

УДК 332.1

Strategy of Siberia's Development: from Resource Economy to Innovation Economy

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Received 3.12.2010, received in revised form 10.12.2010, accepted 17.12.2010

The article presents a genesis of the notion "Siberia" and defines two main characteristics of a region with a resource economy: (1) outflow of capital and lag in living standards of the population, (2) degradation of the economy without its timely diversification. The article also describes channels of capital export from Siberia and defines strategic objectives for the development of Siberia's economy in line with Russia's development strategy. It points out specific features and issues of the establishment of Russian and, in particular, Siberian innovative economy.

Keywords: strategy, goals and objectives, Russia, Siberia, innovations, natural resources, fundamental science.

Genesis of Perceptions of Siberia (see Fig. 1).

A rather intensive exploration of Siberia by the East Slavs began at the end of the 16th century, 100 years before Yermak's campaign. Up to the end of the 19th century Siberia meant all the territory from the Urals to the Pacific Ocean (this comprehension of Siberia notion is registered in the Brockhaus and Efron Encyclopedic Dictionary published in 1890-1907). However, this is the way Siberia is still understood in the most Western countries today.

In the second half of the 19th century, the notion of the Far East started to take shape. In 1689 the Treaty of Nerchinsk (Nerchinsk at the time was the capital of all Transbaikalia, up to the Pacific Ocean) brought the border with China from the Amur River's streamhead, at

the junction of the Shilka River with the Argun River, to the North and North-East towards the Shantar Islands (400 km north-westward of the Amur River's mouth). The border returned to the present state in 1858 with the Treaty of Aigun (Aigun – Aihui in the Chinese pronunciation – an ancient part of Heihe, a Chinese city opposite to Blagoveshchensk), which to the present day the Chinese call "unequal" (in a bad translation, in the original – illegitimate). That year Khabarovsk was founded, two years later – Vladivostok. In 1867 Alaska was sold (for 7.2 million dollars, with the annual budget expenditure of Russia being 200 million), which together with the Aleutian Islands also belonged to Siberia then. That was done in order not to "disperse" but to concentrate on protecting Russian interests in the Far East.

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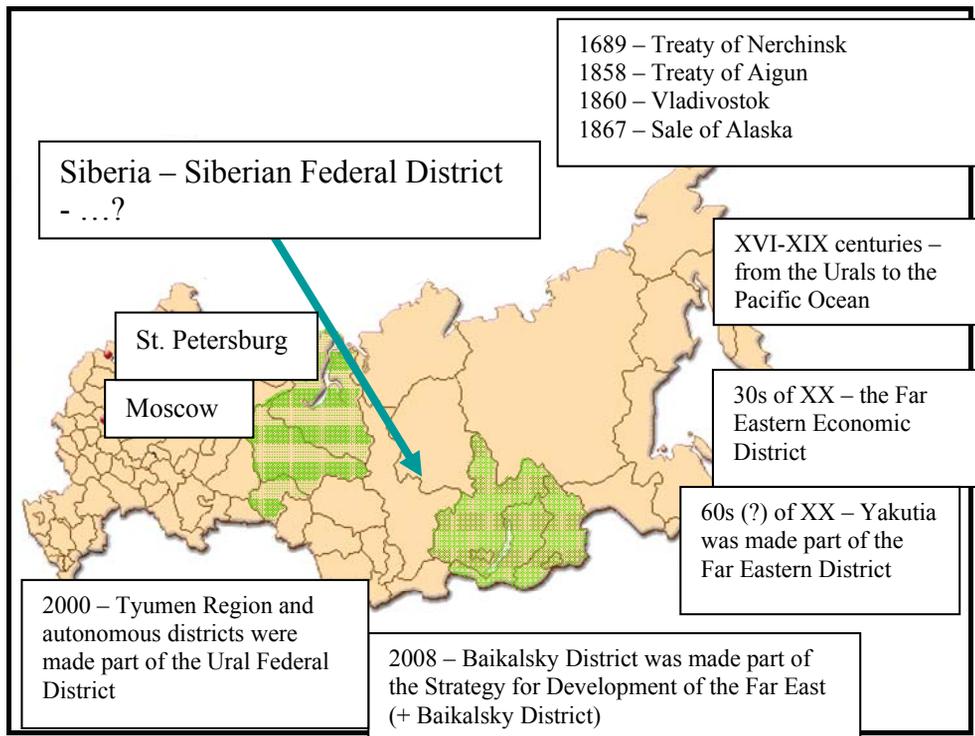


