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# THE DEVELOPMENT OF INNOVATIVE CAPACITY OF R&D INSTITUTIONS OF UKRAINE AS A RESULT OF PARTICIPATION IN THE PROJECT OF THE SEVENTH FRAMEWORK PROGRAM OF THE EUROPEAN UNION


*The paper considers the successful experience of the V.M. Bakul Institute for Superhard Materials of the NAS of Ukraine in the Start project (contract no. 295003) within the 7th Framework Program of the European Union, which has had a favorable impact on raising the research and innovation potential and on the implementation of the Institute's innovations to the economy of Ukraine and Europe.*

*Keywords: integration of Ukraine to the EU, research institution, innovation activity, and Seventh Framework Program.*

Among the positive aspects of the integration of Ukraine into the European Union (EU), there is the support of Ukraine's innovation development by the EU countries whose high potential in this field matches that of the innovative leaders, the USA and Japan. The labor productivity has traditionally been considered the most clear indicator of the economy effectiveness. The EU (especially, its leading countries) is the world leader by this measure. The labor productivity in the EU was 2.5 times higher than in Russia, and 4 times higher than in Ukraine. The average level of energy efficiency in the EU economy exceeds three times that in Russia and 4 times that in Ukraine. The investment capacity of EU-15 is ten times higher than that of Russia, and that of the EU-27 surpasses six times Russia's one. The EU high innovative potential was one of the most powerful and inspiring factors for Ukraine to choose the European integration. This potential is successfully utilized by Slovenia, Poland, Slovakia, and the Baltic States. In general, the effectiveness of reforms and the modernization of society in the EU member states are among the highest in the world [1].

According to the *Strategy 2020* European program the share of R&D expenditure in GDP (hereinafter referred to as the intensity of R&D) is expected to reach 3% for the countries of the European Union (EU-27). The average R&D intensity in the EU-27 amounted to 2.01%, in 2010, and 2.03%, in 2011. The highest share of R&D expenditure in GDP was recorded in Finland (3.78%), Sweden (3.37%), Denmark (3.09%), Germany (2.84%), and Austria (2.75%). The smallest one was reported for Cyprus, Romania, Bulgaria, and Slovakia (from 0.48 to 0.68%). The R&D intensity of Ukraine was 0.75%, in 2012, including 0.33% at the expense of the state budget [2].

During the 2008—2013, the number of enterprises engaged in innovation activities in Ukraine gradually increased from 13.0% to 16.8% due to the acquisition of machinery, equipment, software, etc., but the number of R&D works and


Project team consisting of the representatives of Ukraine and European countries

innovations commercialized showed a downward trend. [3]

The R&D capacity of Ukraine in the last 20 years declined from 1518 R&D institutions, in 1998, and 1510, in 2005, as compared with 1255, in 2011. Also during this period, the research staff dropped rapidly (3.5 times), from 313 thousand, in 1990, to 85 thousand, in 2011. The share of R&D works in Ukraine's GDP is too low: 1.36%, in 1990; 0.98%, in 2006; and 0.79%, in 2011. This affects the overall level of innovation development of Ukraine's economy, which grows exclusively due to extensive factors, the upgrade of tangible facilities for the implementation of innovations [4].

Among the directions of support of Ukraine's R&D capacity, there is its integration into the European research environment within the framework of the EU programs for R&D development, which are the main instrument for implementing the EU research policy and for creating the common European Research Area (ERA).

The involvement of Ukrainian R&D institutions in EU programs for R&D development is an important element of Ukraine's integration into the EU in the field of scientific cooperation. It is also useful for the enhancement of innovation capacity of Ukraine and Ukrainian R&D institutions and for the improvement of the overall innovativeness of Ukraine's economy.

Among the examples of successful involvement of Ukrainian R&D institutions in EU programs is the implementation of project on the development of Ukraine-EU cooperation in the field of superhard materials (contract no. 295003) by the V.M. Bakul Superhard Materials Institute (ISM) of the NAS of Ukraine that within the period from 01.11.2011 till 07.31.2014, as coordinator of international consortium, the *Start* Project of 7$^{th}$ Framework Program. As part of the *Start* project, the strategy of ISM NAS of Ukraine – 2020 was developed. It focuses on enhancing the status of ISM NAS of Ukraine as R&D institution in

Europe and throughout the world by creating an innovative research entity and improving the research and innovation competences of ISM employees through their involvement in research seminars, training tours, and internship projects within *On the job FP7 Training* and *Internship* programs including but not limited with three educational and training events of *Intensive FP7 Training Course*, information days, and international conferences [5, 6].

