

---

## Methods and Tools of Scenario Planning in Areas of Natural Resources Management

---

Alexey Evgenievich Cherepovitsyn<sup>1</sup>, Alina Alexandrovna Ilinova<sup>2</sup>

**Abstract:**

*The article considers basic theoretical and methodological approaches to scenario planning. The comparative analysis is made in relation to the traditional and scenario approaches to strategic planning. The urgency of applying methods and tools of strategic planning in the mineral resources sector is stipulated.*

*Peculiarities of applying the scenario planning in the context of the mineral resources sector areas functioning are revealed. The block diagram of comprehensive strategic analysis as the first stage of the scenario planning to develop economic systems is shown.*

*The research results support three of the basic scenarios of developing the mineral resources sector as a large system forming a general economic system.*

*These scenarios are characterized in terms of general macro- and microeconomic prerequisites of applying them, basic economic factors that characterize them, peculiarities of state regulation under this development scenario, basic parameters of social and economic development and state, of the mineral resources sector.*

**Keywords:** *Scenario planning, mineral resources sector, mining companies, scenarios, strategic management, strategic analysis.*

**JEL Classification:** *O10, O13.*

---

<sup>1</sup>Saint Petersburg Mining University, [alekseicherepov@inbox.ru](mailto:alekseicherepov@inbox.ru)

<sup>2</sup>Saint Petersburg Mining University, [iljinovaaa@mail.ru](mailto:iljinovaaa@mail.ru)

## 1. Introduction

In the context of high volatility in the markets of mineral raw resources, the forecast for the development of these sectors and companies becomes important and at the same time a difficult task. In this context the most adequate tool to forecast the development of sectors and companies of the mineral resources sector is based on scenario planning.

Scenarios of developing the mineral resources markets and the mineral resources sector is possible by choosing the most basic strategy of the state in the area of natural resources management or sub-area of the mineral resources sector and to form a promising plan or a comprehensive program for its long-term development. Such grand scenarios of developing markets and the complexity associated with them is possible, however it must be an efficient and reasonably possible scenario. It must be based on general benchmarks of the sector development and be competitive with others. Scenario planning allows managers of all levels to adapt various variants of developing macro-economic parameters and events on the markets of mineral raw materials, and to have certain solutions and alternative variants of development.

## 2. Literature Review

The concept of scenario planning as a new method of forecasting had been formed in the 1960s. In the late 1970s scenarios were used by researchers of the Stanford Research University such as G. Khan (xxxx), T.S. Gordon (xxxx) and O. Helmer (xxxx). The opportunity to use scenarios as a basis of development when developing strategic solutions was considered by researchers such as D. Bell (xxxx), M. Merkhofer (xxxx) and M. Lidgren (xxxx).

Kahneman and Tversky (xxxx) researched the psychological basics of scenarios. Porter (1998) studied the use of scenarios in terms of creating the economic prospects of developing an enterprise. Ringland (2008) studied them in terms of developing a business strategy of an enterprise (Laeva, 2006; Kees van der Heijen, 1996; Kees van der Heijen, 1997). There are various approaches defining such notions as “scenario” and “scenario planning”. For example, according to Porter (1998), it is necessary to define scenario planning as “*an internally non-contradictory view at what the future may be*”. Schwarz (1991) defined scenario planning as “*A tool to regularize the existing ideas about possible terms and conditions of the activity in the future where the taken decision will be correct*” (Schwarz 1991; Fahey and Randall 1998).

According to Ringland (2008), scenario planning solves tasks on managing the indefiniteness that may happen in the future. Thus, scenario planning is “*an element of strategic planning based on ways and technologies of managing indefiniteness of the future*”. Shoemaker (1980) defined scenario planning as “*a*

*rational method of representing probable variants of the future where decisions taken by the organization can be implemented*". Aaker (2002) stated that scenarios are a way to analyze complicated environment where there are many important and interacting tendencies and events.

At the modern stage it is possible to say that it is urgent to study scenario forecasting and planning due to the growing indefiniteness related to the activity of economic subjects. Today many companies acknowledge the need to take into account the factor of indefiniteness when developing a strategy of the organization development, which stipulates the increasing number of publications on this theme.

### **3. Methods**

#### **3.1 Theoretic Basics of Scenario Planning**

Scenarios are possible variants of the future development of events. They help the company management to perform the strategic vision. It is important to consider that it is necessary to base the scenario on many objective factors the company management and state governmental structures cannot influence (Bretsman 2011). Scenario planning includes not only the formation of scenarios but also a complex of management solutions, actions and measures within strategic planning (Lindgren 2011; Frolova *et al.*, 2017; Bashmakov *et al.*, 2015).

