People's health more important than international financial center

The financial crisis is a consequence of the 2003-2008 wrong decisions, and a possibility of new mistakes is not to be disregarded, says ex-senator and head of the SuperOx innovative company Andrey Vavilov. He does not gamble in the stock market, avoids real estate investing and conducts research on superconductivity most of the time. Mr. Vavilov tells Infox.ru about his life and work after the resignation from the Federation Council.

— You are heavily engaged in research on high-temperature superconductivity. Why do you consider this area promising?

— Following the sale of the Severnaya Neft oil company in 2003 I decided to set up the Human Capital Foundation. As a former researcher, I am aware of difficulties that young scientists face when promoting their ideas. Since research and development projects are characterized by high risks at early stages, applying standard economic efficiency criteria, especially in Russia where business risks are high, means killing such projects from the start. The foundation's main objective is to promote developments that require little time and funding to achieve a result – no matter positive or negative. The foundation selected projects using scientific, not economic, criteria, for which a multi-stage unbiased assessment system was established. If approved, a project could claim funding as a venture and when scientific risks lowered to an acceptable level it would become attractive as a business idea to which economic criteria would be applied. The foundation bridged the gap between ideas and their practical implementation. Initially, we supported projects in three research areas including physics & power engineering, information technology and applied economics – the latter is related to my past research work with the Central Economics and Mathematics Institute of the Russian Academy of Sciences. Perhaps, space technology is the only area that the foundation did not deal with – because small grants are not helpful for this sort of research.

Superconductivity was one of the projects that our foundation found interesting. A correspondent member of the Academy of Science, Nikolay Alekseevich Chernoplekov, may he rest in peace, was one of the leading superconductivity experts. Our cooperation had a strong impact on my attitude towards this topic. Nikolay Alekseevich told me much about the research on and prospects for superconductors and explained why superconductivity had a bright future – in terms of both scientific and economic value. He would persuade me that it was a promising area of research and at a certain stage I thought it was worth doing it.

Clearly, superconductivity is a broad field for research with many fundamental and applied aspects that need investigating. At present, various types of superconductors are known, and it is likely that in future new superconducting materials will be discovered. Perhaps, it will not happen soon and new fundamental knowledge will be required for that. For the time being, we decided to concentrate on fundamentals that have been already explored.

— Did the foundation give priority to applied research and projects stipulating potential economic return when approving grants?
— Applied research projects were preferred, but we never focused on assessing their economic feasibility. In fact, that was the principle on which the foundation's activities were based: short-term economic effect requirements should not hamper the development of scientific thought. At the same time, we well understand that small grants are not very helpful in basic research that often requires large-scale funding. However, in cases when only a small impulse is needed this financing might be vital. It could help find answers to questions that nobody yet asked or produce a result that would translate some research from theory to practice.

— Do you patent all your achievements?
— Of course, we patent everything that is finished.

— How many patents do you currently hold?
— SuperOx, a company that has been founded recently to handle the superconductivity project, holds few patents, but patent obtaining is an ongoing process. Also, there are some legal nuances – having a patent is not always cost-effective. But this is another issue, and we are working on it.

Returning to superconductivity, low-temperature superconductors are used in a wide range of applications, for instance, in powerful magnets including those for medical tomographs. Later high-temperature superconductors were discovered. What are their advantages? Low-temperature superconductivity occurs in some materials when they are cooled to liquid helium temperature of 4.2 K, keeping temperature that low is highly energy- and money-consuming. Money saved from zero electrical resistance does not cover the expenses for achieving this temperature. Some devices like the famous Large Hadron Collider cannot work without low-temperature superconductors. Five nuclear power stations and several thermal power plants are needed to run it using ordinary electromagnets. Superconducting magnets help considerably reduce energy consumption and expenses for experiment handling.

By the time we started discussing the investment question we learnt that the American Superconductor had launched pilot production of products that we intended to make. These are so-called second generation high-temperature superconductors (operating when cooled by liquid nitrogen). For your information: the first-generation high-temperature superconductors are 2/3 silver (the technology assumes encasing the superconductor in silver), while the second-generation superconductors do not comprise expensive or rare components, therefore they have much room for cost reduction.

