumulatively, should reach RUB 106 bn.

The creation of 9,000 jobs lends evidence to the program's social efficiency. By 2014, 16,600 jobs should have been created.

The signing of agreements on cooperation and support for project implementation by and between science park residents, the Skolkovo Innovation Hub (July 2011) and RVC (October 2011), was seen as an important step. To coordinate efforts to develop a competitive, socially-oriented economy, the Association of High-Tech Science Parks (Nptechnopark.Ru), a non-profit partnership, was established in Russia in 2011. The interaction between science parks and Skolkovo and the emerging structure of regional representative offices of the Agency for Strategic Initiatives to Promote New Projects will establish a system of project promotion on a scale from local to global.

DEVELOPING INNOVATION CLUSTERS

Creating fully-fledged innovation clusters in the most innovation-intensive regions.

"The Concept of Long-Term Social and Economic Development of the Russian Federation to 2020" makes allowances for the formation of a Russia-based network of industrial clusters, unlocking the competitive potential of the regions, as well as the formation of a number of innovation high-tech clusters (hereinafter referred to as "the clusters"). The Concept of Long-Term Social and Economic Development of the Russian Federation to 2020 places emphasis on the fact that the cluster-focused policy, when introduced, will help increase the competitiveness of business through effective communication of cluster members, associated with geographical loca-

tion; wider access to innovation, technology, know-how, specialized services and skilled personnel; lower transaction costs; and with the implementation of joint cooperation projects.

The list of 25 regional innovation clusters was approved by Russian Government Order No. DM-P8-5060 (August 28, 2012).

Pursuant to Russian Government Order No. DM-P8-5060 (August 28, 2012), the Ministry of Economic Development and Trade, jointly with the executive bodies concerned, has worked out the issues concerning the provision of state support to regional innovation clusters.

The main areas of work for the support of regional innovation clusters are as follows:

- subsidizing the budgets of Russian constituent entities in order to introduce measures provided for by development programs for regional innovation clusters;
- providing support for the implementation of program measures associated with the development of regional innovation clusters within the framework of federal target programs and government programs of the Russian Federation;
- involvement of state development institutions in the implementation of regional innovation cluster development programs;
- encouraging major state-owned companies which implement innovation development programs to take part in the activities of regional innovation clusters;
- extending some of the tax incentives legally provided for Skolkovo residents to innovation cluster sites in other territories.

EXPERT OPINION

“There is an obvious positive dynamic in infrastructure for R&D. New instruments to support small enterprises appear, and earlier conditions and incentives also remain. The Moscow Development Fund of Venture Capital Investment in Research & Technology Small-Scale Businesses has started a credit program for companies at the earliest stages. That is clearly the area where instruments are needed the most. We have already approved around 17 projects, 6 received funding. My own experience confirms that the idea of public-private partnerships is right. State bodies should follow private investors' expertise when distributing investments or grants. For the Moscow innovations ecosystem, I can mention the success of technoparks. The Strogino technopark is an excellent example of a park where companies are growing, attracting investments, starting regional and global expansion. The park's residents include such successful projects as LinguaLeo, Your Tutor and others. No doubt: the state is supporting the infrastructure the right way. For some instruments it's too early to say if they work or not. Innovations in the country can't "spring up" in a year, two or even five. The game rules on the innovations market should not change too often. To support R&D even more effectively, we need coordination between existing programs, not invent something else.



ALEXEY KOSTROV,
EXECUTIVE DIRECTOR OF THE MOSCOW SEED FUND

Further in the future, government bodies and local authorities will contribute to the institutional development of clusters and mechanisms to support projects aimed at improving the competitiveness of businesses, providing an environment that enables cluster development.

Promoting the institutional development of clusters involves initiating and supporting the establishment of a dedicated organization specialized in cluster development (cluster development centers), as well as the strategic planning of cluster development, the establishment of effective communication between cluster participants and the promotion of enhanced cooperation between them.

Developing mechanisms to support projects aimed at improving the competitiveness of businesses and promoting the efficiency of their interaction will involve:

- fostering innovations and the development of mechanisms for technology commercialization; supporting collaboration between R&D groups and businesses;
- improving the quality of management at cluster business units; improving suppliers' competitiveness and product quality; and developing mechanisms for subcontracting;
- facilitating marketing of products (goods and services) produced by cluster participants, and attracting direct investments.