Fig. 1. Genesis of the notion “Siberia”

Only in the 1930s the Far Eastern Economic Region was created; it included the present-day Chukotskiy Autonomous District, Kamchatskiy Krai, Magadanskaya, Sakhalinskaya and Amurskaya Oblast, Khabarovskiy and Primorskiy Krai. In the early 1960s Yakutia was “transferred” from Siberia to the Far East. In 1957, when the Siberia Department of the USSR Academy of Sciences was being organised, Yakutia was still part of Siberia and fell under (and still remains there) the authority of the Siberia Department (in the 90s a national Academy of Sciences was established, but it failed to acquire any significant authority). The situation did not change with the creation of the Far East Department of RAS in 1987.

In 2000 Federal Districts were introduced and Tyumenskaya Oblast together with Khanty-Mansiyskiy (oil) and Yamalo-Nenetskiy (gas) Autonomous Districts were included in the Urals Federal District. Siberia “shrank” to the

Siberian Federal District. However, the “attack” on Siberia was continued. Already in the mid-1990s Transbaikalia, consisting of Buryatia and Chitinskaya Oblast, were included in the Programme of Social and Economic Development of the Far East. In 2008 all the Baikal region, which apart from the Republic of Buryatia and Transbaikalia Krai comprises Irkutskaya Oblast, was included in the Far Eastern Strategy of Development. At the same time, the leading officials of the Ministry of Regional Development said that the Baikal Region was not part of the Siberia Strategy anymore.

Nevertheless, in the strategic planning by the Institute of Economics and Organisation of Industrial Production of the Siberia Department of RAS, Tyumenskaya Oblast, including the autonomous districts, and – on some issues – the southern regions of the Republic of Saha (Yakutia), were and are regarded as Siberia.

Resource Character of Siberia's Economy

A resource economy is based on the exploitation of natural resources, that is to say that a substantial part of it (up to two thirds) directly or indirectly deals with extraction, primary processing and transportation of natural resources. This is an economy of a colonial type that has two specific characteristics (with rare exception demonstrated by certain Arab oil-producing countries).

1. The level of development of the territories with this type of economy and the standards of living of the population of these territories are inadequate (much lower) to their economic potential.

The fact of the matter is that the export surplus of such territories is positive and the excessively huge. According to the balance of payment conditions that means that the capital in relatively huge proportions is exported from these territories (or is concentrated in gold and foreign currency reserves in sovereign territories). In other words, financial resources produced here are not used for social and economic development and improvement of these territories.

The amount of financial resources being exported from Siberia is comparable to the official gross regional product of the region. This estimate was obtained the following way.

By a calculation made in accordance with multi-(inter)regional models of the NIS and Russia, the system of regions is brought to an economic equilibrium by Walras with zero trade balance by the regions, i.e. to a condition of equal interregional exchange. As a result, target indicators for Siberia are increased by 1.8-2 times.

The main elements of capital export from Siberia are the following:

a. Export duties. They are fully paid to the federal budget. The federal budget revenues are

by 25-30 % formed by duties on exported primary resources.

b. Transfer prices. Extractive units of vertically integrated companies located in Siberia sell their product at "laughable" (transfer) prices to the next branches of companies located outside Siberia that are part of the vertical integration chain. That is, the lion's share of added value is exported from Siberia.

c. Registration. A large part of taxes, bypassing the Tax Code, is paid to the budget of the region where the company is registered. For big companies developing the natural resources of Siberia most often that is the budget of Moscow or St. Petersburg. And an offshore company doesn't pay taxes almost at all. Though for Siberia it is all the same and does not make a difference.

2. A territory with this economy type (resource, colonial) inevitably degrades: as resources deplete, the economic activity is phased down and the region turns into a depressed one. Of course, the issues of resources development optimization and nature management improvement need to be addressed, but one should understand clearly that without timely diversification such territories are doomed.

