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## DEVELOPMENT OF PATENTING IN COAL INDUSTRY

### Introduction

High industrial investment activity is one of the determinants of economy growth and social welfare in a country. Industrial modernization in Russia needs structural transformations involving investment expansion and shaping of investment policies. The problem consists in development of practical guidance on introduction of information technologies in the production and specification of milestones of the investment policy.

In coal industry, practical application of innovations is ensured by company's investment effort which is one of the categories of the company business activities and a major way of actualization of economic interest [1–3].

Industry calls for modernization and modification in technique and technology. It is beneficial to diversify activity, to create fuel-and-energy supply units based on operating mines and to adhere to comprehensive utilization of mineral resources. Russia is one of the top coal producers in the world. It holds one-third of the world's geological reserves of coal and the fifth part of known reserves — 193.3 Bt [4]. Given the current level of coal mining, these reserves are enough for operation for more than 550 years [5]. In 2017 Russia produced 407.8 Mt of coal, which is 7.15% higher than in 2016. The dominating method of coal extraction is open-pit mining. In 2016 open-pit mines produced 281.1 Mt of coal (4% increment as against 2015). Currently, the industry enjoys large-scale investment (to 90 billion rubles). At the present time, coal is extracted in 16 basins embracing 85 municipal formations (58 out of which are coal mining regions arisen around coal mines).

The domestic and foreign coal mines are faced with the same challenges of environmental protection, mining safety, and improvement of coal quality through higher level preparation as well as enhancement of economic efficiency [6, 7]. Acuteness of the problems and urgency of solutions are different at each specific mine.

### Patenting — protection of intellectual property of a company

Management practice shows that unprofitability of many coal companies is caused by both external factors and, in a great measure, internal factors connected with insufficient control, unreasonable diseconomy of coal mining and the absence of mechanisms for effective use of available potential. A reform policy in coal mining should focus on support of potentially competitive mines [2].

*This article discusses priority ways to meet innovation challenges of the coal industry in Russia. Given the common objectives, Russian and foreign inventors often follow different routes in the field of creative efforts. Majority of patents abroad belong to engineering of mining equipment and methods of its application. In Russia, patents mostly protect methods of mining meant, as a rule, for specific conditions of certain deposits, or methods of using certain equipment in different conditions.*

*The analysis of innovation activities of companies in Russia and in EU member countries shows that the share of Russian companies implementing technological, marketing or organizational innovations is much less than in the countries of the Western Europe. Most of Russian patents concerned with the coal industry deal with the underground mining methods. Creative efforts of Russian inventors are mainly directed at improvement of the current technique.*

*The authors make proposals on financial backing of innovation projects in the coal industry based on the mutually beneficial public–private partnership. Further development in the coal industry assumes revolutionary re-engineering in the area of coal mining, haulage and use. One of the ways to get out of economic depression is the search and exploration of new technological and marketable niches for creation and manufacture of competitive products under absolute patent protection.*

**Key words:** coal industry, investment, innovation activity, patents  
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The problems of economic and technological development in Russia are more sharply discussed now in view of the recent events: economic sanctions, dramatic devaluation of Russian ruble, and rising geopolitical tensions. Under external pressure, the problems of import substitution, reorientation of Russian economy from income from raw materials to revenue from non-primary production, and technologization stimulation come to the spotlight. Integrated coal preparation will allow the most effective use of its energy value and help combating principal defect of the coal industry — environmental pollution [8, 9].

Intellectual activity consists of such basic processes as: research and development, mastery, small- or large-scale production and use. The active legislation in Russia, in particular, pays much attention to definition of innovation activity. The law treats innovation activity as activity, including scientific, technological, organization, financial and commercial activities, aimed at implementation of innovation projects, formation of innovation infrastructure and provision of its performance. The information on intellectual activity of an organization is considered as an object of the governmental statistical monitoring.

Single-purpose use of coal is so ecologically maleficent that it is urgent to revise all existing technologies worldwide, considering new advanced processes which ensure ecological cleanness of coal production without precleansing of available resources, first and foremost, solid combustibles. Nano-

modification of fuel preparation will enable reduction in concentration of harmful substances in composite fuel and, thus, will decrease their atmospheric emission. Russian and foreign investors are very much interested in the coal industry; however, majority of inventions is only a slight improvement of the current technical level.

For this reason, the only way to overcome this destructive situation is patenting of innovations aimed to boost commercial viability and safety of coal production. Patenting activity is to a certain degree characterized by the number of patents granted in different branches of economy. For instance, patents issued in the International Patent Classification categories of construction and mining make 6%. In 2016 Russia had 26795 patent claims from national applicants.