Providing favorable conditions for cluster development will include incorporating measures to improve the efficiency of the vocational education system; cooperation between enterprises and educational institutions; implementation of targeted

investments in the innovation infrastructure development; provision of tax incentives in accordance with Russian legislation, as well as eliminating administrative barriers.

In order to encourage the development of regional innovation, cluster development in the Russian constituent entities will be financed by the state on a competitive basis. As such, Federal Law No. 216-F3 (December 3, 2012) regarding 'The 2013 Federal Budget and the 2014-2015 Planning Period' provides for subsidies from local budgets to the amount of RUB 1.3 bn to introduce in 2013 measures stipulated by programs for the development of regional pilot innovation clusters. In accordance with Decree No. 188 (March 6, 2013), the Russian Government approved the Rules for Providing Budgets of Russia's Constituent Entities with Subsidies from the Federal Budget in order to Introduce Measures Stipulated by Programs for the Development of Regional Pilot Innovation Clusters;

For obvious reasons, the largest hub and the most developed segment of Russia's regional innovation economy, with established infrastructure, is Moscow. Moscow-based tech companies have the opportunity to enjoy financial, HR-related and other high-quality resources. According to many indicators, including the level of competition which enables market development, Moscow is among the world's leading innovation hubs. At the same time, the substantial costs associated with introducing urban business innovations should be taken into account. Given the objectives set out in the Strategy, it is deemed reasonable to generate a friendlier environment for the Moscow-based innovation business, which, among other things, will allow "project leaks" to be avoided. The Russian capital should not be used as a 'transit point' for those Russian companies developing and introducing innovative solutions, products and world-class quality services to the market.

The city has a good number of tech companies successfully developing global-scale business and seeking no changes to jurisdiction: more often than not, conducting economic activities abroad employs branches or subsidiaries established in other countries, while the core competence and R&D centers are located in Moscow. However, labor costs and outlays associated with renting premises, utility services and acquiring other resources have become increasingly important in the cost structure of Moscow-based tech companies. This means that the aggregate costs incurred by a Russian company in comparison with its foreign competitors are higher. As a consequence, the overall competitiveness of the domestic innovation sector demonstrates a downward trend on a global scale.

On January 28, 2013, speaking at a meeting of IT business companies with Moscow mayor Sergey

EXPERT OPINION

“There are real mechanisms for innovations support shaping up in Russia. Funding is available from government and private sources. The policy of R&D support allows to smooth out local administrative issues here and there in the process. The “innovations lift” has been more or less created, but its efficiency is limited by investment size. For now soliciting over a million dollars is difficult. One has to start projects in trial mode, get some limited revenue and only then develop independently. A tactic like that costs time, meanwhile competition starts similar projects and the technology may turn obsolete.

Unfortunately, there is still no continuous R&D ecosystem in the country. Every region has its own set of support tools, and some can't even imagine that R&D can be a part of the real economy.

I think we need more regional centers to promote an innovations-friendly environment, learn targeted funding, have innovations companies in a separate processing register with the tax service and so on.

On the whole we need an environment that encourages start-ups — effective science and proper education. Then we need to support them throughout the lifecycle, on a case-by-case basis.



RAMIL RAKHMATULLIN,

DIRECTOR OF NANOSINTEZ LLC (R&D COMPANY OF THE ORENBURG STATE UNIVERSITY)

Sobyenin, Natalya Kasperskaya, CEO of InfoWatch, said that hiring skilled personnel in Moscow is becoming more and more expensive. In the cost structure of IT companies, 50-75% is spent on HR — including both direct costs (salaries, taxes) and indirect ones (e.g., renting space for staff and creating a necessary work environment): this is a distinctive feature of this kind of activity which should be taken into account in the development of measures to support domestic IT companies. Innovative business is primarily the 'business of knowledge', where human capital is a core resource.

Formulating her proposals to the Moscow mayor, Kasperskaya came forward with an idea to further develop the real estate infrastructure of the Russian capital, which will allow both major tech companies and startups to rent office space on more favorable terms and conditions. It is important to ensure high transport accessibility for such facilities.