The present-day developed world has many examples of successful diversification and transit to a post-industrial economy. Former resource regions, having gone through a tough period of depression, are turning or have already turned into territories whose economy is based on culture, art, sports, tourism and recreation and logistics. These types of activities, which were seen as a load upon an economy in the industrial age, are becoming the main factor of economic growth and social-economic development.

For Siberia this issue is not yet so urgent. Its resource potential is enormous and it is important to use it properly, first of all, in the interests of Russia and Siberia itself as an integral (as one wants to think of it) part of Russia. Over the next

15-20 years it is necessary to build the upper levels of the economy on the base of its resource potential, to implement the significant science, technology and innovation potential, and to raise the level and quality of living of the population.

This is a question of preserving the country's territorial integrity.

It is necessary to understand that Russia's economy as a whole is also of a resource character.

Strategic Goals for Russia For Upcoming 25-30 Years

In the National Security Strategy of the Russian Federation until 2020, approved by Decree of the President of the RF # 537 as of May 12, 2009, point 21 states: "The national interests of the Russian Federation in the long term consist of the following: ...ensuring the solidity of the constitutional system, territorial integrity, and sovereignty of the Russian Federation; transforming the Russian Federation into a world power, whose activity is directed at supporting the strategic stability and mutually beneficial partner relationships within the multi-polar world". We should agree with this wording of the strategic goals. More precisely they can be defined as the following:

1. Ensuring the territorial integrity of the country.

This goal is highly relevant as the accumulated potential of Russia's disintegration is oppressively high. This potential is defined by several factors:

a. Territorial differentiation (as regards constituent entities of the federation) of macro indices of the economic development level and living standards per capita is several times as high (in accordance with decile variation coefficient) as in most countries of the world.

b. The transport infrastructure is underdeveloped, with transportation tariffs

being extremely high, especially on internal routes which do not pass through terminals of the capital. Russia's internal integration transport and economic ties, especially "short" ones, are much weaker than they should be.

The line of potential split in Russia now goes along the boarder between East Siberia and the Far East. Crossing the line from the West to the East, a radical reorientation of the direction of economic ties takes place: from the western intra-Russian orientation to the eastern and south-eastern external-economic orientation (Japan, Korea, China, USA). This line tends to drift westward.

c. Imperfection, underdevelopment, inconsistency of the Russian federalism allows many researches to characterize it as "declarative", "nominal", "fictitious" and so on. The budgetary burden is quite unevenly distributed among the levels of the budgetary system. The regional level is extremely overburdened. During the "fat" years the federal level accumulated a giant surplus, whereas regional budgets ran on the verge of deficit, sometimes crossing that line. There are cases when the relation between the centre and the regions could be defined as discriminatory and colonial.

Up to a half of financial resources that come from Siberia, as mentioned before, are concentrated without any compensation in the federal budget.

We can just express satisfaction with the fact that no strong forces have appeared so far to seek to realize the disintegration potential. However, it is impossible not to see that such forces, rather powerful, are becoming active outside Russia, especially in certain countries of Asia-Pacific Region.

It is known that back in the beginning of the previous century Woodrow Wilson, the 28th President of the USA, expressed regret that "the main prize in the human history – Siberia" went

to Russia. Zbigniew Brzezinski, famous political scientist, forecasted that Russia as a state would cease to exist by 2012. According to him, it would most likely break into 6-8 states. Not so long ago it was widely discussed that the former US Secretary of State Madeleine Albright allegedly believes that Russia does not deserve to possess the Siberian resources. However, this information was not confirmed afterwards.

The government of Russia and Russian opinion-makers also tend to create a negative attitude towards Siberia lately. This is why, for example, research is conducted proving that "Siberia is a curse for Russia".

Talks about a possibility to sell Siberia or its part (as Alaska at one time) constantly appear in the foreign mass media. Even prices are mentioned. In the early 1990s a scandal was sparked by the initiative of economist James Meade, who suggested that the USA shall buy out all the land to the East from the Yenisei River and create seven new American States there.

There is a real threat of China's demographic expansion. Density of the population in the border zone along the Amur River and the Ussuri River on China's side is several times as high as that on the Russian side. Disturbing are the results of the recent border demarcation between Russia and China, in accordance with which a part of territory near Khabarovsk was given away to China. According to certain information, Chinese enclaves have emerged (and continue expanding) in particular Russian cities of the Far East and they practically fall out of the Russian jurisdiction.

