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KHARKIV INNOVATION SYSTEM: STATUS, CHALLENGES, AND PROSPECTS



The implementation of the Regional Innovation System (RIS) Project in Kharkiv has been discussed. The history of the RIS Project, its structure, composition of innovation system elements, and status of their development have been described. The factors influencing the effectiveness of developed innovation system have been identified and discussed.

Key words: regional innovation system, innovation potential, and innovation infrastructure cluster.

Since the end of the last century, as the advanced economies enter the global economy, they not only implement technological, commercial, and corporate restructuring of the economy, but also demonstrate their new territorial architecture, with the formation of institutional arrangements and infrastructure of innovation economy to represent regional innovation systems (RIS) being the most important task of the regional economic policy.

Kharkiv is one of the largest centers of science, education, and industry in Ukraine. It has all the prerequisites to be a regional leader in the development of individual innovation institutions, the creation of an integrated regional innovation system, and in the transition of the regional economy to innovation-based development.

The first efforts to design the elements of new economic system of Kharkiv city date from the early 1990s, when the local authorities initiated a call for proposals to transfer the region's economy on the principles of cost accounting, thereby starting the analysis of opportunities and alterna-

tives of city development. Then, in the city, several expert groups worked at shifting the regional economy from the state of a dependent element in the economic system of the USSR to the state of quasi-independent economic system of market type with different control and regulation options. The spectrum of these options was quite wide, from the rigid hierarchy with the extensive use of automated management systems to the broad autonomy of economic agents using soft mechanisms of regulation by governmental agencies and various associations of economic agents. The development of projects of innovative structures and regional innovation systems in the late 1990s was driven by the appearance of first business innovation centers created within international programs for support of market reforms and as a result of the implementation of Ukrainian programs for the development of new economy. Just then, in the city, there appeared the business center of NTU KhPI, *Kharkiv Technologies Center* for Small Business Support, Institute for Single Crystals Technology Park, and the technological park of NSC of Kharkiv Institute of Physics and Technology. Participation in the development

and implementation of these projects required from their initiators and executors a detailed acquaintance with the world practice of the functioning of such structures and a deep understanding of the possibilities of its adaptation to the real conditions of Ukraine. This fact was a decisive factor in the formation of Kharkiv group of professionals experienced in the systemic design of individual innovation institutions and in the design of RIS.

The first conceptual design of such a system (Kharkiv innovative port (KhIP) project) started in 2001 on the initiative of the North-East Scientific Center of NASU and MES of Ukraine (NESC of NASU). As part of this project, the basic principles and the concept of RIS were identified and formulated; the structure of the system and the basic requirements for its members have been defined.

The main objectives of the innovative port project were as follows:

- ✦ To create an organizational, economic, financial, and information system that ensures the formation and development of the regional network of efficient export-oriented manufacture of intangible products with leading foreign companies involved;
- ✦ To design and to create the effective support of existing and future industrial manufacture of high-tech products in the region.

A legal mechanism for the creation of spinoffs (independent companies based on scientific and technical institutions) with the transfer of rights to the commercialization of intellectual property was offered as a basic mechanism to achieve the first objective. However, KhIP did not reach the implementation phase insofar as the concept and principles of the proposed innovation system were well ahead of the regulatory framework that existed in Ukraine at that time.

The second stage of the planning of Kharkiv oblast RIS is referred to 2004–2005, when the innovation system project was developed by order of the Kharkiv Regional Public Administration that intended to include this project into a pro-

spective program for socio-economic development of the region. The project was designed by a team of specialists consisting of the representatives of science, education, private business, and government sector. The project was approved within the region and submitted to the Cabinet of Ministers of Ukraine as a pilot project for looking into the possibility of its further implementation throughout the country.

The project was approved by all the three relevant ministries, but the final approval did not take place for a very banal reason: a radical change of the Cabinet of Ministers.

The third phase of practical implementation of Kharkiv RIS began in 2008, upon the initiative of the Kharkiv Regional Center of Investment and Development created in 2007. Upon request of the Kharkiv Oblast Public Administration, in 2008, several infrastructure projects of new RIS were developed and implemented in 2009–2010. Among the accomplishments, there were the organization of regional seminars on innovation on a regular basis, launch of *Kharkiv Innovation* website, holding of several sessions of public hearings on the challenges and prospects of regional innovative development, and preparation and publication of an analytical report on the Kharkiv innovative potential.

To intensify the transfer of domestic technologies the needs of Kharkiv industrial corporations were analyzed for studying the possibilities of city research organizations to address them. Upon the results of this analysis, *Technology Wanted* and *Technology Offered* public electronic databases were created and placed on the *Innovative Kharkiv* website. At the same time, a methodology for the inventory of innovative resources of Kharkiv R&D and industrial complexes and the first inventory procedures were developed.

