

## Reindustrialization of Russia: Opportunities of Technology Import

The last two decades were marked by chronic underfunding of the Russian manufacturing sector, extremely slow renewal of its fixed funds, a high degree of their moral and physical deterioration and, as a consequence, an increasing technological lag and a significant drop in the competitiveness of most of its branches. Especially great damage was caused to the domestic machine-building complex, which technological level was badly damaged due to a decrease in innovative activity.

In 2012, the domestic market share of import accounted to 94% for metal-cutting machine tools and press-forging machines, 81% - tractors, 70% - bulldozers, 85% - excavators, 96% - construction loaders, 70% - mining equipment, 70% - oil and gas equipment, 99% - spinning machines, 91 % - weaving looms, and almost 100% - sewing machines.<sup>1</sup> Thus, we can say that to date in Russia there has almost completely disappeared the technological base for light industry, and the base for agriculture and extractive industries has weakened, and the technological base of the machine-building complex itself – machine-tool building - is on the verge of extinction.

In Russia, it is necessary to reverse the trend of de-industrialization and revive the national manufacturing sector based on the new technological base, while achieving diversification of its industrial structure. New industrialization aims to create conditions for a more dynamic and sustainable economic development, enhancement of its competitiveness, growth of innovative activity, strengthening of the positions in the global high-tech markets. Another goal of re-industrialization is to do away with the strongest dependence of the country on export of primary commodities and dominance of foreign suppliers in the domestic market.

<sup>1</sup> State Program “Development of the Industry and Increase in its Competitiveness,” site “State Programs”; Russia in Figures 2013-p.265.

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Domestic import, one of which functions is the importation of foreign investment equipment and technologies, aims to make a significant contribution to the success of re-industrialization in Russia. It is known that most countries resort to import technologies, since it gives them the opportunity to more quickly raise their technological level. For the modern Russia, foreign technologies are also important, since in many areas of STP it currently has only minimal background, and creation on their basis of appropriate technologies (in materialized and non-materialized form) will require significant resources and much time.

According to experts of the Institute of National Economic Forecasting of the Russian Academy of Sciences, the transition to a qualitatively new technological level supported by its own resources only «can cost Russia very expensive – take many years and result in the level of yesterday, while many developed countries will already be on the new frontiers.»<sup>2</sup> The present state of the domestic machine-building industry also gives no hope that our country will be able to raise its manufacturing industry and, especially, make a significant progress in the cultivation of new high-tech industries without massive use of advanced foreign technologies.

An analysis of the Russian import shows that currently its opportunities to obtain foreign technologies and accelerate re-equipment of the industry are not fully used. Its main drawback is an excessive focus on meeting current consumer needs. For example, in 2012, the share of consumer goods was 38.1%, and investment goods - only 24.9%. A consumer nature of the Russian import is particularly evident when compared to that of other countries that solve development problems similar to Russian ones. For example, the share of investment goods of the Chinese, Indian and Brazilian import far exceeds that of consumer goods.

Even less contribution is made by the Russian import in re-equipment of the domestic manufacturing industry. According to the Federal Customs Service, in 2012, Russia imported specialized technological equipment for different sectors of the industry in the amount of USD 8.7 billion (2.6 % of merchandise import). USD 3.0 billion of this amount accounted for metal-working tools and press-forging machines (0.9 % of merchandise import). For the country which stands before the task of re-industrialization and which has almost lost its own machine-tool building industry, such a volume of import of foreign metal-working equipment appears to be insufficient, as a result of which the process of transition to the new technological base both for the machine-building complex, and the whole economy may take decades or fail at all.

A small share of investment goods suggests that the Russian import has not become an effective tool for accelerating a scientific and technological progress, modernization of an industrial and technological potential of the country yet in contrast to many developing

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<sup>2</sup> Ivanter V.V., Komkov N.I. Basic Concept of Innovative Industrialization of Russia // Problems of Forecasting. -2012. – No. 5. – P. 8.

countries and countries in transition. To make it like that and to accelerate extremely slow renewal of fixed funds of the Russian economy, it is necessary to increase the share of import in machinery, equipment and other investment goods at least up to 30%. At the same time, the said increase should be selective and multi-speed for different types of equipment subject to the possibilities of increasing their production in the country. It is obvious that import of metal-working equipment, by means of which it is possible to revive the domestic machine-building industry, should have the highest rates that will enable to further reduce dependence on foreign equipment. Import of other types of equipment, for which the domestic manufacturers have good prospects of increasing the share in the domestic market, should be restrained to the extent possible. Similar multi-speed dynamics should obviously form a base for the strategy of the Russian import optimization.