Kasperskaya stressed that direct incentives addressed to specific companies are not the most effective form of business promotion. Emphasis should be placed on system support tools, equally transparent both for the state and the business community.

Above all, she suggested continuing with the harmonization of the existing tax administration system with respect to the companies whose activities incur a high share of in-house R&D costs. Developing advanced technologies, products and services often requires extensive work on how they are "packaged" and getting them onto the market, which impedes high-tech companies from gaining profit comparable with those of equipment suppliers. In this regard, an innovation-focused company is at a disadvantage as compared with a 'reseller' company, Kasperskaya explained.

This problem could be solved through more careful study of the relationship between innovation companies and tax authorities in the framework of the current fiscal administration system.

Creating innovation clusters — an example from the Tomsk Region.

In 2011, Russia's Ministry of Economic Development and Trade involved the executive authorities and the Tomsk Region in drafting a concept for the establishment of a center for education, research and development in the region (pursuant to Russian Government Decree No. 1756-r (October 6, 2011)).

Work on establishing the Center ("INO Tomsk 2020" project) has been conducted by the Administration of the Tomsk Region since 2010. The project is aimed at creating a high-capacity innovation hub on the existing educational, R&D and production base of the Tomsk Region, adding the required innovation, transport and social infrastructure elements.

Two main phases for "INO Tomsk 2020" project development have been scheduled. Phase 1 (2011-2015) — attracting and using investments: development of the R&D park, university campus, innovation infrastructure, transport and social infrastructure, improving terms of cooperation for innovation institutions, including attracting large companies to the Tomsk Region, developing the potential of the Tomsk scientific and educational complex, continuous and multi-level education, innovative entrepreneurship. Phase 2 (2016-2020) — scaling innovation, achieving innovation and technology leadership in project priority areas; achieving targeted performance of the project.

The scale of the project between 2010 and 2013 has been assessed at RUB 48.5 bn, from all sources of funding within core project lines. During 2013, as a result of the region's policy to attract investment, the project budget will be re-evaluated to refine allocated funds, introducing new measures and putting new facilities into operation.

According to the "INO Tomsk 2020" Concept, the Research and Education Park of the Tomsk Region is a collection of organizations, including institutions of higher education, R&D organizations and innovation infrastructure elements arranged within one or more areas and having a functional relationship:

- 10 institutions implementing higher education programs, including six state universities (Tomsk State University, Tomsk Polytechnic University, Siberian State Medical University, the Russian Ministry of Health, Tomsk State University of Control Systems & Radioelectronics, Tomsk State University of Architecture & Construction, Tomsk State

EXPERT OPINION

“The Technopark of Novosibirsk Academgorodok has some interesting activity going on, a community of young innovators is appearing. When these people meet each other at various events or just in coffee-rooms, they discuss not soccer (like ordinary folk) and not fundamental science (like graduate students) but business problems and solutions. That kind of socializing starts up a chain reaction that gets tech businessmen learning the ropes much faster than they would on their own. People's thinking changes because technoparks assemble a critical mass of specialists and projects. That is a clear sign a culture of innovation is really emerging. There is definite progress from the situation of 5-7 years ago.



The efforts to bring up innovators target more and more young people. But we need to understand that in high technologies start-ups should really be left for those who've matured somewhat. At least that's how the world does it. In Russia they are a lot younger. Then again, where would we get that many start-uppers in their 40s and 50s? Maybe that's why there are so many low-quality innovations projects on the home market. Young start-uppers don't always have life experience and professional competences — in technology, in business.

DMITRY KLIMOV,
MANAGER OF FLUORESCENT NANOSCOPE PROJECT

Pedagogical University) and a branch of the National Research Nuclear University "MEPhI" (Seversk Institute of Technology), of which three are national research universities;

- 11 research institutes;
- Tomsk-based RAS and RAMS scientific centers;
- 6 RAS and 6 RAMS institutes;
- 76 institutions related to research and the organization of innovation infrastructure.

The primary task in the development of the Research and Education Park in 2012 was the upkeep of positive dynamics in the development of science, education and innovation sectors, as well as securing leading positions of the Tomsk Region in relation to other Russian regions.

