ATLANTIS PRESS

Advances in Economics, Business and Management Research, volume 79

International Scientific Conference "Far East Con" (ISCFEC 2019)

Ecotechnologies as a Promising Component of Innovative Development of University Cities in Siberia: Increasing the Comfort of Living

Podoprigora Y.
Tomsk State University of Architecture and Building, 634003, Tomsk, Russia

Zaharova T.
National Research Tomsk State University, 634050, Tomsk, Russia

Ufimtseva E.
Tomsk State University of Architecture and Building, 634003, Tomsk, Russia

Eliseev A.
Tomsk State University of Architecture and Building, 634003, Tomsk, Russia
e-mail: y.v.p@rambler.ru

***Abstract*—The given research is devoted to comparative analysis of university cities' development practices and study of best innovative practices in Siberian university cities. The research topic is rather urgent because university campuses are centers of urban environment development that have innovative potential and contribute significantly to the creation of environmentally-friendly infrastructure. The idea that environmental modernization is aimed at the reduction of pollutant emissions, improvement of architectural appearance, utilization of modern construction technologies, urban greening, sanitary purification, public transport improvement, promotion of region-appropriate alternative energy types along with energy-efficient technologies and creation of eco-friendly dwelling areas. The emphasis is put on the fact that innovations are the prerequisite for urban environment and its infrastructure development. We demonstrate that universities function as major drivers of city's progress through the realization of their innovative projects for the city's infrastructure. Therefore, universities transform urban surroundings. The research is based on particular cases of innovative development of university cities in Siberia. We conclude that the transition to eco-friendly technologies results in the generation of highly-paid employment, the increase in social welfare, and the improvement of public facilities without exposing future generations to considerable environmental risks.**

Keywords*—*university campuses, innovations, eco-friendly economy eco-friendly technologies, public amenities, university cities.

I. Introduction

Universities appear to be the drivers of urban development by introducing their innovative projects into urban environment. The importance of universities at the time of information-oriented society increases and becomes a factor of economic and investment attractiveness of cities. Therefore, city authorities are motivated to develop universities (university networks) and to transform cities into centers of science and educational opportunities. At the same time focusing on eco-friendly technologies allows commencing sustainable city development process.

II. Topicality of the Issue, Scientific Actuality Given with Brief Literature Review

The United Nations Organization has developed the Concept of Sustainable Development. Environmental dimension of the Concept advocates for the improvement of ecological situation; its social dimension is based on equitable distribution of wealth; the economic dimension requires life quality growth [1]. It should be mentioned that eco-friendly technologies do not only provide business with opportunities for contributing to saving the planet from environmental collapse but also provide the means for implementation of new business opportunities and obtaining new competitive advantages [2], which in their turn benefit the market.

In order to achieve sustainable development it becomes essential to convert current economy into an eco-friendly or innovative one [3-5]. The cities that gained success in the sphere are called 'green' which means having developed or adopted innovative technologies aimed at solution of urban issues [6, 7].

The research is urgent because the modernization of higher education in the Russian Federation makes rethinking of university-city collaboration in Russian conditions very necessary. In addition, the integration of life quality increase efforts in university campuses as well as university cities completely obligatory. In this respect major role is played by development of campuses in terms of 'eco-innovations'.

World economic system is not able to change the trajectory of its development promptly and drastically (for instance abandon consumer's paradigm). However, it may become possible through the introduction of an eco-friendly economy according to the opinion of such scientists as S.P. Bashkirov, Y.U. Vasiliyev, S.N. Bobylev, T.V. Gagnidze and others [1,3,4,8]. The theory of innovative economy driven by

universities has a considerable number of supporters among whose A.N. Kazantseva, K.D. Kalinina, I.P. Nuzhina, N.V. Pakhomova, Y.Y. Sklyarova [9-13] and others can be named. Scientific and practical novelty is based on the analysis of universities' impact on promotion of eco-friendly economy introduction in socio-economic and cultural spheres of a contemporary city.

III. Aim Setting

The aim of the research is to provide information support for the development and implementation of eco-friendly innovations by small-scale university enterprises as well as major production companies of Siberian cities.

IV. Theoretical Part

Eco-innovations and eco-technologies are those which possess an ability to reduce impact on the environment such as new products, processes and systems requiring minimal utilization of natural resources and producing low pollutant emissions [14]. Innovations are essential for urban environment and urban infrastructure development [15, 16]. Infrastructure industry can be both the basis and an outcome of the city / university innovative development which transform their surroundings and make them more comfortable [17, 18]. The adoption of inventions of university scientists in production sphere makes a similar contribution [19].

V. Practical Importance

The research also has practical significance. Comparative study of university cities and analysis of best Siberian practices make it possible to elaborate up-to-date, recommendations for Siberian city mayors on prospective measures of urban infrastructure development in accordance with the requirements of eco-friendly economy and increasing of town attractiveness among students. For instance, Novosibirsk, which recently hosted Urban Technologies International Forum, has initiated the utilization of modern technologies created by university scientists for its citizens' every-day life. The amount of knowledge accumulated in Tomsk universities also facilitates the development of ideas of eco-friendly economy in all industrial dimensions. Utilization of university innovations becomes possible both through participation in production sequences of big-scale companies and in student start-up companies located in Tomsk.

Therefore, the knowledge accumulated in such university cities as Tomsk and Novosibirsk ensures the development eco-friendly economy ideas in all industrial dimensions: introduction of renewable sources of energy; energy-efficiency in housing and utility complex; improvements in waste management system; development of eco-friendly transport; preservation and efficient management of eco-systems.