It appears that apart from machine-tool building, electronics, pharmaceuticals and instrument-making should primarily be developed by advanced foreign technologies, i.e. those industries which particularly lag behind the world level. The most ready for import substitution industries are heavy and power engineering, since they managed to retain much of the scientific potential. Domestic transport and agricultural machine-building industries using an assembly factory factor are also ready for quite a rapid rise in the production.

A small amount of non-materialized technologies procured by Russia (in the form of patents, licenses, know-how, etc.) also shows underestimated import opportunities. In 2012, the country spent for this purpose about USD 2.0 billion (0.5% of the Russian import of goods and services).<sup>3</sup> For comparison, the United States, the leading country in technological development, in 2011, purchased foreign technologies in the amount of USD 34.8 billion, Japan – USD 19.2 billion, Singapore – USD 19.4 billion, Switzerland – USD 16.0 billion, and China – USD 15 billion. However, the small amount is not the main weakness of the Russian import of technologies. Its more serious problem is an unsuccessful structure of the procured technologies. In 2012, the predominant among them were engineering services (54%), i.e. the type of foreign experience that belongs to the group of «mature» technologies. At the same time, the share of purchases of patents, licenses and know-how that are usually associated with the development of new processes and types of products amounted to 12% only.

The sectoral structure of scientific and technical exchanges with foreign countries does not fully meet the strategic interests of Russia either. Formally, the bulk of non-materialized technologies (about 60%) are directed to the manufacturing industry of the country, but most of them are concentrated in just two sectors (metallurgy and

<sup>3</sup> The same year, the WTO estimates the Russian technology import at the level of USD 5.8 billion without revealing its composition. The difference is explained by the fact that the Russian statistics refers some import of engineering services for the procurement of packaged equipment to trade in goods.



food industry). In 2012, about 30% of all technologies were directed to the operations involving real estate, renting and business services. At the same time, the inflow of technologies in mechanical engineering, the main industry that determines the overall technological level of the country, is small. However, foreign technologies have quite actively been directed to the production of vehicles in recent years.

One of the reasons for insufficiently active use of clean technologies in Russia is that our country lacks experience and the relevant structures, which could bring the idea formulated in the license to the finished product in the form of a material, equipment or process. In these circumstances, the priority should be filling-in and improvement of the national and innovative system. First of all, this refers to the revival of sectoral research institutes, design bureaus, experienced enterprises that suffered during the crisis and reforms most of all. The functions of the latter, as is well known, consisted not only of scientific research and development, but also studies of advanced models of foreign equipment, which enabled to keep abreast of global STP.

Currently, Russia imports the overwhelming majority of technologies in the form of machinery and equipment. Meanwhile, international experience shows that in some cases technology import in a «pure» form, primarily in the form of patents, licenses and know-how, has several advantages compared to that of «materialized» technologies. License agreements, in addition to saving foreign currency, enable, as a rule, to receive from the seller a valuable know-how and assistance in improving the licensed products, and sometimes in their sale in the foreign markets. Moreover, such an agreement could be the starting basis for new domestic developments. According to experts, in the middle of the last decade, on the basis of license agreements there were produced more than half of the world output of machine-building products.<sup>4</sup> It is also worth recalling that due to licenses and know-how Japan, South Korea, Singapore and other Southeast Asian countries have overcome the engineering and economical lag behind developed countries. Developing strategy and tactics of foreign technology procurement, the specificity of their trade should not be lost sight of. So, if the producers of most commodities, as a rule, seek to expand their export and strongly support it, the owners of technologies, especially non-materialized ones, do not seek to share them with strangers at all, being fully aware of the fact that any innovative technology provides a competitive advantage in the market. Desire to transfer a technology outside appears only after the technology absorbed by the market moves from an early stage to a more mature one and does not enable the owner to continue to «skim the cream» off the market. At this point, the most rational solution becomes its sale and generation of additional profits through the provision of a professional complex of services for technical support, maintenance, repair, etc.