2. Russia's entry into the ranks of world economic leaders

This is a goal that is hard to achieve as it is impossible to become a world leader only with oil, gas and nuclear- and thermonuclear-powered ballistic missiles, and the starting conditions are

extremely poor (of course, they are better now than in 1920s, but not much).

Russia's GDP per capita is at an average world level, 3-4 times as low as world leaders'; in terms of the human capital quality it is at the bottom of the countries list (in terms of life expectancy it ranks 134th; death rates of young and adult men are comparable to those of the USSR during the WWII); in terms of the GDP energy intensity it lags behind the leaders by 2 or more times, which can not be explained by severe climatic conditions only; in terms of innovation and labor efficiency in some industries, the indicators are tens and even hundreds of times lower.

At the same time, in terms of levels of corruption, social stratification (by income, property status and standards of living), suicide rate, number of plane crashes and road traffic accidents, bureaucracy etc., Russia is on the top of the list.

As far as living and urban development standards are concerned, many Russian towns have stayed not even in the 20th century, but in the 19th century (though on the top of a "hut" there can be a satellite antenna). Roads are worn down by heavy trucks, as they cause more damage to earth roads than animal transport. One fifth of settlements don't have a telephone line.

Objectives to Achieve the Strategic Goals

1. First of all we have to recognize as a prime objective something, which is normally regarded as a tool, as a means of achieving objectives. That is about improving legislation. This should be done because of the neglect, sometimes deliberate, of this sphere.

"Our legislation is perfectly imperfect", as a speaker said at one of the conferences on perspectives of the Russian economy development.

Especially pressing is the issue of a fundamental transformation of the system of laws and regulations that shall hinder “melting” of authorities and businesses. It seems that the more they speak about it the worse the situation is. Here is just one example. What is it: corruption, monopolism, or cartels’ conspiracy – that while the prices for primary fuel, raw materials were falling in 2009, tariffs for the services provided by state monopolies continued to rise? Moreover, this increase was supported by the leadership of the country.

Of equal importance is the development and improvement of legislation on federalism, environmental management, taxation and budgeting. In numerous cases the legislation acts and law codes overlap, contain gaps and contradictions. Often they bring about a result that is directly opposite to the desired one. This hampers economic growth, innovation, the development of small and medium enterprises; social stratification increases along with territorial differentiation of living standards and economic development; this also encourages predatory exploitation of natural resources.

At the same time it is necessary to understand that even small changes of wording in these laws and acts “cost” billions of dollars.

2. Large-scale technological transformation of the economy and social services providing for the emergence in Russia of brand new goods and services (including in education and healthcare) and also allowing to reach the global levels of labor, resource, energy and capital intensity of production.

3. A fundamental modernization of secondary and higher professional education, which would satisfy the demand in the economy and social sphere for highly skilled managers, engineers, technicians, workers, meeting the requirements of dynamic, effective, innovative development of a modern society.

4. A priority development of fundamental science, creating a sound foundation for national security (including through advanced weapons systems), guaranteeing Russian control over 20-25 % of macro-technologies and macro-products and possession of critical technologies for most kinds of activities. In the long run up to 15-20 % of Nobel prize winners will be Russian citizens.

5. The creation of a highly efficient innovation system, transforming scientific knowledge into new technologies and products, satisfying 15-25 % of global demand for new science-driven technologies and products.

6. Economic growth, leading to the doubling of the GDP every ten years for the next two or three decades, based on high-tech, high-level processing of natural resources and consumer-oriented industries.

7. Two- or threefold (in accordance with the decile coefficient) reduction of social and territorial differentiation of living standards.

8. Entry into the top-ten states in terms of economic development and living standards indicators (and into the top quartile over 10-15 years).

9. Population growth in Russia (over 25-30 years) to 160-170 million people, where 50-75 % of this growth shall be achieved through immigration. At the same time, the population of the Asian part of Russia should grow to 35-40 million people.

Means, Mechanisms and Tools for Achieving the Objectives

1. An industrial policy, which will define priorities for regions and industry sectors and truly stimulate economic growth, technological modernization, stimulating innovative industries directed at the national innovative system, transition to modern forms of industrial organization.