In 2012, the amount of funding for research and education activities within institutions affiliated with the Tomsk scientific and educational complex exceeded RUB 25 bn — 9% (RUB 2 bn) more than in 2011. The amount of funding for research activities increased by 12% and totaled RUB 12.1 bn.

By the end of 2012, a considerable share of extra-budgetary funding of scientific activities, about 52%, had been retained. 33% of funds allocated by the state for research activities were obtained on a competitive basis within the framework of federal target programs, grants and competitive projects.

2012 saw an enhancement in the scientific research instrumental base: the acquisition of up-to-date scientific and diagnostic equipment totaled RUB 3.8 bn — RUB 300 mn more than in the previous year.

The Tomsk Region is still in the top five Russian regions by number of students per 10,000 inhabitants, despite a downward trend in the overall number of students (769 — in 2011, 710 — in 2012).

Wages in the R&D sector continued to grow: in 2012, salaries in the region's R&D sector, amounted to RUB 40,100 — 1.5 times more than the average

salary in the region's economy and 14% higher than the previous year (RUB 35,200).

According to estimates, in 2012 the region created 101 small-scale innovation businesses (compared to 58 in 2010; 82 in 2011). However, the number of businesses established in accordance with Federal Law No. 217 (August 2, 2009) reduced to 19 small-scale innovation businesses in 2012 (41 in 2010; 24 in 2011). Such a decrease has taken place due to the aggressive establishment of ready-to-operate development organizations in the first three years this Law has been active.

Other outcomes of the development of the Tomsk Research and Education Park as of the end of 2012:

- 602 grants obtained from the Russian Foundation for Basic Research (475 in 2010, 530 in 2011);
- 77 grants allocated by the Russian Foundation for Humanities (50 in 2010, 53 in 2011);
- 5 Tomsk-based research groups awarded grants by the Russian President to support leading scientific schools in Russia;
- research works conducted, sponsored by 25 presidential grants aimed at supporting young Russian scientists;
- 236 scientific conferences held, including 90 international.
- 424 Russian patents obtained (494 in 2010, 444 in 2011);
- following the results of tenders held and in accordance with Russian Government Decree No. 218 (April 9, 2010), the state subsidized 11 projects to a total amount of RUB 3.9 bn; as such, the region was ranked 4th among the constituent entities of the Russian Federation after Moscow (51 projects), St. Petersburg (21) and the Republic of Tatarstan (12).

According to the concept, the challenge to be addressed by the Research and Education Park is to ensure breakthrough innovation and cutting-edge technology through advanced commercialization of R&D and innovation solutions.

The following seven breakthrough areas for work have been identified for the "INO Tomsk 2020" project:

- creation of a model of continuous and multi-level system of education;
- energy-saving technologies and technical means for energy-intensive sectors of the economy;
- nanoelectronics and intellectual power electronics;
- nanotechnology, advanced materials and development of beam, plasma and electric-discharge technologies;
- high-tech medicine, medical biotechnology and pharmaceutical technology;
- efficient nature management and thorough processing of natural resources;
- nuclear technologies.

EXPERT OPINION

“In developing an infrastructure for innovations the central regions of Russia could learn from the Republic of Tatarstan, where a powerful “gravity center” for R&D has been created, especially the IT parks in Kazan and Naberezhnye Chelny. There a project that wants to become a high-tech business and has showed some good results at the early stage can pass selection and get accepted in a vivacious and active environment with tens of other projects like itself, with investors coming every month, with the projects getting financed, supported with grants and private money. It would be good to make all of Russia an environment like that. The question is, can be done with the technoparks we have? By the way, the Tatar experience is already getting applied in Moscow. For example, the Moscow Institute of Physics and Technology is opening an IT park. And the team doing it includes the people who initiated the Tatarstan technoparks. I hope the result will be as impressive.



RENAT GARIPOV,
CO-FOUNDER OF GREENFIELD PROJECT

2012 saw five successfully projects accomplished with a total funding of RUB 2.2 bn between 2010 and 2012 (the amount of subsidies from the federal budget to finance Tomsk-based R&D universities amounted to RUB 1.1 bn).