According to Kahn (1976), a general strategic long-term tendency that describes the development of the external environment is an important notion in scenario planning. The extrapolation of tendencies within the logics of "general tendency" causes the development scenario. Besides, several variations based on realistic opportunities of the system development and forming strategic alternatives are substantiated. Under scenario planning, Kahn (1967) has mentioned the dynamics of qualitative indicators and used the retrospective approach to functioning and developing the systems. This is how scenarios move from a hypothesis to facts. Thus, according to Kahn (1967), scenarios are a hypothetical succession of events used to study causal relationships and resulting in taking strategic decisions.

In an economy scenario planning being used after the Royal Dutch Shell Dutch and British Gas and Oil Company applied multivariate strategies of development in the 1960s. The development of strategies by the Shell Company allowed to avoid many consequences of the oil crisis. The company managed to earn profit from the crisis and to form a new competitive advantage in the management system. As a matter of fact, since this moment they have started using methods of scenario planning applied to estimate the degree of business independence on various factors. Scenario planning, similarly to traditional planning, starts from defining what can and cannot be forecasted. At the same time the scenario goes beyond the predictability and possibility to form clear areas of actions and models. The task of scenario planning is to understand general tendencies that can form the general structure for scenarios.

Then it will be possible to offer several variants of the future development within such structure. Scenario planning is related to the idea of developing and supporting sustainable functioning of the company under ambiguous, changing conditions. It can be applied on various levels. In their researches J. Ogilvy (xxxx), P. Schwartz (xxxx), G. Michel (xxxx), L. Fahey (xxxx), R. Randall (xxxx), R. Miller (xxxx) and K. Heijen (xxxx) described basic principles and rules of forming scenarios, peculiarities of organizing a process of strategic planning, as well as revealed the most frequent mistakes. Table 1 shows comparative characteristics of traditional and scenario approaches to the strategic planning.

**Table 1.** Comparative Analysis of Traditional and Scenarios Approaches in the Strategic Planning

Parameters of comparison	Traditional approach	Scenarios approach
Ideas about the future	It is easy to predict the future (or at least it is possible to do it) by studying statistical data subject to their availability, extrapolating the existing tendencies and using expert opinions.	Various factors of volatility of the global mineral raw resources markets that are indefinite in the modern economy have an impact on the future.
Principles of formation	The strategy is created as a certain time horizon and specified in the strategic plan that must be implemented and controlled by management in accordance with the defined algorithm.	It is reasonable to form scenarios of possible variants of events development in the future, then formulate strategic alternatives that are adaptable and efficient in every competitive scenario. Then a flexible multivariate strategy is formed.
Strategic solutions	There are basic classical best strategic solutions based on the analogous ones that have already been implemented and given positive results.	The strategy that has already been implemented and given a good result does not mean it is successful. In case of large indefiniteness, risky and responsible strategic solutions can be delayed until new information about the macro-environment.
Implementation	After forming a strategic plan, it is implemented.	The strategy transforms into a complex of interactive strategic solutions that have certain flexibility and can relatively quickly change over one scenario to another.

### 3.2 Peculiarities of Applying Scenarios in the Mineral Resources Sector

In the context of high volatility of mineral raw resources markets and sudden changes of macro-economic, political, technological and social factors of the macro-environment, it is unreasonable to develop a strategy focused on the sole forecast that seems the most probable to the companies' management or state structures that

carry out strategic planning of the development of areas of the mineral resources sector. In the modern economy there are uncontrolled and weakly controlled sudden macro-economic, social and political changes, changes related to technological revolutions, as well as events that can hardly be predicted. In the environment that is difficult to predict, there are always many possible variants of the future development (Pociovalisteanu *et al.*, 2010).

Scenario planning in the mineral resources sector is designing, creating various trends of the mineral resources potential development, mineral resources markets and technological factors that define the activity of companies of the mineral resources sector that must be well structured and logical. Under such approach the strategy acquires the required flexibility and adaptability to changes. This is how the company gets additional opportunities to maintain, strengthen and develop its competitive advantages in the context of various variants of the events development. During the strategic management in the mineral resources sector, scenario planning makes it possible to:

- Better understand the dynamics of changes of prices for raw material resources;
- Better understand possible changes in the conduct of main market members;
- More accurately forecast basic changes in the environment;
- Define the sensibility of various sectoral complexes to changes of macro-economic factors and other factors of the environment;
- Define opportunities on using the current potential of the company or sector by specifying the most important and implemented ones.