The outlines of such a policy are not hard to define based on the Russian and foreign experience. But this would contradict the principles applied for years by the Ministry of Finance and some other government agencies.

2. A tax and budget mechanism truly leveling out the “exorbitant” income and property status inequalities, the tremendous territorial differentiation of budget spending and standards of living across the regions.

Such an industrial policy and tax and budget mechanism should be elaborated, adopted and, most importantly, firmly implemented.

Main Priorities of the State Regional Policy

1. The Far East (The Far Eastern Federal District).

2. Siberia (Siberian Federal District, including, for certain issues, the Tumenskaya Oblast, the autonomous districts in the North of the Western Siberia and the South of Yakutia).

These macroregions, surrendered to market forces, have no long-term development prospects (as part of Russia). At the same time the Siberian and Far Eastern Federal Districts rank last among the federal districts in terms of social and economic development.

On Innovations in Russia

The economies of developed countries are becoming more innovative. The science and technology sphere in these countries has been almost completely reoriented; it is now aimed at the requirements of economic growth, the latter being increasingly defined by the use of scientific and technological achievements (by 60-80 % in developed countries).

For Russia, the shift to an innovative development path is especially urgent. Most products produced in Russia for objective reasons of natural and climatic character can not

be competitive on the world market. The world economy only needs its natural resources (the “storehouse”) and, under certain conditions, its geographical location (the “bridge” between continents). Only a sharp increase of the share of intellectual labour in the price of the final product can counter the negative factors.

Nevertheless, the demand for innovations in Russia, and especially in Siberia, is dismally small. On the other hand, Russian science is increasingly becoming an intellectual appendage of the global innovation system, acting as a supplier of “innovation ore”.

So far the trends in this field are not satisfactory. Once again there is the impression, that the more is said about the necessity of innovative development, the worse the situation becomes. The latest initiatives of the federal government in this sphere (Skolkovo, emphasis on university science) seem to be ill-devised, if not outright mistaken.

Serious innovation begins with fundamental science (not all innovation has science as its source). In Russia world-class fundamental science still exists (first of all in the RAS), especially in areas dealing with the military-industrial complex in one way or another. The attitude of the world community to this matter is another issue.

The formation process of the Russian science took place considerably later than in the leading countries. Only by the mid-19th century had world-level scientific schools emerged in Russia. Russian scientists didn't make it to the “egghead” club (and they still haven't become full members), and Russian contribution to world science has been, in our view, quite underappreciated.

Family names start with capital letters. Paradoxically, one should do a great service to humanity to have one's last name written with small letters. There are just several dozens of people in history who have acquired this

privilege: colt, nagan, volt, ampere, watt, ohm and others. These are Englishmen, Frenchmen, Germans, Italians and, of course, Americans. There are no Russians among them. This is in fact the assessment by the international community of the Russian contribution to world science. Probably, just two Russian names come closest to being world brands: Kalashnikov and Smirnov. There is also mendelevium, the 101st element of the periodic table (efforts to name the 104th element kurchatovium did not succeed, it became rezerfordium).

In the meantime, there is no lack of examples of world-class discoveries and innovations of Russian origin: the steam engine (Polzunov), radio (Popov), helicopters (Sikorsky), television (Zvorikin), “input-output” analysis (Leontiev) and others.

Another example can be mentioned in this context. The name of the American company REDA, a leading global producer of submersible pumping equipment, the foundation of modern oil production, stands for “Russian Electrical Dynamo of Arutunoff”. The matter is that in the beginning of the past century Russian engineer Arutunov invented a submersible electric pump for oil extraction. Namely, he introduced some fundamental changes to its design, which increased its productivity and service life manyfold. Russia could have become a leader in submersible pumping technology, but his homeland did not accept his ideas, and in the early 1920s Arutunov left first for Austria and then for the USA. There his designs came in quite handy. Ever since nothing more efficient for oil pumping from underground layers has been invented. Now even in Russia three quarters of oil is produced using such pumps¹.

¹ A modern submersible electrocentrifugal oil pump is a crossbar several dozen meters high operating in a well 1,5-2,5 km deep. Its sections rotate in synch at about 200 revolutions per minute.