Before getting a patent for useful invention, an applicant should carry out patent research in order to determine the want and the practical relevance of a discovery in the coal industry. To this effect, it is required to be an expert in coal mining and, also, to know perfectly the twists and turns of the patenting process. Eventually, to be in touch with the innovative science and technology, it is necessary to read regularly patent literature. Index of patent classification for a specific invention is determined by an author and (or) a patent office expert so that the patent classification error is minimized [10].

A possessor of right, to preserve competitive capacity, should in due time to patent innovations, technologies or discoveries. At the present time, an inventor is again conferred exclusive intellectual property rights, and it is critical that a patentee is re-granted the right of independent commercialization of an innovation.

In view of the high market competition, it may often happen that different researchers come to the same inventions at the same time approximately, and, therefore, each researcher seeks to register an invention.

Intellectual property is now under control of the strong legislation that has many provisions similar to international standards. Russia operates a series of special legally enforceable enactments—Patent Law, Trademark Law, and various guiding documents on program products, etc. At the same time, innovation projects are properly implemented only by a few private bodies and research communities which themselves are engaged in creation, promotion and marketing of Hi-Tech products. Aside from the areas connected with introduction of continuous flow process technology, patents concerned with mitigation of ecological impact of mining are of interest. In this regard, it is significant that inventors address these issues comprehensively, as a part of enhancement of innovation efficiency and mining safety [11–13].

The patent right (invention, or a useful model, or a production prototype) belongs to an inventor.

As per article 1357 of the Russian Civil Code, a claim right can be transferred in the order of universal legal succession subject to conditions set by the labor contract with an inventor, on the basis of contract on alienation of rights to obtain a patent, and in some other situations.

The primary purpose of getting a patent is protection of intellectual property in the form of an invention or an “idea”. Patent protects from endeavors of third parties as information on inventions often becomes accessible yet before legal safeguard is set in the form of a patent and can appear in the industry, exhibition, mass media, etc.

It is worthy of mentioning that, although common objectives, Russian and foreign inventors often follow different

routes in the field of creative efforts. In such countries as Germany or USA, majority of patents belong to engineering of mining equipment and methods of its application. In Russia, patents mostly protect methods of mining meant, as a rule, for specific conditions of certain deposits, or methods of using certain equipment in different conditions [14, 15].

A patent value depends on the stage of an intellectual property object (stage of laboratory testing, pilot experimentation or full-scale industrial use), study of new product market, promotional activities, etc. The patent information is basically trans-national, i.e. available to the whole world and is scrutinized by all science and technology community since the international novelty of an invention is proved through the expertise of the worldwide patent collection. Thus, patenting is an important instrument of intellectual property protection.

### Innovation activity in the energy industry

The requirement to put up capital in innovations and the absence of any tax advantages in introduction of patentable inventions will continue to hinder technological development, especially when payback of new technologies is a long period. In trading and finance sectors, turnover of capital is much faster and profitable for rate of growth is by far higher. Innovation process is a far lot more complex, risky and long-term. For this reason, capital is naturally forwarded to more revenue sectors of economy. Long-term investment of hi-tech projects is insufficiently stimulated. Leading Russian companies prefer to buy foreign equipment and technologies rather than to attend to in-home invention and patenting. Russian inventors direct their creative efforts mostly to improvement of methods of using available technique. Patent activity is disproportionately low as compared with the production and export level. For instance, in 2016 aggregate innovation activity in Russia was 10.7% while it made 63.5% in Austria, 69.9% in Belgium and 67% in Germany.

### Conclusion

Thus and so, the problem of sustainable competitive capacity in innovation and patenting in the coal industry has many aspects. To make hi-tech development gainful for Russian businessmen, governmental preferences are required. Therefore financial backing of innovation projects should rest upon mutually beneficial public–private partnership. Foreign businessmen are highly interested that the Russians make the lowest investment in intellectual property and do their best to prevent economical stabilization in Russia. In the article authors’ opinion, intellectual property should be a business navigator in the international product market. Safety and efficiency of innovation production will make the coal industry profitable and, moreover, will help preserve invaluable health and lives of people.

### References

1. Zholobova Yu. S., Kushchiy N. A., Savon D. Yu., Safronov A. E. Minimization of ecological impact by application of new technologies of coal preparation and mining waste disposal. *Gornyi Zhurnal*. 2016. No. 5. pp. 109–112. DOI: 10.17580/gzh.2016.05.18
2. Kuzubov S. A. Limitations of Intellectual Property Rights and Patent Risk. *Economics and Management of Innovative Technologies*. 2014. No 10. Available at: <http://ekonomika.snauka.ru/2014/10/6142> (accessed: 20.02.2018).