### **3.3 Approaches to Scenario Planning**

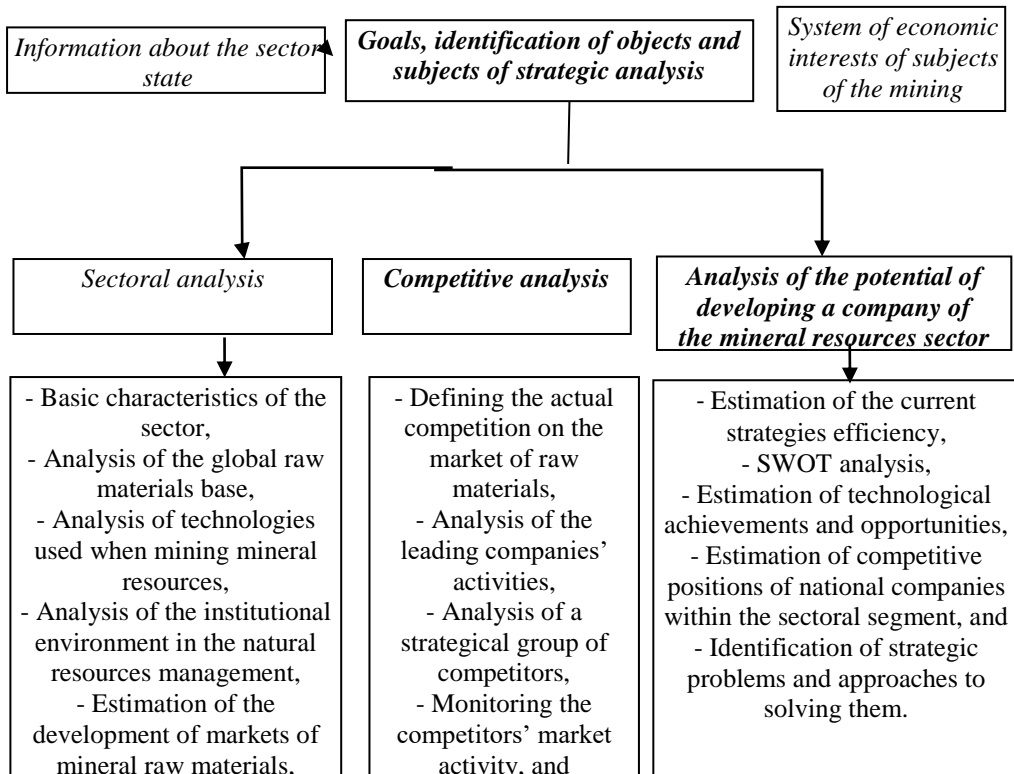
Like in strategic planning, scenario planning starts from strategic analysis of macro- and micro-environment. Then there is a stage when scenarios are directly developed. Generally, the conclusive stage of the scenario planning is the development of strategic alternatives within every scenario and formation of the integrated strategy of the research object development. Strategic analysis can result in making a list of factors of the macro-environment that have a serious impact on the sustainable functioning of various companies during a certain period.

Figure 1 shows the block diagram of the complex strategic analysis for companies of the mineral resources sector. It contains analytical information for three groups (Ilinova 2014; Dmitrieva 2016; Zedgenizova and Ignatyeva 2017; Titova, *et al.*, 2017):

- ✓ Analysis of the sector.
- ✓ Analysis of competitor-companies.
- ✓ Estimation of the potential of developing the mineral resources sector.

In accordance with the block diagram below, it is reasonable to make a strategic analysis for the further formation of the development scenarios for the company, including companies of the mineral resources sector.

**Figure 1.** Block Diagram to Make Comprehensive Strategic Analysis



The development of scenarios is a long and creative stage of scenario planning that includes a selection of variables, designing various scenarios results, systematization, and stipulating of the selected variables and describing scenarios.

When selecting variables, it is necessary to study the results of the made analysis of the external environment to find out especially important factors that will make up a basis for scenarios. It is important to objectively estimate events when stipulating scenarios and specify the time horizon. Brainstorming and cause-and-effect diagrams are used as the method of variables selection. As a result, a few of the most valuable variables (characteristics) that differ from one another are selected. By designing various scenarios, it is reasonable to analyze the offered variables (characteristics) and to define two or three possible results (hypothesis of events development). Every variable must have its alternatives within the formulated

hypothesis (result). It is important to consider the events that may happen even if the effect from these events is not obvious.