As part of a joint project on the lighting engineering cluster development (OJSC NIIPP, Tomsk State University of Control Systems & Radioelectronics), a new technology was developed for high-performance and reliable solid-state light sources and lighting fixtures.

On December 22, 2011, the TechLab was open to carry out debugging processes and train specialists in handling new production equipment. Building a plant for LED and LED-device production has been scheduled: from 2013 the technology will be improved at businesses' own expense.

As part of the implementation of a joint project by CJSC Mikran Research & Production and Tomsk State University of Control Systems & Radioelectronics, a new radio engineering plant has been build in Tomsk to produce telecommunications, radar and instrument-making equipment, competitive in the global market, building on previously-developed technology, using its own electronic component base.

Construction costs amounted to RUB 1 bn, of which RUB 600 million were assigned from Mikran funds, RUB 400 million through borrowing. The plant is scheduled for commissioning in Q2 2013.

As part of the implementation of a joint project by Tomsk State University and OJSC ISS (Zheleznogorsk), a software and hardware complex has been developed for aligning a range of "system-on-chip" electronic modules, used in the control and power systems of spacecraft communication, navigation and remote sensing with an extensive active life cycle. The business unit has an established and functioning production line. Commercial production of goods is scheduled for 2013.

As part of the implementation of the joint project by Tomsk Polytechnic University and OJSC NEVZ-Soyuz (Novosibirsk), titled "Establishing the Industrial Manufacture of Functional and Constructional Nanostructured Ceramic Products for High-Tech Industries", seven production lines for the manufacture of a high-tech product range have been launched. Production operations commenced in January 2013. The business unit has established a "Powder Technology" educational and research laboratory to train staff on new production lines, arrange student internships and perform R&D.

As part of the implementation of the joint project by JSC Federal Research & Production Center Altay and Tomsk State University, titled "Process Development and Organization of Pilot Production of Crystalline Glyoxal for the Creation of High-Priority Advanced Composite Materials", Federal Research & Production Center Altay has opened new crystalline glyoxal production facilities. Pilot batches of products have been produced, with comprehensive testing arranged in technology cycles of the defense complex enterprises. New production capacity is more than 500 tonnes per annum; the cost has been reduced by 20%. The project, when implemented, will enable the substitution of imported glyoxal with domestically-produced stock, in the amount of at least RUB 500 million annually.

In 2012, six projects from the Tomsk region won phase 3 of the competition organized by the Ministry of Education to establish high-tech production facilities, coming second among Russia's constituent entities (after Moscow). The total funding for the six projects between 2013 and 2015 will amount to RUB 1.6 bn, of which federal subsidies for R&D funding by Tomsk universities will total RUB 834 million, funds from the projects' initiators will almost match this amount.

Experts' recommendations

Expert interviews from participants in the Russian innovation market have identified a number of suggestions and recommendations to intensify the implementation of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 in the same way as the "State of Innovations".

1. Gradual elimination of administrative barriers to business in the Russian regions.
2. Decisive measures by the state, scientific communities, development institutions and businesses to improve expert training and raise the level of research.
3. Correction of regional biases: providing access to basic resources available to innovators across the country.
4. Establishing of powerful R&D support hubs in Russia's federal regions.
5. Enhanced access for novice innovators to grant support tools for startups.




Conclusions and suggestions

The “traffic light” in innovations

Results from a survey of Russian innovations market players

(survey done by RVC between 11 and 24 April 2013)

Nurturing of innovations competences

Growth of “innovative individual” competences	42% of respondents feel the sharpest lack in the area of entrepreneurial competences.	
Results of promoting innovations	67% of respondents believe the Russian government and its institutions’ efforts at promoting innovations to be effective.	
Growth of competences of “innovative individual” among Russian scientists and educators	55% of respondents think “very few” of such workers are competent. 32% think the share is “less than half”.	

