



# On the Way to Technological Breakthrough

*The forthcoming five-year period will mark a major breakthrough in the economic development of Belarus*

Belarus' technological development strategy for 2011-2015 is designed to promote the innovative development of the country, facilitate restructuring of the national economy, and create new science-intensive and high-tech enterprises. The strategy provides for enhancing the competitiveness of the economy by means of embracing cutting-edge technologies and introducing incentives to encourage innovation activity of businesses. Economy Minister of Belarus Nikolai Snopkov reveals the major points of the strategy in an interview with the Economy of Belarus Magazine.

**?** *The President of Belarus called a new technological strategy essential for the social and economic development of the country in the years to come. What goals does this strategy pursue?*

First of all, we are going to upgrade traditional industries to increase labor efficiency, cut down on energy and material consumption, turn out new types of products to reduce the country's reliance on imports and build up the export potential. Another important area of work is the development and manufacture of new generation products, implementation of cutting edge technologies enabling the production of competitive goods with a high value added.

The strategy provides for the development and implementation of domestic technologies and adoption of progressive foreign technologies of the fifth and sixth technological paradigms (information and communication technologies as well as biological technologies) and technical upgrade of traditional enterprises of the fourth paradigm.

The strategy focuses on creating an economic environment conducive to innovations and an

extended national innovation system.

The country's position on the global market of innovative products in the medium-term and long-term perspectives will hinge on its ability to generate scientific knowledge and devise modern-day technologies promoted by innovation-aggressive domestic enterprises. This is why it is crucial for the national economy to embrace new knowledge and technologies.

Therefore, the number one challenge of the forthcoming five-year period is to create conceptually new production facilities, enterprises and industries manufacturing high-tech export products.

To this end, we are determined to create a favorable business climate for domestic and foreign investors to carry out structural economic reforms, boost the output of competitive innovation products with a high value added and increase the earnings of businesses and households.

The structure of the Belarusian economy will be optimized in the following two ways:

Restructuring of traditional enterprises and their incorporation into holding companies; in-



clusion of R&D centers into these holding companies;

Creation of new high-tech enterprises and industries based on domestic technologies and strategic partnership with the world's leading companies.

The new legal framework provides for the commercialization of R&D products and protection of intellectual property rights.

**?** *The creation of innovation-friendly environment is viewed as an important factor contributing to the competitiveness of the national economy. What is your vision of this environment?*

Innovation-friendly environment means greater latitude for businesses, sound competition, focus on innovations, a significant number of small and medium-sized companies, creation of



big state-private companies. The economic liberalization, including optimization of tax legislation, is a major pre-condition for turning the national business into the innovation locomotive of the economy. The liberalization is expected to make innovations an essential condition for survival of companies amidst tough competition.

At present R&D products have limited use in the economy. This is why we need to come up with strong incentives to encourage innovations. This includes:

- the improvement of customs, administrative and other regulations that can influence a company's decision regarding innovations. Innovation-active companies should be given tax preferences;

- legalization of the mandatory transfer of royalty payments to R&D companies and individual scientists;

- freedom to determine the production volume and prices by companies who are implementing new technologies and developing import-substituting products;

- the right to use other payment mechanisms besides the tariff-based system to enhance labor productivity;

- tougher control over incentive payments (rewards, premiums, bonuses), social packages and non-financial recognition of employees and managers of the real economy sector via a wider use of collective labor agreements;

- enhancement of qualifications (training, re-training and advanced training);

- development of insurance system for innovation activities;

Hiring scientists and engineers from the CIS and non-CIS states to promptly meet the country's demand for highly-qualified specialists.

Top on the agenda is training professionals who can offer out-of-the-box solutions which implies the radical improvement of education and professional training across all the levels.

The market incentives for innovation activity should be based on the optimization of property relations and streamlining of functions of the relevant ministries and concerns. The latter should focus on the implementation of the state economic policy in the given industry. The direct control over enterprises should be minimized.

Management and privatization of state property and reformation of property relations in general should be targeted at creation of favorable environment for innovation activities of all the economic agents. Management and privatization of state property as part of the country's common economic policy aim to

*hout a large input of investment capital. What is planned to be done to boost the volume and quality of investments? What investment areas are of the top priority?*

Investments boosting technical development and competitiveness of the national economy in the long run should be based on concerted efforts of the state, business, science and civil society with the leading role played by the state as initiator and guarantor of agreements.

Therefore an indispensable source of funding priority projects and implementing the long-term technological development strategy are budget funds allo-



attract foreign investment, first of all, for the purposes of structural and technological economic reforms taking into consideration the needs of not just today, but those of tomorrow and the day after tomorrow.

**?** *It goes without saying that structural reforms of the economy are impossible wit-*

cated under specific budget programs and state funds.

