

Editorial article

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SUSTAINABLE DEVELOPMENT AND ENGINEERING ECONOMICS

Irina Rudskaya^{1*} , Dmitrii Rodionov¹ , Tatyana Kudryavtseva¹ , Angi Skhvediani¹ 

¹ Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia,

* Corresponding author: rudskaya_ia@spbstu.ru

Abstract

Environmental issues are currently a topic of interest throughout the world. Regarding further development of the world's socio-economic systems, we must not forget that development is accompanied by additional negative impact that may endanger the lives of future generations. In response to this danger, the Sustainable Development Goals developed by the UN are a kind of call to action to improve the well-being of and to protect our planet. The purpose of the Sustainable Development and Engineering Economics (SDEE) journal is to collect and systematise the opinions of authors and their advanced research in the field of sustainable development of countries, regions and organisations, as well as any related innovative technologies and engineering solutions. The journal consists of four sections, each of which contributes to the Sustainable Development Goals. The SDEE will allow the international scientific community to contribute to the solutions to global problems, even those in distant locations.

Keywords: sustainable development, engineering economics, SDG.

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УСТОЙЧИВОЕ РАЗВИТИЕ И ИНЖЕНЕРНАЯ ЭКОНОМИКА

Ирина Рудская^{1*} , Дмитрий Родионов¹ , Татьяна Кудрявцева¹ , Анги Схведиани¹ 

¹ Санкт-Петербургский политехнический университет Петра Великого, Россия.

* Автор, ответственный за переписку: rudskaya_ia@spbstu.ru

Аннотация

В настоящее время мировое сообщество широко обсуждает экологические проблемы. Говоря о дальнейшем развитии мировых социально-экономических систем, мы не должны забывать, что развитие также сопровождается дополнительными негативными последствиями, которые могут поставить под угрозу жизнь будущих поколений. В этой связи Цели устойчивого развития, провозглашенные ООН, являются своего рода призывом к действиям по улучшению благосостояния и защите нашей планеты. Журнал «Устойчивое развитие и инженерная экономика» (SDEE) ставит своей целью сбор и систематизацию мнений авторов, их передовых исследований в области устойчивого развития стран, регионов и организаций, а также инновационных технологий и инженерных решений. Журнал состоит из 4 разделов, каждый из которых вносит свой вклад в концепцию Целей устойчивого развития. SDEE позволит научному сообществу не быть вдалеке от глобальных проблем, а внести свой вклад в их решение.

Ключевые слова: устойчивое развитие, инженерная экономика, ЦУР.

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About the SDEE

Sustainable Development and Engineering Economics (SDEE) is an international scientific journal that was founded by Peter the Great St. Petersburg Polytechnic University in 2021. It was conceived as a platform for international knowledge exchange about the interrelations between sustainability, engineering economy, engineering infrastructure, management of innovations, management of enterprises and regional development. We expect that papers published in SDEE will fill in the research gaps that occur at the intersections of these topics. Therefore, the results of the papers published in this journal will contribute to the Sustainable Development Goals crafted by the United Nations (UN). The biggest contributions are expected to be made to the following goals: “7: ensure access to affordable, reliable, sustainable and modern energy for all”; «8: decent work and economic growth”; “9: industry, innovation and infrastructure”; “11: sustainable cities and communities”; and “12: Ensure sustainable consumption and production patterns”. The first issue of the SDEE presents contributions in the four main sections of the journal:

- Economics of engineering and innovation decisions as a part of sustainable development;
- Enterprises and the sustainable development of regions;
- Sustainable development of regional infrastructure; and
- Management of knowledge and innovation for sustainable development.

These sections were explored through analysis of scientific literature in the field, the expertise of the editorial board members and leading international journals in this field, including: “Engineering Economics”, “Engineering Economist”, “Sustainable Production and Consumption”, “Journal of Cleaner Production”, “International Journal of Technology Management”, and “Technological Forecasting and Social Change”. Next, we will discuss the content and scope of each section, provide examples of related research written by leading scholars in the field and by members of the editorial board and present contributions to the fields of the papers published in current issue.

Economics of engineering and innovation decisions as a part of sustainable development

This section presents papers that examine the effects of new technology implementation at local and regional levels. In papers that address this topic, we expect researchers to discuss the economic and financial aspects of new technological developments, both for companies and for the regions in which they operate. Such engineering solutions may be derived from any field of engineering, including information-technology engineering. Some of the latest related research in this field discusses, for example, relations between the Circular Economy and Industry 4.0 (Ćwiklicki and Wojnarowska, 2020), micro-level quantification of determinants of eco-innovation adoption (in this example, regarding cotton production in Pakistan) (Zulfiqar et al., 2021) and the economic feasibility of investment in residential photovoltaic systems in Korea considering the effects of that nation’s subsidy policies (Jang et al., 2021).