3. Peshkova M. Kh., Savon D. Yu. Mechanism of the government and private business partnership in ecological-and-economic appraisal of mining waste. *Gornyi Zhurnal*. 2016. No. 10. pp. 37–41. DOI: 10.17580/gzh.2016.10.07
4. Russian Statistical Yearbook 2017. Moscow: Rosstat, 2017. p. 686.
5. Russia and the countries members of the European Union: Statistical Yearbook 2017. Moscow: Rosstat, 2017. p. 264.
6. Tulupov A. S. Compensation for environmental damage in the economy of mining. *Gornyi Zhurnal*. 2017. No. 8. pp. 61–65. DOI: 10.17580/gzh.2017.08.11
7. Zhaglovskaya A. V., Savon D. Yu., Safronov A. E., Sidorova E. Yu. Production activity analysis Methodology for open pit coal mines (in terms of Shestaki open pit mine). *Eurasian mining*. 2017. No. 1. pp. 14–16. DOI: 10.17580/em.2017.01.04
8. Samarina V., Skufina T., Samarin A., Baranov S. Some System Problems of Russian Mining Enterprises of Ferrous Metallurgy. *International Review of Management and Marketing*. Special Issue for «Socio-Economic and Humanity-Philosophical Problems of Modern Sciences» 2016. Vol. 6(S1). Available at: <http://econjournals.com/index.php/irmm/article/view/1882/pdf> (accessed: 28.04.2018).
9. Samarina V. P., Skufina T. P., Samarin A. V., Baranov S. V. Some Problems of Anti-recessionary Public Management in Russia at Present. *Management of Systems of Socio-Economic and Legal Relations in Modern Conditions of Development of Education and Society*. 2016. Vol. 6. No 6S. Available at: <http://econjournals.com/index.php/irmm/article/view/2917> (accessed: 28.04.2018).
10. Somaya D. Strategic determinants of decisions not to settle patent litigation. *Strategic Management Journal*. 2015. Vol. 24. No. 1. pp. 17–38.
11. Gilbert R., Shapiro C. Optimal Patent Length and Breadth. *RAND Journal of Economics*. 2014. No. 21. pp.10–14.
12. Klemperer P. How Broad should the Scope of Patent Protection Be? *RAND Journal of Economics*. 2014. No. 21. pp. 15–19.
13. Gallini N. T. Patent Policy and Costly Imitation. *RAND Journal of Economics*. 2013. No. 23. pp. 9–12.
14. Kamien M. I., Schwartz N. L. On the degree of rivalry for maximum innovative activity. *The Quarterly Journal of Economics*. 2015. No. 3. pp. 24–27.
15. Denicolo V. The optimal life of a patent when the timing of innovation is stochastic. *International Journal of Industrial Organization*. 2016. Vol. 17. No. 6. pp. 27–36. 

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## AUTHORS' APPROACH TO THE TOTAL ECONOMIC VALUE: ESSENTIALS, STRUCTURE, EVOLUTION

### Introduction

One of the key problems of the international, national and regional economic regulation from the viewpoint of the management ethics is economic determinism dogmatizing self-adaptive “system rationality” cultivated by the ideal liberal economic theory of a “free” market based on shareholder value. In the meanwhile, reproduction of renewable and nonrenewable natural resources in the conditions of the globally exacerbated race for control over mineral wealth and the environmental degradation spotlights the problems of the analysis and appraisal of natural resources not from the standpoint of subsoil assets, or Populism, or a package policy but in the system approach in the framework of socio-ecological-and-economic problematics. Human society starts to realize that the nature and the environment are not simply the sources of exchange value of resources for public production but also have consumption value governing development of the mankind [1, 2]. The ecological-and-economic problematics dictates considering natural resources as a part of ecosystems with regard both to their exchange value and ecosystem functions. To that end, at the current stage of the ecological-and-economic science, the concept of total economic value is highly pre-

*Total economic value concept operates as a consistent approach for economic evaluation of natural resources in the context of exacerbation of the ecological crisis and overexploitation of natural resources. However, the essence and structure are still the subject of scientific research. This article determines that along with the existence of subjective, ideal and real values, the subjective values are the most interesting from the point of view of economic evaluation and distribution within the framework of the total economic value concept. The presented genesis of the term of “value”, analysis of the total economic value concept development and the theory of ecosystem services contributed to the creation of an author’s approach to the distribution of values. We justify the inclusion in indirect value the cultural services as opposed to the direct value; option value takes into account the value in use by future individuals; we remobilize the quasi-option value in the structure of total economic value. The paper provides an improved total economic value model. This model takes into account the time aspect, the understanding of the term “value” and theoretical principles of ecosystem services and author’s principle of value evaluation – “based on the best possible alternative”. The practical implications of the research is to improve the economic mechanism of government regulation of natural resource management by clarifying and improving the consistent basis for the economic evaluation of the value of natural resources for making managerial decisions on their involvement in economic turnover.*

**Key words:** total economic value, essence, structure, evolution, ecosystem services, natural resource

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vailed as the most complete mineral wealth assessment procedure which allows accounting for natural resources within ecosystems. The system approach is to date the most widespread and promising technique in economic, social [3] and