Innovative business

Quality of available capital	A total of 43% of respondents consider the capital available to innovations companies in the Russian market “smart money”.	
Evaluation of market clout of investors and investees	42% of respondents think the innovations segment of the Russian economy “an investor’s market”, only 9% “a start-up’s market”.	
Share of quality projects in the Russian tech start-up market	Only one fourth of start-up companies are currently pursuing projects with good quality.	
Assessment of sector bias in the technological innovations business segment	Correction of sector bias of some scope seems necessary to 41% of those surveyed, only 15% are against such measures.	
Attitudes towards the copycat model	The majority of respondents (61%) think replication of foreign business models and technologies in Russia to be proper and permissible.	
Factors preventing successful commercialization of R&D in Russia	35% of respondents believe that the key obstacle to commercialization of innovation is low demand from the real economy.	
Appeal of continued Russian jurisdiction for R&D companies	59% of respondents think the stimuli in place lacking.	
Efficiency of Russian intellectual property safeguards	33% of experts think the intellectual property protections in Russia “poor”, 21% “very poor” (54% in total gave some kind of negative answer).	

Legend:



Innovations-friendly zone.



Attention zone requiring intervention by the government, development institutions and innovations market.



Trouble zone: quick and decisive joint efforts by the government, education system, science and business are needed.

Effective science

Effectiveness of government science spending

Only 16% of respondents believe that the government investments in science are now more effective.



Innovative government

Incorporation of innovations into the Russian system of government

Most of the experts evaluated the efficiency of incorporating innovations into government in Russia as "low" (55%), 14% as "extremely low".



Public procurement and innovations

Only 13% of the surveyed agreed that the public procurement system, as it is now, contributes to the "development of innovation in Russia".



Efficiency of fiscal reliefs and remissions

45% of respondents think the system of tax exemptions and reliefs for R&D "ineffective", 16% "extremely ineffective".



Innovations infrastructure

Supportive infrastructure for innovations

42% of respondents approve the government and its institutions' actions towards a supportive infrastructure for the innovations market.



Innovations support instruments

The market players decisively (64%) spoke in favor of the state's continued use of a balanced set of instruments, financial and otherwise, to support innovations.



Appraisal of the environment for introduction and commercialization of innovations

56% of the surveyed gave high marks to the governmental efforts to create an innovations-friendly environment.



Participation in global innovation

Russia's position in international rankings of innovation in economics

Most (66%) of respondents think Russia's place in the ratings reflects the real situation adequately.



Support of globalizing the Russian innovations market

The most productive form of assistance in globalizing the Russian R&D segment is financial incentives, say 60% of respondents.



Risks of an "innovations drain"

36% of the surveyed believe the chances of Russia becoming a "raw supplier" of innovations material abroad to be high, 21% — very high (57% together).



Innovation territories

Key factors stifling growth of R&D in Russia's regions

"Conditions for business and administrative barriers" (47%).



The survey for this report gathered the opinions of 155 Russian innovations market players and allowed us to pinpoint “innovations-friendly zones”, responsive to investment, as well as “trouble zones”, some of them in need of drastic action.



It is evident that in the last few years Russia has made substantial progress towards, e.g., promoting innovation and creating a supportive infrastructure for it. The Russian market participants agree that sector and stage bias in this segment of the economy must be consistently eliminated. Most of them believe, however, that Russia’s position in international ratings for R&D is well-deserved. All in all, Russian innovators have showed themselves cognizant of both successes and failings.

A late large breakthrough is notable improvement of the environment for innovation and its commercialization. Russia has become a country where bold ideas not only spring to life, but go on to found a business.

As a final point, Russian innovations companies expect not so much “hand-outs” from the state and its development institutions as a useful set of financial and other instruments to support them. The only exception is bringing domestic R&D business out to the global market; most of those surveyed thought powerful “leverage” from the state needed for exporters of innovative technologies, goods and services created in Russia to markets elsewhere.



Some parts of the innovations infrastructure, however, definitely need change. In helping Russian citizens grow their innovations competences, encouragement of entrepreneurial qualities is especially important.



The capital available in the Russian innovations market not yet in every case may be categorized as “smart money”. This, however, is a feature of the young age of the domestic knowledges industry, where both start-up founders and investors must learn their way.



There is “competition for investors” attention, but no shortage of money in the market. On the contrary, total yearly supply of capital in the Russia’s ventures market exceeds qualified demand by 6-7 times, compared to 4-5 times in developed markets. Thus, improving quality of investment projects and their “packaging” — technological, marketing and so on — becomes a priority in the market building.