We were initially set to make a product similar to what American Superconductor manufactured, but we meant to cheapen the technology rather than to simply imitate it. To do so we had to change it completely. Our technology assumes chemical, not physical, deposition. Briefly, the difference is as follows. Physical deposition requires fine vacuum and high energy input. A layer of substance must be transferred from one item – the target – to another one – the substrate. Much energy is spent for maintaining deep vacuum and substance deposition. Also, the process must be carried out at a particular temperature and speed ensuring both high product quality and high efficiency. The only way to bring down the cost of deep-vacuum technology is to step

up the production. We use different methods – chemical deposition whereby thin-film functional covers is transferred by means of metal compounds that easily come to vapor under certain conditions. Potentially, these methods are far more cost-effective than physical methods presently used for manufacture of the second-generation superconductors. By the way, there are other teams globally who conduct similar research.

We have been thoughtfully and profoundly working on this project for four years, we made prototypes and we are underway to put our superconductors into series production, i.e. launch a pilot production line with sequential technological stages are carried out on a single site at a suitable pace. It goes without saying, in future each production stage will be enhanced as improvements are vital for ensuring high quality of this sophisticated, science-intensive product. We believe that when put into mass production, superconducting tapes will be used in various pilot superconducting products such as cables, current limiters, engines and generators, magnets and a number of other nice and useful devices.

Of course, it is a totally new technological lifestyle to which the humankind is gradually shifting. The previous lifestyle relied on information technology, while the new one is associated with power engineering. I remember the time when fax machines were the only means to send documents over a distance. Today you can do it with the help of your smartphone. The new setup suggests a new lifestyle.

Capacities of materials used in aircraft and the potential of the existing technology of vehicle motion have been exhausted. The same is observed in the power engineering area – we are on the verge of entering a new era. Presently, power engineering infrastructure is an improved version of old technology. However, we are peeping into future already.

You may exert yourself doing it – just to receive a zero result

— Russian president Dmitry Medvedev named five main areas to be upgraded. Do you agree with his priority ranking? Would you remove anything from or add anything to this list?

— I do not think there are any false objectives on this list. All enlisted areas are important. First, for each of them there is a profound fundamental background. Second, results might be achieved quickly in each area. Organizing a modernization process is a big challenge for the state and the business community. Time will show, whether it will prove successful.

— What are the largest difficulties associated with modernization and at what stage can they emerge?

— In our country much time is needed for project implementation. Unfortunately, the state does not provide sufficient aid to this process. Innovative activities can be concentrated in a single place, the state could allocate special resources such as funds, human resources, and administrative control can be strengthened. It would be great to successfully develop these processes in several areas.

In American and European countries that are more open to scientific achievements the government takes more responsibility for modernization. If it commits to promote a certain area, absolutely equal support will be given to all. The government pays for alternative energy while businesses incorporate it in their calculation at the decision-making stage. In our country we often have to put much extra effort to receive such support.

We saw it when we launched the SuperOx project. Fortunately, we only have customized locally made production equipment. But we had to import part of control equipment, and it was impossible to get customs clearance for the equipment as part of the authorized capital. You have to pay a customs duty first and then prove that your equipment is a contribution in R&D. You may exert yourself doing it – just to receive a zero result. This is just one example out of many. I would not say that conditions in Russia are so tight that it is impossible to work here, but when you start the process you have to be prepared for such administrative challenges. In the US and Europe you don't have to prove that you are a researcher. They just take it for granted.

— Russia intends to create an analog of Silicon Valley in Skolkovo. Do you think it is an efficient way of supporting high technology development?

— I would say that people who initiated creation of Skolkovo are very bold. I like the idea. It is not clear whether the result will be positive, but the project must not be dropped. No one is going to close other research centers after Skolkovo is launched. Furthermore, research campuses are developing. I think that the idea of a new research center must receive approval.

— The Ministry of Economic Development said that high-temperature superconductivity is one of the project approved for implementation in the new center.

— I am glad to hear that, because to create a market for superconductor technologies people must be familiar with superconductivity. The superconductivity prospects are so wide that I am convinced that at this stage any project is relevant and will prove useful to consumers and the economy on the whole. Why is it good? The state will encourage companies to utilize superconductors in power engineering and other areas. I think it is a big breakthrough that the government pays attention to this area and encourages such projects. As other countries, Russia has pilot superconductor cable samples – one is 30 meters long, and the other one is 200 meters long. The 200-meter cable is made of the first-generation superconductors bought from Japan's Sumitomo. There are institutions and people in Russia who work on superconductivity and who actually made and tested the cable – in a large part owing to the state's attention to superconductivity. It was decided to use this cable in the operational city network, which is very encouraging. I think such cables and current limiters will see an exponential growth in future.