When systemizing and stipulating the selected variables and describing scenarios, it is necessary to determine the interrelation between the stipulated results of the offered variables. Besides, it is necessary to describe the scenarios themselves. As a result, 709 systemized results are formed for various variables (characteristics) (Bourgeois 1998; Ogilvy, 2002; Ogilvy and Schwartz 2004). Then the obtained mini-scenarios are united, and generally it results in 2-3 enlarged scenarios of developing the economic object. It is the most clear and feasible to formulate and describe the most probable, optimistic and pessimistic scenarios of the enterprise (sector, market) development. It is often offered to use two basic scenarios where positive results of the key variables are included in the optimistic scenario, and unsuccessfully are included in the pessimistic scenario. It is very important to estimate the developed scenarios by all interesting parties.

Thus, the scenario method makes it possible to develop an optimal combination of strategies, which contributes to achieving a better result during the strategic management within the enterprise, sector, or any other economic system. Every scenario under consideration must comply with the most suitable strategy of the system development that can maximize the result of the management object activity. At the same time such strategy must ensure a low risk.

There are many methods of developing and selecting scenarios, such as the obtaining an agreed opinion, the procedure of independent repeated scenarios, or the matrix method of interrelation (Eddous, 1997). It is possible to single out both advantages and disadvantages of every method. The method of obtaining an agreed opinion is close to the Delphi method. It aims at obtaining a collegial estimation of various groups of experts about important events in a certain area of the activity within the determined period of the future. It is possible to specify such disadvantages of this method as insufficient attention to the research of dependence, interrelation and change in the dynamics of various macro-economic, geo-political and technological factors that have a great impact on the internal environment of the company.

The development of scenarios on areas that have a considerable impact on the development of external and internal environment of the company is a basis of the method of the repeated unity of independent scenarios. Within this method there is a repeated iterative process of agreeing scenarios. Advantages of these scenarios are the detailed analysis of the interrelation of various factors and reasons of the situation development. However, a weak level of development and low provision of the scenarios agreement says about its weak points.

The inter-influence matrixes method developed by Gordon and Helmer (xxxx) is based on expert estimations of possible inter-influence of events from the ones

under consideration (Gordon 1968, Helmer 1977; Godet 2001). The estimations that systemize all combinations of events by their power and time allocation make it possible to detalize the initial estimations of the events and their combinations probabilities. The difficulty in obtaining many estimations and processing them correctly says about the disadvantage of this method. However, this method allows understanding the management object under analysis, basic regularities and peculiarities of its development.

#### **4. Results**

The mineral resources sector can be represented as a dynamically developing economic system that includes several subsectors. Every variant of the complex development scenarios fixes certain dynamics of changing volumes of production and processing of mineral raw materials based on the combination of possible development conditions. The scenario approach makes it possible to consider the whole variety of macro-economic and technological conditions. Without giving details, in most cases it is sufficient to describe alternative variants of developing the country's or region's mineral resources sector by three scenarios – slow-response, evolutionary, and innovational.

The slow-response scenario does not include active state policy in natural resources management. The point, not always sequential economic policy is pursued. The state supports mining enterprises according to the selective principle. Prospects of the sector development are defined mainly by external factors of the global economy and financial opportunities of the state.

The evolutionary scenario means that the structure of the mineral resources sector will be reconstructed by modernizing and extending the existing productions, and in the medium term an active investment strategy will start. This investment strategy is focused on comprehensive extraction of valuable elements from the produced mineral raw materials and exploration of non-traditional channels related to resources. The innovation strategy of the state development is implemented. It is focused on priorities of the technological development of extractive industries. The scenario aims at the evolution of the sector and its transfer to the innovation and technological development.

The innovational scenario means a sharp increase in investments in mining, and above all in processing capacities. Promising surveys are activated. The innovation infrastructure is formed everywhere, and a lot of small innovational enterprises that develop and approbate new mining and processing technologies are established. When equipping mining productions, intellectual systems of deposits management are actively implemented (Berezina 2014). Technologies that allow to comprehensively extract valuable elements are widely used at mining enterprises. It is possible to observe the rapid development of energy-saving mining productions



that use combined sources of energy, including the increase in using the renewable energy. Table 2 shows a more detailed characteristic scheme of these scenarios.