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<sup>4</sup> Problems of Effective Integration of the Russian Scientific and Technical Potential into the World Economy. M.: LKI Publishers, 2008. - P. 35.

Over the past 10-15 years the range of global exporters of materialized technologies (in the form of machinery, equipment, tools and various appliances, etc.) has grown considerably. Developed countries have been joined by a large group of developing countries (South Korea, Singapore, Malaysia, Thailand, China, Brazil, Mexico, etc.). In 2011, developing countries accounted for over 40% of the world export of machinery and equipment.<sup>5</sup>

The market of non-materialized technologies, unlike the market of machinery and equipment, is almost entirely owned by developed countries. Moreover, about 75% of the clean technology market account for five countries (USA, Japan, Germany, Britain, France), including the United States - about 45% (in 2010 - 50%).<sup>6</sup> The USA set the tone in international technology trade. It was under their pressure, as well as the EU and Japan based on the results of the Uruguay Round of Trade Negotiations GATT there was signed an Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), which is still the main regulator in this area. Influenced by the same USA, in international technology trade there began establishment of the principle that technology transfer is not possible if the receiving party lacks an effective system of protection and recovery of intellectual property rights.

In addition to TRIPS, trade in technology is subject to the Wassenaar Agreements on Export Controls for Conventional Arms and High Technologies («dual-use» goods and technologies), pursuant to which each state itself determines what of similar products and technologies it is ready to sell and to whom. In fact, it is a new form of the notorious COCOM. Based on this agreement, the United States, for example, regularly review the list of critical technologies, the transfer of which is restricted.

Russia, being strongly interested in import of foreign technologies (clean and materialized form), should certainly consider these features of the global technology market. In particular, our country has obviously to tougher stop violations of intellectual property rights, including importation and manufacture of counterfeit products, significantly expand the appropriate judicial and administrative base, improve the system of registration of trademarks and brands, create computerized information systems and control mechanisms, including the customs control system, prepare qualified personnel to carry out these functions. All this can improve Russia's image in the eyes of foreign technology sellers and investors. We also believe that it is necessary to learn from the experience of other countries (South Korea, China, Japan), which found strong incentives for foreign technology owners to share them with local firms in exchange for the possibility of conducting normal business in these countries. And another consideration: the best pass in the club of technology owners is own technologies suitable for exchange with club members.

<sup>5</sup> International Merchandise Trade Statistics 2011. UN. Table F.

<sup>6</sup> World Development Indicators 2012. World Bank. P. 332-334.



Relatively small amounts of technology import to Russia through the channels of international trade (both materialized and non-materialized form) are primarily a consequence of their low demand from the majority of Russian enterprises, which in a weak development of competition in the domestic market have no organic demand for a systematical renewal of products and equipment used. Insufficient favorable investment climate and the country's lack of effective incentives for innovative development negatively affect both investment activity and the volume of foreign technology import to the country.

While developing plans of re-industrialization, it should be clearly understood that the large-scale modernization and diversification of the domestic economy cannot be implemented spontaneously through market self-regulation mechanisms. Reindustrialization of Russia can succeed only if it is carried out within the framework of industrial policy, and the state will be at the top of this process. It is the state that has to develop the necessary economic and institutional conditions for the conversion of the economy to a new qualitative state. Among these conditions, the main thing is to create sufficient economic incentives (primarily, in the form of tax and financial benefits) of business entities for their active participation in the projects of modernization of the domestic manufacturing industry and the overall economy. A special place among the measures that can lead to improving the investment climate should be taken by the re-establishment of investment tax benefits. It would also be useful to implement measures aimed at the greatest possible easing of import of industrial equipment that is mainly not produced in the country. In particular, it could be possible to temporarily (5 -7 years) reduce import duties on such equipment to zero, even in the cases where it is not provided for by Russia's obligations to the WTO. Similar declines have already been practiced in the pre-crisis period. We also believe that there should be restored the practice of abolition of value added taxation in terms of technological equipment (including components and spare parts), analogues of which are not produced in Russia.