The young company “Novomet” from Perm continued the submersible pump story. It was able to overcome the technological backwardness of Russian oil equipment. With its know-how it made a global bestseller out of the old invention of engineer Arutunov. Established in 1991 by engineers of the Republican Engineering and Technical Center of Powder Metallurgy, “Novomet” sets the global quality standard in many segments of submersible pump production. “Our niche is there, where oil extraction is difficult”.

Here is another example.

IPG Photonics, registered in Oxford, USA, was established in 1991 in Fryazino near Moscow, where its mother company NTO “IRE-Polus” still resides. Despite the transnational character of the business, 80 % of the IPG employees are Russians. The control over the company and its patents are in the hands of Russian scientists and engineers.

IPG Photonics specializes in medium- and high-power lasers, the global market for which, including different mechanisms and systems where they are used, amounts to 10 billion USD. Although the biggest Western companies operate in this market, it was this Russian company that was able to bring about— without state support, investment or resources – a revolution, creating in the early 1990s for the first time optical fiber lasers with a power of up to tens, hundreds, thousands and tens of thousands Watt. Since the mid-1990s in many countries research in this area has acquired the status of actively financed national programmes. Yet IPG Photonics, despite its incomparably smaller human and financial resources, was able to far outpace its competitors. It has maintained the lead up to now.

There are also success stories in the Siberian science and innovation sphere.

However, to speak seriously about the innovative character of our economy, there

should be not dozens, as there are now, but tens of thousands of examples like these, and correspondingly, there should be not hundreds, but hundreds of thousands of startups.

A leap in unpaid Russian export of fundamental ideas for future innovations took place after 1917. The reasons are clear. It is easy to explain why a similar process got started two decades ago. It is still ongoing because of Russian weakness in the innovation sphere: elements of innovation infrastructure, commercialisation mechanisms are being set up in Russia, but they still do not constitute an effective system.

Generating a stream of potentially important innovative ideas, Russian science does not supply the Russian economy with Russian innovation on any meaningful scale. Still, on the other hand, there is no noticeable demand in the Russian economy for innovation in general and for Russian in particular.

Nevertheless, a positive trend is evident.

Depressing is another thing: it seems that in certain government circles the objective has been

set to “bleed white” the fundamental science (science is not only greatly underfinanced, but also “pushed” into the same category as cattle farmers and diggers – a “one size fits all” approach), to simplify fundamental education (by replacing the school of knowledge concept with that of a school of skills). If they succeed, the country will only have one way to go – implement the pessimistic scenario.

The Innovative Character of the Siberian Development Strategy

The Strategy of social and economic development of Siberia lays out several measures aimed at a significant strengthening of the innovative character of the economy. The possible centers for the crystallization of innovation clusters are shown in Fig. 2. A forecast for the parameters characterising the innovative sphere is presented in Table 1.

The Strategy foresees the solution of a number of serious problems, as the starting conditions in Siberia are not favourable, even compared to the average Russian level.