In order to safeguard formation of technological corridors and implementation of specific high-risk applied R&D projects we will have to strengthen the role of the public and private partnership through concession agreements, project financing, venture and other funds.

Akadempharm has introduced a new antiviral drug, Fluestop, to prevent and treat acute respiratory viral infections





Cutting-edge technologies and high qualifications are the basis for producing competitive and quality products at Polotsk Steklovolokno. Prime Minister of Belarus Sergei Sidorsky visited the company in November 2010

Other major sources of investments include proprietary funds of companies and bank loans. Raising foreign investments, first of all, direct ones should remain high on the agenda as well.

We will have to fund creation and development of innovation infrastructure comprising technoparks, business incubators, technology transfer centers; to boost investments in the innovation sector and personnel development programs (by supporting higher learning institutions and professional education programs, etc.), innovation companies and clusters.

This is quite logical, as key factors of their development include a sophisticated university network integrated with the international educational system, transport infrastructure ensuring public mobility (airports, high speed motorways and highway networks), large and diversified labor markets that increase importance of satellite towns around big cities and make the life of their dwellers more comfortable.

**?** *How are you going to stimulate national high-tech products exporters?*

It is necessary to put in place a set of measures to protect and support economic interests of exporters in compliance with the current strategies and plans. I would like to single out the following measures:

- providing state support in the form of targeted export insurance and lending, insurance of export loans to shield exporters from commercial and political risks. Export insurance may be provided in the form of state guarantees under export loans;
- providing state support to innovation and investment projects to produce high-tech goods which will significantly increase their credibility in the eyes of domestic and foreign investors;
- developing leasing of export-oriented high-tech products;
- ensuring a free amortization policy and creating high-tech production facilities with special amortization standards for main assets;
- introducing official accountability statistics of high-tech products sales;
- providing exporters with information, consultation, marketing and technical support;
- providing scientific support to high-tech export development;

– setting up sectoral associations of producers and exporters and a wide network of sales representation outlets abroad.

**?** *Today developed economies are about to complete transition to the sixth technological paradigm. Unfortunately, in our country there are not many companies that are ready to make this transition. What is set to be done to bring the Belarusian industry closer to the level of developed countries?*

Among the key indices of the economic development of Belarus for the next five years are those assessing efficiency of performance of the industrial sector. Thus, in the next five years the profitability of industrial sales is projected to go up from an estimated 7.5% in 2010 to 14-15% in 2015, the average share of the shipped innovation products should jump from an estimated 11% in 2010 to 20-21% in 2015. Besides, in line with a presidential instruction it is necessary to double the share of science-intensive and high-tech products in the total Belarusian exports by 2015. Reaching these targets will only be possible by modernizing production facilities, introducing cutting-edge technologies and setting up new high-tech manufacturers.

The first step to setting up high-tech production facilities of the fifth and sixth technological paradigms based on domestic high technologies will be a drastic increase in R&D expenditures, first of all, the share of proprietary funds of industrial companies. In particular, in the next five years domestic expenditures in the area will grow from an estimated 0.64% in 2010 to 2.5-2.9% of GDP, i. e. the same level of expenditures as in such developed countries as Switzerland, Denmark and Austria. This target is attainable. For instance, in the Republic of Korea the R&D expenditures grew from 0.77%



in 1980 of GDP to 1.58% in 1985 with business expenditures increasing more than nine-fold to 1.18% of GDP (in 2003 business expenditures were at the level of 1.98% of GDP). In Belarus, non-budget R&D expenditures are set to reach 1.3-1.55% of GDP in 2015.

The second step will be the foundation of an electronics and optoelectronics sci-tech park in Minsk as well as a biotechnology sci-tech park Polesye in Pinsk.

The third step will be development of small innovation-active companies producing high-tech commodities. For this purpose it is necessary to set up sci-tech parks in all oblast capitals and universities in order to involve young scientists and students in innovation activities and provide support to small companies and sole traders in implementing innovation projects on creation of high-tech production facilities specializing in high-tech end products. In this respect it is advisable to introduce amendments

to presidential decree No. 123 of March 2009 “On some measures to stimulate innovation activities in the Republic of Belarus” and secure the right of universities and scientific organizations to set up not only unitary companies but also economic associations comprising universities (intellectual property), state-run companies (production facilities and technology) and private companies (financial resources).

In order to ensure the financing of small innovation-active companies we will promote the creation of venture capital organizations (funds). The Belarusian Innovation Fund will provide preferential financing of venture projects of small innovation-active enterprises.

The fourth step is the promotion of private research and science-technology centers (laboratories), including those at micro and small organizations and also at enterprises created by foreign high-tech companies. Here we will rely on the experien

ce of Israel, China and other countries.