Promotion of innovative development can also be a very effective way of increasing investment activity. For example, in this direction there will be more large-scale co-financing of R & D aimed at the creation of the newest equipment, as well as reimbursement of expenses for technical upgrading. Technological upgrading of manufacturing industries could also be encouraged by enhancement of opportunities for their crediting. Turning commercial banks towards the financing of investments in fixed funds of manufacturing industry enterprises could be carried out by transferring a certain part of gold and forex reserves of the state, for example, two-fifths to the Bank for Development and Foreign Economic Affairs. That would be a rational decision: the current level of reserves, according to experts, is excessive.

A crucial aspect of the policy aimed to encourage import of investment equipment and technologies is that the mentioned system of measures should be a part of the overall scientific, technical and industrial policy of the country. Within the framework of this policy, based on the existing groundwork of domestic developers and general prospects of the global STP, there should be determined, on the one hand, technologies and types of equipment with the highest priority for the development using own resources, and on the other - technologies and equipment which importation into the country should be stimulated. This policy should be developed in such a way so that none of the domestic sector of research and development, the domestic industry, or the technological security of the country as a whole has suffered.

Experts are almost unanimous that in the midst of re-industrialization of Russia there should be the domestic machine-building sector - an industry, which, on the one hand, more than others suffered during the reform years, and on the other, which state all other sectors of the economy, defense capabilities and economic security of the country depend on. Only having raised the machine-building sector, it is possible not only to accelerate technical upgrading of the entire economy, including manufacturing, but also put an end to the excessive dependence of the country on the supply of foreign equipment.

Calculations show that re-equipment of the domestic machine-building sector will require vast quantities of metal-working equipment. Meanwhile, as already mentioned, the state of the Russian machine-tool industry is extremely difficult, it is able to provide putting into operation of not more than 6% of the equipment under installation. Conclusion from the above is clear: now re-equipment of the domestic machine-building sector by means of the Russian machine-tool industry, even abstracting from the technological level of the equipment under installation, is not possible. Thus, in the coming years, import will remain an important source of technological re-equipment of the Russian machine-building sector.

Non-military industries will obviously not experience any obstacles in gaining access to most types of metal-working equipment, including the most complex ones. However, in special machine-tool building associated with the defense sector, aerospace and nuclear industries, certain difficulties may arise. Equipment for these industries cannot be ordered from foreign companies, because in this case it will be required to give a potential developer access to secret enterprises, technical assignments revealing details that can be commercial or state secrets.

If Russia is going to produce modern weapons and complex high-tech products, it has to possess developed production of, at least, the most complex and precise machines. In this regard, it should be recognized that it was completely correct that in 2011, the Government adopted the program «Development of Domestic Machine-Tool Building and Tool-Making Industries» (within the state program «Development of the Industry and Increase in its Competitiveness»), which for the first time for 20 years provides



for the allocation of budgetary funds for R & D to develop new models of machines, prototyping and creation of capacities for their further manufacture. The main goal of the program is to eliminate a critical dependence of the Russian strategic organizations of machine-building and military-industrial complexes on the supply of foreign technological equipment. It seems that, if successful, the program could be the start of re-industrialization of Russia. We believe that similar programs aimed to restore the country's production of high-precision test equipment, high-tech welding and autogenic equipment, and also processing tools for different materials could be very useful.

Recognizing the lack of alternatives in terms of import of many types of equipment and technologies for the start of re-industrialization in Russia, we believe that our country, like any large country with a high potential for education and basic research, should not rely solely on the use of imported technologies. Such a strategy may lead to a further decline of the domestic science, enhancement of the process of brain drain, deterioration of the human potential and, as a result, create serious threats to its economic security and defense capability of the country. Moreover, such a strategy would seriously lower the efficiency of the use of foreign technologies. Until we finally lost our scientific «competence» at least in some STP areas, efforts should be made to support the process of reproduction by all means. Without that Russia would never overcome the stage of catch-up development, and technologies transferred to the country would not become points of growth of domestic innovations.

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