It has been found that 50% of technical offers at the ISM matches the average (or exceed it) level of innovative capacity; their commercialization capacity is 45.8%. The assessment of innovative competence of focus groups of ISM researchers has showed that about 82.7% of employees improved their knowledge in the field of R&D innovation during the project implementation [6].

The famous researchers from European materials research centers in France, Germany, Poland and the partners of future international projects attended the final international conference of the *Start* project held on June 26—27, 2014.

Among the important results achieved due to the implementation of the *Start* project, there is the introduction of *the Strategy of ISM of the NAS of Ukraine – 2020* by incorporating nine international consortia, preparing and submitting to the EU programs and international funds the eleven research projects (7 projects have been launched; 6 projects have started preparing for the *Horizon 2020* program), and establishing the Department for Innovation and Technology Transfer as ISM structural unit in accordance with the decision of the Institute's Scientific Board and the resolution of the National Academy of Sciences of Ukraine of 06.17.2014.

Another result of the *Start* project was the introduction of post-operation plan within which a fundamental research on topic no. 2101, the development of theoretical and methodological guidelines for innovative R&D complex in the field of high pressure materials science and for the establishment of an effective system of transfer of new technologies, materials, and derivative products (science topics IV-1-14 NAS of Ukraine) has been launched. In the course of this program, its contributors have improved a model for technology transfer and offered an organizational and economic mechanism for facilitating the development of innovative potential of Ukrainian research institutions and corporations.


Final conference of the *Start* project

The next phase of *the Strategy of ISM of the NAS of Ukraine — 2020* and post-operation plan is to create technology transfer centers (TTC) focusing on the promotion of innovative R&D projects through establishing and developing international relations, raising the research and innovation competences of researchers, and through supporting the development and implementation of innovative projects.

## CONCLUSIONS

High innovative potential of the EU is one of the most powerful and inspiring factors for Ukraine to choose the European integration.

The key factor of the EU innovative capacity growth is a high share of government spending on R&D activities in GDP.

In 2008—2013, the number of R&D works and commercialized innovative projects showed a downward trend.

In the past 20 years, the R&D capacity of Ukraine declined and so did the share of R&D works

in Ukraine's GDP. The economic growth of Ukraine has been driven solely by extensive factors, the upgrade of tangible assets for the implementation of innovations.

Among the directions of development of Ukraine's R&D capacity, there is its integration into the European research environment within the framework of the EU programs for R&D development. Among the examples of successful involvement of Ukrainian R&D institutions in EU programs is the implementation of *Start* project within the 7th Framework Program by the ISM of the NAS of Ukraine, which has a positive impact on raising the innovation capacity of R&D projects and facilitating the commercialization of ISM R&D works in the economies of Ukraine and Europe.

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РОЗВИТОК ІННОВАЦІЙНОГО ПОТЕНЦІАЛУ НАУКОВОЇ ОРГАНІЗАЦІЇ УКРАЇНИ ЯК РЕЗУЛЬТАТ УЧАСТІ У ПРОЕКТІ 7 РАМКОВОЇ ПРОГРАМИ ЄВРОПЕЙСЬКОГО СОЮЗУ

Розглянуто успішний досвід участі Інституту надтвердих матеріалів ім. В.М. Бакуля Національної академії наук України в проекті «Старт» (контракт № 295003) 7-ї рамкової програми Європейського Союзу, що справило позитивний вплив на підвищення інноваційного потенціалу наукових досліджень та впровадження інноваційних розробок інституту в економіку України та Європи.

*Ключові слова:* інтеграція Україна–ЄС, науково-дослідна організація, інноваційна діяльність, проект 7 рамкової програми.

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РАЗВИТИЕ ИННОВАЦИОННОГО ПОТЕНЦИАЛА НАУЧНОЙ ОРГАНИЗАЦИИ УКРАИНЫ КАК РЕЗУЛЬТАТ УЧАСТИЯ В ПРОЕКТЕ 7 РАМОЧНОЙ ПРОГРАММЫ ЕВРОПЕЙСКОГО СОЮЗА

Рассмотрен успешный опыт участия Института сверхтвердых материалов им. В.М. Бакуля Национальной академии наук Украины в проекте «Старт» (контракт № 295003) 7 рамочной программы Европейского Союза, что оказало положительное влияние на повышение инновационного потенциала научных исследований и внедрения инновационных разработок института в экономику Украины и Европы.

*Ключевые слова:* интеграция Украина–ЕС, научно-исследовательская организация, инновационная деятельность, проект 7 рамочной программы.

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