— You have said that you are close to launching serial production of high-temperature superconducting films. When is it expected to start?

— I think we will start a line with the capacity of 30 km a year by the end of 2010. This is a conservative projection.

— Is this the only project to be implemented?

— The foundation's objective is not to seek financial returns from all projects, although when I conceived it I assumed that projects that transfer to a venture stage would raise investments. We have other ideas, but to realize them, more players are needed including the state. For instance, we consider hydrogen production. The foundation is not able to do research in this area on its own. The involvement of state organizations and corporations is needed.

— Are you taking efforts exactly in this area? Are you looking for partners?

— As far as the hydrogen project is concerned, we are making economic estimates and before we make a proposal to anyone I want to have everything grounded and calculated. To do this, we have to conduct a holistic investigation into the technology. At this stage we only finance research into the technology that might prove efficient.

A medal for field development

— Tell us, please, about the Institute for Financial Studies that you head. What was it created for? Do you conduct research for state-owned organizations?

— Basically, it was founded to promote scientific knowledge in our country. As you know, in the USA there is an extensive network of industry lobbies who protect interests of manufacturers, such as grain producers association, metallurgist association and so on. Independent analytical centers, so called think tanks, lobby interests of the society on the whole. The IFS is one of Russia's think tanks. A couple of years ago, the IFS jointly with several other similar organizations set up the Association of Russian Economic Think Tanks that is engaged in economic analysis and promotion of its results in Russia.

We do not concentrate only on requests from the state or large corporations. Our objective is to explain what is going on in the economy and identify prospects for finance and the budget. Our focus is the country's economic conditions, but we also do theoretical economic researches, in particular, in auction theory.

By the way, Severnaya Neft, a company that I headed, took part in a bid to develop the Gamburtsev Val oilfield. We competed with many large oil companies possessing huge financial resources, but we won the bid because we proposed a development plan that was more efficient and profitable for the state.

Institute for Financial Studies

The Institute for Financial Studies was set up in 1996 as a non-partisan research center.

The IFS objective is to translate financial and economic research ideas from theory to the practice of state and corporate financial decision-making.

The main research areas include public debt management, pension system, fiscal policies, investment and innovation stimulating, to name but a few.

From 2002 the IFS has been a member of the Association of Russian Economic Think Tanks (ARETT).

The IFS closely cooperates with the world's leading centers: a joint project with the PennState University resulted in the foundation of the Center on Auctions, Procurements and Competition Policy (CAPCP) in 2006 and the Center for Research on International Financial and Energy Security (CRIFES) in 2008.

Importantly, we managed to implement that plan. In a short period of time (120 calendar days) we built 110 km of pipelines, four pump stations, developed the field, drilled new wells and reconstructed the old ones and as a result put the field into

commercial operation two years earlier than other bidders suggested. In the Soviet times we would have been awarded a medal for that.

It was a really ambitious and bold project that benefited to both our company and the state that started to receive gains from the field as scheduled.

From the theoretical point of view, auctions are more transparent and provide higher revenues. In reality, such factors as collusions and companies' inability to meet their obligations should be taken into account. In 2003 through 2008, gains from all oil and gas auctions totaled around $5 billion, while tax revenues from Severnaya Neft alone reached $6 billion at that time. It means that tax revenues play a far more important role than gains from auctions. In this regard contests (in fact, multidimensional auctions) might prove more efficient than English auctions. There is a joint project of the IFS and PennState University to study this aspect. We have collected a database on Russian auctions that can be downloaded from our website and used for research.

— How much Russia can obtain in future from privatization of state-owned corporations, in your opinion?

— As far as I understand, so far only the legal form of state corporations is being changed. No one is going to privatize them now. Frankly speaking, I do not see a great difference between state corporations and joint-stock companies in terms of financial effect.

— Market conditions apply to privatization, so any private investor can buy a stake in a state corporation.

— I like the idea of private investors. Any diversification – including diversification of investors – is positive, to my mind. However, so far, as far as I understand, it is all about changing the legal form.