VI. Conclusions

University campuses as the centers of urban environment development, possessing their own innovative potential, should promote the creation of eco-friendly infrastructure ensuring provision of urban facilities, eco-friendly development. In addition, they may contribute to branding both their own premises but also city and region's territories through cooperation with city officials and business representatives. City modernization should lead to the decrease in pollutant emissions, improvement of architectural appearance, utilization of new construction technologies, city illumination, greening, sanitary purification, development of public transport, transition to electric transport, region-appropriate types of alternative energy and energy-efficient technologies, development of eco-friendly dwelling areas [20-23].

Obviously, current economy dealing with ecological and socio-economic system relations is in need of transition to eco-friendly technologies which will result in the generation of highly-paid employment and the increase in welfare without major environmental risks for future generations.

Acknowledgements

The reported study was funded by RFBR according to the research project №18-510-22001.

References

[1] Gagnidze, T.V., Gudz, T.V.: Development of the city of perm by way of interaction between the city and the campuses. Bulletin of the Perm National Research Polytechnic University. Applied ecology. Urbanistics 1, 19–32 (2017).

[2] Global "green" new course. Report of UNEP. 2009, March. It is published by the Program of the UN for the environment within the Initiative of "green" economy. URL: http://www.unep.org/greeneconomy/portals/30/docs/GGND-polisy-brief_RUSSIAN.pdf, last accessed 2017/11/1.

[3] Bobylev, S.N.: Environmental challenges and "green" economy. Vestnik MITHT. Ser. Social and Human Sciences and Ecology 1, 5-14 (2014).

[4] Bobylev, S.N., Solovyova, S.V.: The new purposes for new economy. World of new economy 1, 6 – 14 (2016).

[5] Morrow, K.: Rio-20, the Green Economy and Re-orienting Sustainable Development. Environmental Law Review 14, 279-297 (2012).

[6] Egorenkov, L.I.: Ecological innovations in the Moscow region. Problems of regional ecology 1, 110-112 (2017).

[7] Firulina, I.I., Veretennikov, M.Y.: Green business and aspects of its development. Regional development: online scientific and practical journal 5 (17) (2016), https://regrazvitie.ru/zelenoe-predprinimatelstvo-i-aspekty-ego-razvitiya, last accessed 2018/05/03.

[8] Bashkirov, S.P., Vasiliyev, Y.Y.: "Ukhta – the university city": economic measurement of the sociocultural concept. The higher education in Russia 10, 80-86 (2014).

[9] Kazantseva, A.N.: Features of development of the market of environmentally friendly production and introduction of ecologically focused innovations in the countries of the European Union. News of the Southwest state university. Series: Economy. Sociology. Management. T. 7, No. 1 (22), 236-244 (2017).

[10] Kalinin, K.D.: Innovations for real estate objects: concept, components (social and ecological). Scientific almanac 3(17), 141-144 (2016).

[11] Nuzhina, I.P., Egorova, O.V., Zolotareva, M.V.: Ecological innovations as a factor of competitiveness of modern construction business. In collection Problems of economics and construction management in an environmentally oriented development. Mat. the second All-Russian scientific and practical online conference with the international participation and elements of school of sciences for youth. pp. 249-255 (2015).

[12] Pakhomova, N.V., Malova, A.S., Titov, V.O.: Efficiency of economy, ecological innovations, climatic and energy policy: subjects of discussions at the international seminar in St.Petersburg State University. Vestnik SPbSU. Ser. 5. Issue 4, 161-172 (2015).

[13] Sklyarova, Y.Y., Yuryev, V.M.: About definition of a category of innovative effect as a basis of import substituting economy of Russia in modern conditions. Socio-economic phenomena and processes. T.11, No. 4, 60-67 (2016).

[14] Rogotskaya, S.: About sustainable development and eco-innovations: new opportunities. URL: http://www.newsland.ru/news/detail/id/678725, last accessed 2018/02/05.

[15] Diesperova, N.A.: The state and development of innovative economy in Russia. RUDN journal of economics 3, 7-16 (2016).

[16] Kuznetsova, A.I.: Infrastructure as a necessary condition for sustainable development of the city's innovative economy. Moscow Witte University Bulletin. Series 1: Economics and Management 1, 45-50 (2012).

[17] Chudinova, Y.N., Vedyakova, M.V., Korotayev, V.N., Kormanovskaya, T.I.: The role of sociological research in the development of a communications company for the sustainable development of the «green university campus of PNIPU». PNIPU bulletin. Applied ecology. Urbanistics 2, 6-20 (2015).

[18] Geng,Y., Liu, K., Xue, B., Fujita,T.: Creating a “green university” in China: a case of Shenyang University. Journal of Cleaner Production 61, 13-19 (2013).

[19] Glukhov, A.P., Bulatova, T.A., Galitskaya, V.A.: Regional discourse of modernization and innovation: from the image of resource-producing territory to the image of an innovative regional center. TSPU Bulletin 11(164), 123-130 (2015).

[20] Eberts, R.: Framework and Tools for Assessing and Understanding the Green Economy at the Local Level. Local Economic and Employment Development. Working Papers, 08 (2011).

[21] From a green jewel, a green economy. Observer. 31 march. www.oecdobserver.org. (2017).

[22] Ivashinina, T.B.: "Green innovations" as factor of economic growth. Relevant directions of scientific research of the 21st century: theory and practice. Voronezh; VGLU. Volume 3, No. 4, 121-125 (2015).

[23] Kiryushin, P.A., Strygina, M.A, Kashirina, E.S.: Assessment of the potential for the implementation of green economy technologies in universities. Moscow University Economics Bulletin 5, 68-86 (2015).