Many tech projects in Russia, especially in the e-commerce segment, are copycat versions of services elsewhere. This fact is not necessarily so much a reflection of the Russian companies’ habit to “appropriate” as their readiness to provide the domestic customer with services popular in other countries.



One attention zone for the government and the entire Russian innovations community is various barriers and obstructions to business not quite overcome. They include:

- rather low level of innovations competences among scientists;
- inferior technological and marketing development of some projects declared innovative;
- low demand for innovations from the real economy;
- weak fiscal stimuli for innovations;
- gaps in the current intellectual property protections.

Work to improve the entrepreneurial climate in the country and bring down bureaucratic barriers, particular stoppers for the R&D business, must also continue.

Solving these problems will minimize another risk — losing to a drain the country's best personnel, technologies and projects, i.e. key resources of an innovative economy.

A survey among 160 innovations markets experts was performed for this report. 155 questionnaires were filled correctly and processed.

General portrait of the survey participants

The respondents were involved in the following fields, by their own answers (multiple choices were allowed).

Technology segment businessman	50
Scientist.....	21
Educator.....	19
Representative of a development institute / infrastructure project to support innovation.....	35
Consultant	28
Big business.....	14
Small or medium business.....	28
Government official.....	1
Other.....	15

The experts' main suggestions towards the Russian Federation's Innovations Development Strategy Until 2020.

Nurturing of innovations competences

- 1 Affirmation of a positive image of an entrepreneur in general and promoting the innovations technologies business as one of the main venues of social, economic and personal achievement. Bolstering in society at large the main entrepreneurial qualities — willingness and readiness to create one's own business, taking the risks, and capacity to think globally.
- 2 Modernization of the national system of higher education to provide world-class skills and knowledges in every field and discipline. Assistance in helping the Russian higher educational system switch decisively from an inertia-driven, "catching up" model to the forward-looking and competitive one. Successes of graduates in the innovative technologies disciplines can become a major performance indicator for the system. On the whole, higher education must not only consider current or past demand in human capital, but also create workers capable of envisaging fresh technologies, goods, services, solutions and entire new market segments.
- 3 Active introduction of innovative environments to colleges, supplying young specialists with the organizational and financial assets to make their first steps towards an R&D business while still studying, learn how to commercialize and "package" ideas. Educational establishments' boards of directors and faculty lists must include more managers and businessmen with sound expertise in high technology and innovations.
- 4 Identification and active use of best practices in college/business interaction.
- 5 Learning from the thriving relationships of colleges, scientific institutions and business existing abroad, continuation of the best traditions of Russia's own educational system.

Innovative business

- 1 Expanding and improving the measures and instruments of state support for exporters of innovative products.
- 2 Developing the governmental and infrastructural support for intellectual property rights of Russian innovations, including exports.
- 3 Active state and development institutions' efforts to stimulate the domestic mass innovations market, make its b2c segment a priority market for Russian innovators.
- 4 Knockdown of administrative barriers and fiscal hurdles, removal of customs, currency exchange and exports burdens.
- 5 Creation across Russia, federal regions level included, of powerful R&D centers to draw in and generate innovations and make use of synergy. Such centers and innovators need to be provided with the resources they need, from venture investments to engineering expertise.

Effective science

- 1 Assistance to scientific institutes in changing over to the new competitive roadmap and world trend-based knowledge model.
- 2 Joint efforts from the government, development institutions, the scientific community and business to open the market to those innovations from the defense sector that show the greater commercializing potential (with defense capacity and legal aspects of unique technologies considered).
- 3 Search and articulation of demand from the real economy for breakthrough research and technologies in several key areas, including IT, telecommunications, biotech, robotics.
- 4 Better transparency for projects to commercialize state-funded intellectual properties. Creation of effective spin-off innovation possibilities for colleges and scientific bodies.
- 5 Gradual bolstering of domestic demand for R&D.