— What is your attitude to the state's increasing stakes in corporations as an anti-crisis policy instrument? Do you think the state did right bailing out unprofitable companies or should it have let them go bankrupt?

— I think that oil prices played a key role in fighting the crisis. The prices rose to an acceptable level and this was an underlying factor. Price growth of $5, 10, and 20 per barrel hides both advantages and drawbacks of the state's efforts to overcome the crisis. I think that the absence of a system of responsibility for inefficient decisions is a serious drawback in fighting crises. Somebody took wrong decisions, made absolutely unrealistic inflow projections when growth peaked and then initiated absolutely inefficient projects. No one bore responsibility for those decisions. It is non-transparent and unclear. Of course, it is now hard to assess if the decisions were efficient.

For instance, I see that bailing out Russian automotive industry is socially important as it creates jobs. But what if there were any alternatives? If we allocated resources for construction of a new motor-car plant or a plant to manufacture new vehicle types or for launching a facility to manufacture railways from composite materials, perhaps it would have been a more efficient decision?

Sadly, high oil prices and lack of information on responsibility for wrong decisions camouflage the efficiency of actions undertaken by both the government and businesses.

— And what if we disregard oil prices?
— It is hard to disregard oil prices in our country.

— Could you compare the actions of Russia's government to efforts of other export-depending countries' governments?
— It is not right to make such a comparison. We always compare Russia to Europe or the US, but they face totally different problems. Their priorities include encouraging domestic demand to drive up the economy, supporting financial organizations and pushing up the demand for lending. To what other countries Russia can be compared? Arab countries seem not to have noticed the crisis, except an incident in the UAE when an emirate paid the bills of another one. Do you know what is positive about the Dubai default? They demonstrated a system of responsibility for wrong decisions – maybe not that transparent and not for all decisions, but I still think this is positive.

On the second wave

— Is there a risk that Russia and the rest of the world will face the second wave of crisis? What can trigger off another recession?
— We are presently observing the problems that emerged in the previous period – high oil price growth rates, credit boom and expansion of derivative financial instruments. Bubbles are present in all the areas. Financial companies were first to suffer – as a result, lending was cut. Other problems are also becoming evident, however, we perhaps do not see part of them yet. I think that what we observe in the global financial system is a consequence of 2003-2008 wrong decisions. Starting from 2008, collapsing markets revealed the problems, and a large number of wrong decisions were 'digested' in the course of that large-scale fall. It does not mean, however, that all the needed adjustments were made in the system and that we will not see a new crisis.

— What sectors of the Russian economy are most attractive for investors?
— It is hard to say, because practically all sectors currently face low competition. If you do not invest in stocks in an open market, but decide to start a business, much depends on formal rules, useful liaisons, and availability of some exclusive resources. Therefore, it is hard to say what area is the most underestimated. As for investing in stocks, I think that an emerging market like Russia will grow provided oil prices rise. I advocate diversification of investments, and the wider the diversification, the better.

Real estate is a promising sector in Russia. To a certain extent, it is a derivative from oil prices and given a large role of speculative demand, volatility and risks are implicit in this market. Amid a pyramidal demand growth, supply is lagging behind and there is an illusion that prices only can go up. However, as soon as the demand growth slows down, prices start dropping, players re-estimate their investments and opt for giving them up. The drop is not seen at once, but it is really drastic. From this point of view, real estate investing is more risky than, say, purchasing oil sector stocks.

— Do you gamble on the stock market?
— I don't. I keep my funds in a long-term diversified portfolio that is composed of various types of assets. If you want to lose your money, you'd better go to a casino.

— What problems of the Russian economy need immediate state interference?
— All of them are well-known. And there is only one way to solve them. Our state leaders, as high ranking officials, ought to use all their strengths and energy for the state concerns – taking them up close and personal. That is a recipe for success. No secret that in our country much depends on a personality. Therefore the outcomes depend on how strongly our administrative system tackles the task of modernization, corruption fighting and ensuring lawful court decisions.

Sergey Mironov asked to wait a little

— What would you change in the administrative reform? What do you think about the abolition of governor elections and three-part ministry division?
— I think that ministry division has not had any effect on their administrative activities. There is a rule suggesting that the more changes you make in something, the worse result you will have. I believe that good results can be achieved provided there are transparent long-term projected rules and a clear system of actions. If you change them in an effort to improve them, the situation will worsen, I think.