In an economy based on knowledge, the creation of intellectual property and development of a supply-demand philosophy become more profitable than a simple increase in the production. Belarus has a high scientific potential. For example, according to the Thomson Scientific, Belarus is ranked 20th by total cites on nanocrystals, 16th on photonics and 6th on photonic crystals. According to experts, the future technological and social impact of nanophotonics can be compared with the impact of semiconductor electronics on technological advance and quality of life. It is important to create conditions for turning basic research results into applied research products and their industrial commercialization.

For these purposes we deem it necessary to encourage the establishment of private research centers, redeploy R&D personnel into the research sector of manu-



Scientists of the United Computer Science Institute of the National Academy of Sciences of Belarus have developed the SKIF-GRID supercomputer based on 12-core processors. Chief engineer of the project Alexander Lavrinenko, Executive Director of the Union State program SKIF-GRID Anatoly Krishtofik and engineer Mikhail Budrevich





Belarus' space technologies are in demand abroad. Belarusian research centers not only execute domestic projects, but also win international tenders in space exploration. Pictured is the receiver of the space research center in Minsk



facturing industry, including in private research laboratories.

The fifth step is the appraisal of existing facilities to determine the level of technological development (paradigm). Accordingly, government support to organizations will depend on their technological level and expected investment (innovation) projects that are proposed for implementation.

The sixth step is the introduction of the indicator “value added” in 2012 and abandoning that of “industrial output”. During the development and selection of projects to develop high-tech enterprises and manufactures, one of the major economic cri-

teria is a value added per one new job (the productivity of one new workplace should average at least \$60,000 per year). So far domestic organizations have not used the concept of “value added” in their accounting and statistical reporting. Therefore, in 2011 we are planning to make the necessary amendments to the regulations for determining the value added in the accounting and statistical reporting of organizations.

**?** *Do you think the implementation of the technological development strategy will help Belarus advance in the global ranking?*

Developed countries are starting to form a new technological base of their economies using the latest achievements in biotechnology, IT and nanotechnology (fifth and sixth technological paradigms). These cross-industry technologies will provide fuel for a new technological breakthrough and ensure both the emergence of fundamentally new industries and the production of traditional goods and services that will have the properties and parameters which were out of reach in previous technological paradigms.

During the formation of new technological paradigms, new economic sectors, nano-industry among them, may emerge in the short and long term perspective. In addition, new enterprises will be created on the basis of brand new technologies and products in existing industries.

The main trends in the scientific and technological development include:

- increasing convergence of technologies;
- increasing diffusion of modern high technologies in the medium-technology sectors of the manufacturing industry;
- growing importance of multidisciplinary scientific research;
- growing impact of new technologies on management and organizational forms of business, stimulation of the development of flexible network structures.

Each of these trends provides growth to new technologies and new areas of science in terms of their potential application in various areas of human activity. These technologies are in fact a response to global challenges and create a new technological image of the world.

In recent years, Belarus has carried out work to preserve and promote scientific, technological and innovation potential. We have improved the system of science management, expanded



and strengthened the regulatory framework of science and innovation, taken measures to raise the level of innovativeness of the manufacturing industry, to develop the related infrastructure and create small innovation-active enterprises.

Belarus holds leading positions in some areas of fundamental research in physics, mathematics, and new materials. The fund of ideas and concepts, previous and new scientific achievements allow the Belarusian science and economy to successfully cooperate with the international scientific community in such areas as computerization and software, nanotechnology and nanomaterials, energy-efficient technologies, genetics and biotechnology, environmental sustainability, radiation safety, etc. The results of applied research and development in recent years have helped to achieve tangible results in automotive and tractor industri-

es, municipal transport, medical equipment and medicines, sensor technology.

However, some negative trends in science and innovation persist. Innovative activity of the manufacturing industry of Belarus is mainly generated by a stable group of companies where innovation activity is ongoing and is associated with the acquisition of machinery and equipment at their own expense. The development of the innovation economy implies engaging in innovative activities a wide range of business entities with a wide range of innovations from different sources.

The level of scientific development of a country is the determining factor of competitiveness of its economy. Technological development fueled only by borrowed foreign technologies inevitably reduces the level of competitiveness. Therefore, the strategic focus for us is to enhance domes-

tic scientific and technological capacity.

The next five-year priorities include the technological development of economy and its restructuring through the creation of high-tech industries that can offer fundamentally new kinds of goods (services).

The main task is to create a globally competitive knowledge-intensive, resource-conserving economy by identifying promising 'technology corridors'. We need to accelerate the development of an effective national innovation system, and make the maximum use of existing conditions for the integration of education, science and industry, develop market incentives to improve the innovative activity of business entities.

If we materialize everything we have planned (and we certainly will), we will raise the Belarusian economy to a qualitatively new technological level. ■



A new high-speed tram 84300M is assembled at Belkommunmash. The tram can accelerate to 120km/h and can be used for commuting