In addition, scholars can also present papers that discuss how new solutions can reshape both business operations and public services and how these solutions can result in either detrimental or beneficial effects for the complex development of regional territories. See, for example, research dedicated to the emerging challenges and prospects of digital transformation and to the integration of stakeholders in urban land administration in Ethiopia (Gebrihet and Pillay, 2021), to an effectiveness assessment of investments in robotic biological plant protection (Skhvediani and Kudryavtseva,

2020) or to a review of the results of an interconnection analysis of innovativeness, operations priorities and corporate performance (Kilic et al., 2015).

Papers devoted to the development of frameworks and models that support decision-making processes in this field are also welcomed. For instance, Galli (2020) discusses how to effectively use economic decision-making tools in various project environments and throughout project life cycle.

This issue presents the paper “Development of a system-synergetic approach to cost management for a high-tech industrial enterprise”, which was written by Ekaterina Burova, Sergey Grishunin and Svetlana Suloeva. They present a system-synergetic approach to cost management and a mechanism for its implementation in high-tech industrial enterprises. Their approach allows high-tech industrial enterprises to calculate risks as well as measure correlation between them and the profitability of innovative products. Enterprises can also use this approach to more flexibly manage their innovation product portfolios and to ensure the sustainability of their operations.

Enterprises and the sustainable development of regions

The focus of this topic is the general impact of enterprises on the sustainable development of different regions around the globe. Therefore, we shift focus from precise technologies to enterprises and industries. See, for example, how Small and medium-sized enterprises (SMEs) maintain sustainable practices in Sweden (Tsvetkova et al., 2020).

We invite scholars to submit papers that present the systematic results of research on sustainable business models and on sustainable industry development. Emerging trends in sustainable manufacturing in Industry 4.0 can be found in the work of Machado et al. (2020).

This research might also contain assessments of the direct and indirect effects of certain companies and of industrial development in general. Direct effects should be measured through evaluation of the concrete damages or benefits that are generated by these companies. We also welcome papers that assess the different types of spillover that can be generated by enterprises, economic clusters, industries and global value chains. This spillover may occur in a variety of areas — including environmental, social and governmental (ESG) – and within corporations, knowledge or technology. Recent studies have explored cross-country evidence to determine if technological innovations reduce CO2 emissions (Chen and Lee, 2020) and firm-level evidence of technological spillover effects through industrial and regional linkages (Hu et al., 2020).

In addition, we expect authors to discuss the impact of regional policies and special economic regimes on enterprise development. Industry-specific research is also welcome; we look forward to reviewing studies related to, for example, energy economics, strategy and policy. Recent examples include research that contributes to the topic of clean energy development in the United States amidst augmented socioeconomic aspects and country-specific policies (Alola and Akadiri, 2021) and an analysis of technology diffusion policies for renewable energy (Bianco et al., 2021).

The current issue presents two papers in this section.

The first paper is entitled “Validation of factors for assessing the digital potential of the regional construction complex as a basis for sustainable development” and was written by Ekaterina Tereshko, Irina Rudskaya, Mario Claudio Dejaco and Sofia Pastori. This research presents an extensive review of the existing indexes that can be used to assess the digitalisation of a regional construction complex, and it presents an adjusted sample of factors for assessing the digital potential of that complex. These factors can also be used to manage and assess sustainable development in the region.

The second paper, “Sustainable business models and small- and medium-sized enterprises A literature review”, was written by Susanne Durst, Basel Hammada, Hoa Nguyen and Martin Moieny Asl. This paper presents the results of a review of 85 refereed articles and provides highlights of the most prominent topics and possible future research avenues, the main findings and the methods and theories that have most commonly been applied in the field. This review is useful for practitioners who are considering the adoption and promotion of sustainable business models in organisations.

Sustainable development of regional infrastructure

This topic is dedicated to research that discusses the role of different types of infrastructure – physical, innovation, digital, smart, financial, transportation and entrepreneurial – in the sustainable development of regions and enterprises. We expect authors to identify and assess the effects of infrastructure development on different aspects of economic, innovative, social and environmental regional development. Accordingly, we are open to submissions on topics such as waste management, smart logistics systems and smart cities, among others. Good ideas about sustainable construction investment can be found in the review by Kaklauskas et al. (2021). Another example of recent literature related to infrastructure is that by (Berawi et al., 2018), which discusses a concrete case of life cycle cost and public-private partnership in the development of the Walini City Technology Park. In addition, an analysis of special economic zones and industrial park development for the promotion of industrial clusters is presented by Sosnovskikh (2017).