One of the important initiatives of 2010 was the decision to create a cluster of Kharkiv Oblast innovation infrastructure, a voluntary association of research, industrial, infrastructural centers, institutes, and individual professionals involved in the regional innovation processes. The

first congress of representatives of organizations was held, where the members signed a Memorandum of Cooperation and Intention to establish an innovative cluster. However, this project was not implemented insofar as in 2010, the priorities of national policy for economic development changed.

This policy implied shifting from the innovative to the investment vector. For a certain period, it postponed the development of Kharkiv RIS. However, in early 2012, the region entered a new stage of innovation activity starting with the Agreement on Cooperation between the Kharkiv Oblast Public Administration and Kharkiv Oblast Council, on the one hand, and the State Agency for Science, Innovation, and IT Development of Ukraine, on the other hand, signed in February 2012. The main purpose of this Agreement was to create favorable regulatory, organizational, and economic conditions for sustainable growth of innovative activity in the region and for transition of the regional economy mainly to the innovation-based development.

In February 2013, the Kharkiv Oblast innovation infrastructure cluster was founded as one of key tools to achieve this goal. Its managerial bodies, the Cluster Board and the Working Group, were established. Nineteen founders signed the Memorandum of Association with respect to the cluster. Among them, there were several leading academic institutions, major universities of Kharkiv, the regional business association, business centers, technology parks and research parks of the city, as well as several individuals, experts in the field of legal, organizational, and technical aspects of commercialization and technology transfer. Pursuant to the Memorandum of Association, it is aimed at ensuring cooperation between the parties for the purpose of establishing and operating the regional cluster of innovation infrastructure as a tool for the integration of resources and the coordination of innovation activities in the region while developing and implementing the regional innovation system, in accordance with the Agreement on Cooperation between the Kharkiv Oblast Public Administration and the

State Agency for Science, Innovation, and IT Development of Ukraine of 03.02.2012, as well as with programs for attracting investments into the economy of Kharkiv Oblast till 2015.

The main objectives of the cluster were identified as follows:

- ✦ To organize and to coordinate the creation and development of innovation infrastructure in the region;
- ✦ To raise the funds required for the establishment and functioning of the regional innovation system and innovation development of Kharkiv Oblast;
- ✦ To assist the cluster members in developing their innovative capacity and expanding their presence in the market of innovative services;
- ✦ To provide the members with support in information, legal, organizational, and administrative spheres;
- ✦ To establish and to develop cooperation with international innovation support programs and networks;
- ✦ To organize and to participate in the various innovation-related events, including forums, conferences, and seminars in Kharkiv Oblast;
- ✦ To participate in the implementation of programs for training and improvement of qualifications in the field of innovation;
- ✦ To participate in studying the status and conditions of the innovation sphere of Kharkiv Oblast and to prepare the analytical and reporting materials;
- ✦ To assist public authorities and local government in their efforts to develop innovative processes in the economy of Kharkiv Oblast.

Organizational and legal form of the cluster is voluntary association of businesses and individuals without incorporation of a legal entity. The cluster is based on NESO of NASU and MES of Ukraine.

While implementing the work plan of the cluster the members prepared several basic documents and materials necessary for the creation and improvement of the basic elements of Kharkiv RIS. A draft concept of innovative development of Kharkiv

Oblast economy was elaborated. Based on the analysis of initial economic conditions and the assessment of innovative capacity of Kharkiv Oblast the main directions of development of innovative activities in the region were identified as follows:

- ✦ To improve the legislative, regulatory, and methodological support of innovation processes;
- ✦ To develop the innovative infrastructure in the region;
- ✦ To intensify the innovation activities of large industrial enterprises of the region;
- ✦ To support and to develop small manufacturing and technological businesses;
- ✦ To train and to improve the innovation culture in the society.

The draft conception sets forth specific activities for the development of each of these areas.

For updating the information on the status of innovative capacity of Kharkiv (which is necessary for the development of realistic programs and innovative development projects), the members have elaborated the methods of innovative capacity inventory for the R&D institutions and industrial corporations.

This inventory makes it possible to free from obsolete or very vague ideas about current innovative resources, as well as to obtain information about existing (but often disregarded) possibilities of commercial use of available diagnostic and process equipment and expertise dispersed throughout the R&D and industrial sectors.

An important aspect of the cluster activities in 2013 was the preparation and holding of the first forum of small engineering companies engaged in the development and implementation of new technologies and the manufacture of high-tech products. While organizing the Forum, the initiators proceeded from the fact that such companies were among the most important resources of the innovation economy and, therefore, this kind of small business should be supported by the regional authorities as well as by the existing large businesses.

These companies as germs of modern post-industrial economy can never become full members of the innovation process, unless they gather sup-

port from large enterprises. The best of them can be locomotives of the innovation economy.