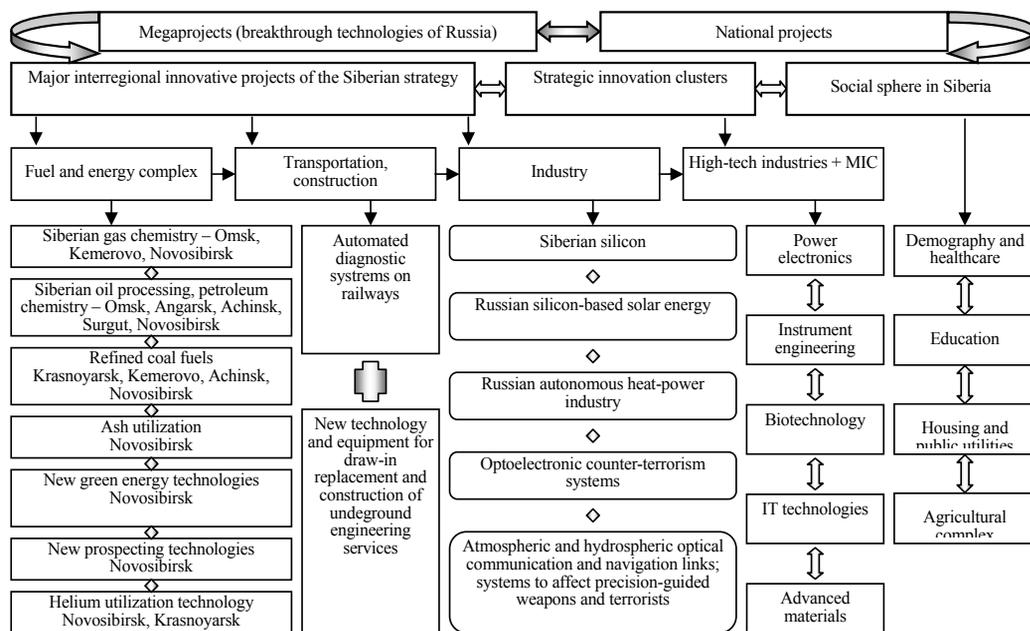


Fig. 2. Major innovation projects in Siberia as potential centers for the formation of clusters

Table 1. Target indicators for the innovation sector in Siberia

Indicators	Currently	2009-2010	2011-2015	2016-2020	2021-2030
Number of employees engaged in R&D	58650	58000	59000	61000	62500
Share of young scientists (aged under 39), %	18	20	25	20	30-35
Number of international research centers in Siberia	12	13	15	20-23	25-30
Share of scientific journals with an interational ranking, % of the total number of such journals in Russia	< 1	2	5	7	10
Number of patents issued	2815	3200	3600	4200	7200
Number of production technologies developed, % of the total number of technologies developed in Russia	11	13	15	18	25
Foreign trade turnover (technology and technical services export and import) in the Siberian Federal District, % of the national index	6,6	7,2	9	12	14
Share of research organisations and higher-education institutions with Internet access, %	33	40	55	70	100
Share of factories carrying out innovation activity, %	6,9	7-9	10-15	20-25	30-35
Number of students per 10.000 population	480	485	493	500	520
Share of innovative products in total production, %	4	3-4	5-8	10-15	20-25
R&D share in industrial product price, %	Менее 1	1	1 - 2	2-4	4-5
High-tech share in the gross regional product, %	4-5	7-9	10-13	14-17	20-25

The traditional industries of Siberia (and of Russia too) are based on the 3rd and 4th technological generations. Although certain plants of the processing industry use (to a limited extent) equipment and technology of the 5th and 6th generations, for instance, laser equipment and technology, accelerating equipment, cathode-ray and photochemical technologies, biotechnologies, catalytic technologies, advanced coal processing and coal chemistry technologies, the production of nonmetallic materials, information technologies, etc.

In 2007 the share of science-driven machine industry sub-sectors (production of machinery and equipment, production of electrical equipment, of electronic and optical equipment, production of transport vehicles and equipment) in the processing industry of Siberia was marginal – 11,

4 % (in Russia – 20,2 %). For industry as a whole the share of science-driven sectors accounts for 8 % in Siberia (in Russia – 13 %, in the European Union – 16 %).

The share of innovatively active plants in the Siberian Federal District in 2006 constituted 6,9 % of the total number of industries and organizations (Russia – 8,6 %, Ireland – 75 %, Canada, Germany, Australia – above 60 %, Mexico – 46 %, Hungary – 28 %), and the share of innovative products (goods and services) – 1,5 % (Russia – 4,5 %). R&D expenditure in the industrial sector accounts for less than 1 % when it comes to the sales volume.

Innovative processes in the real economy of Siberia (factory innovative activity, production of new goods and number of advanced

technologies used, technological exchange) are developing at a slower pace than in the rest of the country.

The implementation of the innovation strategy is of vital importance for Russia and Siberia in particular.

Стратегия развития Сибири: от ресурсной экономики к инновационной

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В статье представлен генезис понятия «Сибирь», определены две основные характеристики региона с ресурсной экономикой: (1) вывоз капитала и отставание уровня жизни населения, (2) деградация экономики без своевременной ее диверсификации. Раскрыты пути вывоза капитала из Сибири. Сформулированы стратегические задачи развития экономики Сибири, соответствующие стратегии развития России. Выявлены специфические особенности и проблемы становления инновационного уклада российской и, в частности, сибирской экономики.

Ключевые слова: стратегия, цели и задачи, Россия, Сибирь, инновации, природные ресурсы, фундаментальная наука.