The current issue presents two papers in this field.

The first is a paper entitled “Balance scoreboard for sustainable development in the Russian Arctic zone”, which was written by Svetlana Gutman. The author provides a comparative analysis of the modified Balanced Scorecard models that can be used to manage the development of socio-economic systems. This study also develops strategic maps for the Arkhangelsk region and for the Cluster of Shipbuilding and Production of Marine Equipment of the Arkhangelsk region association.

The second paper, entitled “Analysis of territory energy security in the context of sustainable development (case of Georgia)”, was written by Tengiz Magradze. The author provides a toolkit which allows for comparison of energy security level between different territories and for identification of influencing factors. Application of the proposed toolkit to the case of Georgia revealed that the energy security level of this country had decreased since 2008. The author concludes that the decrease has been negatively affected to sustainable development in the region.

Management of knowledge and innovation for sustainable development

Innovations help companies to avoid stagnation and foster economic growth. Usually, the focus of innovation is centred on the economic aspect of sustainability, but it can also be expanded to encompass both social and environmental aspects.

Innovation management is the structuring of a specific innovation process with a beginning (input), a middle (processing) and an end (output and generation of results). Innovation management involves establishing the means and methods to generate value and putting ideas into practice. This will usually lead to an organisation’s productive, operational and managerial processes being updated, rationalised or, sometimes, disrupted.

This can improve outcomes for an organisation by making the services or products provided to customers more attractive and effective. Research in the area of this topic should contribute to innovation management at individual, enterprise or regional levels. Authors might also consider the relationship between universities and regional innovation development (Rodionov and Velichenkova, 2020).

We welcome papers that discuss both closed and open innovation models and their contribution to the achievement of sustainable development, as well as cluster analysis (Anguelov and Kaynakchieva, 2017). For example, the impact of a firm's commitment to learning and open-mindedness on its organisational innovation among Russian manufacturing firms (Dukeov et al., 2020) would be an interesting topic for further examination.

One article in the current issue, entitled "Clustering of territorial objects in the management of their sustainable development", focuses on innovation. It was written by Dmitrii Rodionov, Dmitrii Alferyev, Yulia Klimova and Kaisar Alpysbayev, who examine the tools of clustering territories. The authors emphasise that the cluster analysis can be beneficial to the sustainable development. Moreover, using the perceptron model, the authors have developed a universal algorithm for cluster analysis of territories. They claim that through this algorithm we can implement innovations in practice that will be one of the factors of socio-economic progress.

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About the authors

1. Rudskaya Irina Andreevna, Doctor of Economics, Professor, Graduate School of Engineering and Economics, Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia, <https://orcid.org/0000-0002-9953-6619>, rudskaya_ia@spbstu.ru
2. Rodionov Dmitrii Grigorievich, Doctor of Economics, professor, Head of Graduate School of Engineering and Economics, Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia, <https://orcid.org/0000-0002-1254-0464>, drodionov@spbstu.ru
3. Kudryavtseva Tatiana Yurevna, Doctor of Economics, professor, Graduate School of Engineering and Economics, Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia, <https://orcid.org/0000-0003-1403-3447>, kudryavtseva_tyu@spbstu.ru
4. Skhvediani Angi Erastievich, Ph.D. in Economics, senior lecturer, Graduate School of Engineering and Economics, Peter the Great St. Petersburg Polytechnic University, Saint Petersburg, Russia, <https://orcid.org/0000-0001-7171-7357>, shvediani_ae@spbstu.ru

Информация об авторах

1. Ирина Андреевна Рудская, д.э.н., профессор, Высшая инженерно-экономическая школа, Санкт-Петербургский политехнический университет Петра Великого, Санкт-Петербург, Россия, <https://orcid.org/0000-0002-9953-6619>, rudskaya_ia@spbstu.ru
2. Дмитрий Григорьевич Родионов, д.э.н., профессор, директор Высшей инженерно-экономической школы, Санкт-Петербургский политехнический университет Петра Великого, Санкт-Петербург, Россия, <https://orcid.org/0000-0002-1254-0464>, drodionov@spbstu.ru
3. Татьяна Юрьевна Кудрявцева, д.э.н., профессор, Высшая инженерно-экономическая школа, Санкт-Петербургский политехнический университет Петра Великого, Санкт-Петербург, Россия, <https://orcid.org/0000-0003-1403-3447>, kudryavtseva_tyu@spbstu.ru
4. Схведиани Анги Ерастиевич, к.э.н., доцент, Высшая инженерно-экономическая школа, Санкт-Петербургский политехнический университет Петра Великого, Санкт-Петербург, Россия, <https://orcid.org/0000-0001-7171-7357>, shvediani_ae@spbstu.ru