Innovative government

- 1 Further decrease of state participation in the economy.
- 2 Modernization of the public procurement system, with its legal norms. The system must also be made more transparent to innovators and the government show greater interest in their technologies, goods and services.
- 3 The financial security requirements for innovations bidders on state tenders need to be further lowered.
- 4 Government non-interference in selection of technologies, platforms and other technical details. Tech industries must be managed indirectly, through performance indicators.
- 5 "Total inspection" as the model for greater professionalism and innovative environments in the growing knowledge community.

Participation in global innovation

- 1 Development institutions need support mechanisms, with both finances and competences, for Russian companies whose achievements contribute to entrance into the global market.
- 2 When promoting innovation, planet-wide thinking needs to be emphasized ("Do what makes money *globally*, what you do better than anyone *in the world*").
- 3 Step-by-step removal of administrative and customs restrictions on operations of Russian R&D companies.
- 4 Active involvement of professional foreign investors in the domestic market.
- 5 Help with globalization of the Russian innovations segment, support of international cooperation and Russian companies entering foreign markets.

Innovations infrastructure

- 1 Speedier competence transfers, both vertical, from investors and late-stage companies to early-stage companies, and horizontal, e.g. between tech developers in different industries. The "innovation lift" needs to spread competences to the entire market.
- 2 Decrease of the bureaucratic drag and cost of applying for the support instruments offered by the development institutions.
- 3 Greater efficiency of the innovations market "pipeline", harmonizing entry and exit project flows.
- 4 Significant nation-wide expansion of the grant system for start-ups.
- 5 Development institutions must use a balanced set of financial and other support instruments in monitoring the innovations market.

Innovation territories

- 1 Gradual elimination of administrative barriers to business in the Russian regions away from the capital.
- 2 Decisive measures by the state, the scientific community, development institutions and business to improve education of specialists and raise the level of research conducted there.
- 3 Correction of provincial bias, making basic support resources available to innovators everywhere.
- 4 Creation of powerful R&D support hubs in the federal regions.
- 5 Greater access for the regions' enterprising innovators to support instruments to eliminate the "territorial innovation discrimination".

Concluding remarks

“ It’s time to orient the economy to innovation. This is a key objective of our entire economic policy”, said President of the Russian Federation V. V. Putin during the April 25, 2013 “Online with Vladimir Putin” event. Significant expansion of the economy’s innovations sector remains one of the highest priorities for the country’s leadership.

Preliminary results of the first stage of the Strategy for Innovative Development of the Russian Federation for the period until the year 2020 and other innovations advances of the last few years make it clear that much has been achieved. Foundation for an innovations-based, socially-oriented economy has been laid. Some instruments such as a support infrastructure for innovations with its ecosystem are already effectively functioning.

Of course, some obstacles on the way to the innovations-based model remain. The young innovations segment of the Russian economy suffers from stage and sector bias. Market size is another important issue: unfortunately, domestic innovations business (goods and services) still makes up only 15% of the GDP whereas in developed countries it amounts to 30 and more percent. Still, the situation has definitely improved. Russia can and must move from laying a foundation of an innovations sector to its quick development, correction and balancing. The next step is to multiply the contribution of the innovations sector to Russia’s GDP.

Ongoing signs of crisis in the world economy and the threat of the economic recession confirm and add urgency to the theses of the Strategy. The relevance of global challenges to our country is

mounting quickly.

Faster change to an innovations-based economy is the only way for Russia to shake off its dependence on wobbling traditional markets and secure a place among the most advanced nations that set major trends of global development.

Russia’s government can rely for this on the active support from a growing community of innovators. The first public analytical report on the implementation of the Strategy shows that participants in the innovations-based economy now taking shape sincerely support the Strategy’s goals and have no desire to wait for a cozy, ready-made innovations market to be delivered to them by the state. Russian innovators — students, teachers, scientists, technology entrepreneurs, business angels, investors — have begun to feel themselves the main actors of the innovative turn. This is why opinions and suggestions of players on the technology innovations market are so important to success.

Attaining the Strategy’s goals has become an important objective not only for the government and development institutions, but for a significant portion of the society. Without doubt, prosperity for the people and assuring the country’s geopolitical standing among the leaders shaping the global political agenda have become integral elements of the master narrative of modern Russia.

Russia’s innovators still have much to accomplish, and the work awaiting them will be both difficult and engaging. Let us wish them good luck and successful ventures!

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