As for the abolition of elections, I am a proponent of the electoral system. I think that this abolition had a rather negative implication in the long run. Personally, I am for election restitution.

— You resigned from the Federation Council in March. What influenced your decision – did you get tired of politics or was it hard to balance business with politics?
— I was considering quitting politics from the last summer. I realized that I could no longer dedicate so much time to working with the Federation Council. Sergey Mironov asked me to wait a little, but I preferred to concentrate on innovative projects related to superconductivity. I could not combine research activities with legislative work any longer – it would have been unfair to the both occupations. I chose superconductivity because it was interesting and because it was an area where I could use my potential.

— Is it common to combine work at the Federation Council with running a business?
— Unfortunately, yes. Many senators do so.

This is what we lack now

— How would you rank SuperOx, the Human Capital Foundation, the Institute for Financial Studies and other projects in terms of your priorities?
— There are everyday tasks related to the management of my assets, I mean financial assets, first of all. Of course, I and the financial company that manages my financial assets spend much time on that. When you possess financial assets, risk management becomes the core activity.

— Do you have time for rest? How do you prefer to spend your free time?
—Surely, I do my best to find some time to spend with my family. My wife and my daughter like travelling, we go to the sea in summer and to the mountains in winter. My favorite winter sport is mountain ski, and I try to dedicate two or three weeks a year to my favorite activity.

— What countries did astonish you most in recent years?
— Iceland. It is a marvelous country which produces only green energy (25% is geothermal energy, and the rest is produced by hydroelectric power stations). There are practically no thermal power stations using fossil fuels like coal or black oil. Icelandic geothermal power stations look like futuristic sets from fantastic films. Geothermal power plants use steam that is released by the earth. Iceland is located on a ridge where two plates are pulling apart and lava comes close to the surface releasing large amounts of heat. A mixture of 170 degrees hot brine and steam is brought to the surface through wells. After being separated from the brine, steam is piped to a turbine to generate electricity. When you stand a few meters away from the well you can feel the earth shaking.

The 80 degrees hot water can be utilized directly for central heating. After heating households, the water is used to heat swimming pools. By the way, Iceland can boast of the largest number of swimming pools per capita in the world. Then the water is used to warm the lagoon and city beaches so that people could bathe when the air temperature is only 5 degrees. This is a real example of how alternative energy works and this is what astonished me most.

Human Capital Foundation
Human Capital Foundation was set up in April 2003 by Andrey Vavilov. The Board includes prominent Russian and British researchers.
The foundation mission is to provide help to Russia's economic development through support of Russian researcher and small technology-intensive businesses. The foundation supports individual researchers (including beginners) and leading research organizations (international research initiatives).
Founded seven years ago, the foundation has granted more than $5 million for the promotion of various research projects. As a result, dozens of articles and monographs have been published.
Individual grants are given to information technology projects (41% of all grants), physics (33%) and economics (26%).
Institutional grants are awarded mainly to projects in economics: the foundation has been long supporting the Russian Economics School and the PennState Economics Department research centers (USA).

— Do you have friends among supporters of market-friendly reforms? How often do you meet?
— We hold meetings with my former colleagues in various formats. Unfortunately, the last meeting was held on a sad occasion – the death of Yegor Gaidar. I consider him an outstanding historical personality, who during one year of being in office contributed in the building of a new economy more than all heads of the government in the following years. Gaidar did the most difficult part of the work – he launched the mechanism. I well remember it because I took part in implementation of the majority of decisions, in efforts that constituted a base for market economy, although many have a negative attitude to those efforts today.

In the 1990s a base was created for a shift from planned to market economy. I meet my former colleagues from time to time and we recollect that time with warm feelings. It was a time of changes when there was a need for decision makers. This is what could not have been avoided or delayed. It was the time of decision-making. Perhaps,

those decisions not always proved efficient, but without them things would have gone worse.

— My last question is a broad one. Does Russia have chances to become a superpower, an international financial center?

— I think that it is much more important to provide a decent and happy life for our people. This is what we lack now. Of course it is important to think about Russia emerging as an international financial center. But people's health is more important. People should enjoy top-quality medical care, receive decent salaries and wages, have good jobs and outlets for their labor and socio-political energy – they need to be happy. When we make our people happy, it will be easier to become a superpower. I may be mistaken, but I think that this is more important than ideas that have no relation to the life of the majority of people.