The goals of the Forum were established as follows:

- ✦ To identify resources and to analyze the problems of development of small engineering companies;
- ✦ To offer the cluster opportunities to support small businesses in marketing, business planning, recruitment, training of staff, search of customers, and fund raising, including on the international scene.

The Forum showed that the status of small engineering business met neither the scientific, technical, and production capacity of the region nor current need in technological upgrading of regional production facilities. Based on the materials of the Forum the members decided to develop regional programs for support of small businesses in the technology sector.

The lack of qualified specialists among the local authorities responsible for the regional economy modernization is known to be one the factors hampering the innovation development. In order to eliminate these barriers and to improve the innovation culture the specialists of KhII cluster have developed a targeted training course on investments and innovation management for the regional public servants. The course structure has two components: *the theoretical* methodology for the management of development of socio-economic systems and *the practical* development and implementation of investment projects.

Among the important activities of the innovation cluster, there is the information and communication technologies that allow the users to create distributed systems, virtual innovative infrastructures. The cluster expansion across its geographical boundaries makes it possible to build virtual infrastructures to intensify innovative processes, to involve new resources, to improve the efficiency of their use, to promote and to expand the scope of e-learning.

In connection therewith, a member of the cluster, *Kharkiv Technologies* Center for Small Business Support, has initiated and been implementing the *Kharkiv Innovative Platform*, a multifunction

communications resource project. The aim of the project is to ensure an information environment for commercialization of research products, to create innovative products and services, to raise additional funds, as well as to train specialists in the sphere of technology transfer and commercialization of science. Upon the project completion, the platform users are expected to be able:

- ✦ To receive relevant information about the legal aspects and legislative acts in the field of innovation;
- ✦ To conduct marketing research of new technologies and innovative products;
- ✦ To obtain information on the demand for innovative solutions for all the stakeholders, including the government, the industry, the academic institutions, and the consumers;
- ✦ To find partners and to establish business contacts with experts in technology transfer, scientists, and businessmen from Ukraine, Europe, USA, and other countries;
- ✦ To attract investment in the research and innovation sphere;
- ✦ To participate in the national and international competitions for innovative ideas, projects, and products;
- ✦ To participate in forums, seminars, and conferences on the development of innovations;
- ✦ To liaise with other innovative Internet resources;
- ✦ To participate in the e-training programs on commercialization of research results;
- ✦ To gather support for the purpose of joining new *Horizon 2020* European Program for Research and Innovation.

Another important area of cluster activities, especially, given the European integration vector of Ukraine, is to promote cooperation between the Kharkiv researchers and businessmen, on the one hand, and the European research and innovation society, on the other hand. Kharkiv is one of the most successful Ukrainian regions in respect of participation in the 7th Framework Program (EU FP7) for Research and Technology (it is ranked second yielding to Kyiv only). In particular, *Kharkiv Technologies* Center for Small Business Support has been a participant of 6 similar projects. Now, it started implementing the *SECURE R2I* project aimed at strengthening cooperation between Ukraine and the EU on the security issues (social objective of the 7th *Horizon 2020* program). This objective covers a wide range of research areas, including information and communication technologies, public safety, nanotechnology, and new materials. The project is implemented to support the Kharkiv (and Ukrainian) research and innovation organizations in the field of technology transfer and implementation of R&D results in the real economy and to assist the Ukrainian researchers and business entities in implementing the *Horizon 2020* joint projects together with European partners. For this purpose, an extensive online catalog is created. It will contain information on the research and innovative competence of Ukrainian organizations working in the field of security, which are interested in joining this program. The catalog will be widely represented in the electronic resources of the European Commission.

In 2011, three national contact centers of the 7th Framework Program were created in Kharkiv. Most likely, they will continue their activities within the framework of new *Horizon 2020* European program.

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ІННОВАЦІЙНА СИСТЕМА ХАРКОВА: СТАН, ПРОБЛЕМИ, ПЕРСПЕКТИВИ

Наведено огляд реалізації проекту регіональної інноваційної системи в м. Харкові. Описані історія створення системи та стан її розробки. Обговорено проблеми та умови дієздатності створюваної системи.

Ключові слова: регіональна інноваційна система, інноваційний потенціал, кластер інноваційної інфраструктури.

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**ИНОВАЦИОННАЯ СИСТЕМА ХАРЬКОВА:
СОСТОЯНИЕ, ПРОБЛЕМЫ, ПЕРСПЕКТИВЫ**

Представлен обзор реализации проекта региональной
инновационной системы в г. Харькове. Описаны исто-

рия создания проекта, его структура, состав элементов
инновационной системы и состояние их разработки.
Обсуждены проблемы и условия дееспособности созда-
ваемой системы.

Ключевые слова: региональная инновационная сис-
тема, инновационный потенциал, кластер инновацион-
ной инфраструктуры.

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