**Table 2. Comparative Characteristics of Scenarios for the Mineral Resources Sector**

General economic prerequisites	Economic factors and state regulation	Social and economic development	State of the mineral resources base
<b>Slow-response scenario</b>			
<p>Non-sustainable macro-economic parameters, crisis phenomena, budget deficit, focus on export of mineral raw materials and import of technologies</p>	<p>Production of raw materials advances its reproduction; innovation development is elementary. The institutional policy in natural resources management is developed slowly. The inflow of foreign investments is small. Low tempos of productions modernization. The maintenance of long-standing tempos of the growth and fall of mineral raw materials production is forecasted. It is possible to observe a process of degradation of some mining regions and out migration.</p>	<p>There are disproportions between various sub-sectors of the sector by the level of economic efficiency and their contribution in budgets of the region and country. Misbalance between the dynamics of economic development and tempos of the increasing level of the population's life is possible. The decrease in the level of social welfare in mining regions is possible. The ecological situation worsens. Deficit of the state budget is possible. The need in import of many industrial and food products increases.</p>	<p>When mining-and-geological and natural conditions of production worsen, production expenses increase. There is a decrease in active reserves of mineral raw resources. Due to financial and institutional difficulties related to reclaiming new deposits, there can be delays in reliable supplies of raw materials to consumers.</p>
<b>Evolutionary scenario</b>			
<p>The priority is not only the budgetary and commercial efficiency but also public one (the need to meet interests of all stakeholders). Market tools of sustainable development (privileged loaning, leasing tools, state and private partnership, joint enterprises, and international consortiums) are actively developed.</p>	<p>Active participation of foreign and national investors in new projects of exploring mineral raw materials. The innovation infrastructure is formed. It contributes to developing and implementing new technologies in the mining industry. New types of products are made due to comprehensive extraction of valuable elements. The range of products and markets to sell them are expanded. Policy of energy efficient development of the sector is pursued. Technologies of intellectual deposits with the countrywide automation of the natural</p>	<p>The national economy becomes more sustainable due to the establishment of productions aiming at producing items of a higher level and processing productions. The ecology is improved as a result of improving the efficient of using power and rational use of mineral resources. The budgetary efficiency is gradually improved, tax revenues from using extractive objects grow.</p>	<p>The volumes of promising surveys grow. The need in mineral resources increases. The reproduction ensures the growth of proved reserves of mineral resources over mining approximately on the level of 10-15%. Volumes of mining are stabilized, and it is possible to observe its growth on the level of 3-4% per year.</p>

	resources management system are implemented.		
<b>Innovational scenario</b>			
Like those described in the evolutionary scenario. Much attention is paid to the public efficiency and corporate social responsibility of mining companies. Projects to explore deposits are implemented by all stakeholders. The system of privileged lending for natural resources users who pursue the innovation policy is developed. State and private partnerships, joint enterprises and international consortiums are applied.	Active state policy is pursued, and a flexible system of natural resources use aimed at the defining the innovation policy of the sector is created. Large-scale investments in exploring resources with the obligatory development of highly technological productions are made. Marketing logistics and transportation infrastructure are developed intensively. Deposits are exploited by using intellectual system of management. Raw materials are processes in mining regions. The structure of export is changed – from raw materials to products of a higher limit level. The power consuming industry of mining productions moves to the greenhouse gas emissions that approach zero (Cherepovitsyn 2016, Tsvetkov 2016). There is active industrial exploitation of technogenic raw materials. The mechanism of public-private partnership (PPP) is developed (Kalgina 2017)	Regions are developed, the domestic market is filled with products, the export potential of the national economy increases. There is the diversification of the regional budget's profit base. The sectoral structure of the industry changes towards an increase in processing sectors and innovation productions. It is possible to observe the growth of the budgetary efficiency of the mining sector, which happens later because of increasing risky innovation productions. The state obtains a so-called strategic delayed effect. Threats related to sustainable demand for new types of natural resources and products obtained by processing them are possible.	The state actively stimulates users of the natural resources to exploit non-traditional types of mineral resources, technogenic sources of raw materials. Financing of geological surveys by the state and users of natural resources increases. The growth of mineral resources reserves compensates for the production and is 15-20%. Mining is stabilized in the medium-long perspective. There will be its annual growth up to 4-6% per annum.

## 5. Discussion

Thus, scenarios are a certain idea about prospects of developing of the economic and social system they are developed for. Most often scenarios are a qualitative projection where some extremely important qualitative estimates are allowed and required. Thus, the scenario planning differs from forecasting that emphasizes the variety of stipulated qualitative indicators. Scenario planning is an urgent tool of strategic planning and management in various sectors of the economy, at enterprises and their strategic business units, as well as when estimating macro-economic factors of the environment and markets of raw materials. The method of scenarios is useful when defining goals of the organization, its development strategy, as well as during the long-term forecasting when current achievements do not matter, and it is more important to apply new opportunities. At the same time, when forming

strategies in the mineral resources sector, they single out various types of scenarios: global, country, regional, and corporate.

The global scenario deals with the development of the global mineral resources sector and its sub-sectors. It analyzes prospects of the economic growth of countries and regions, volumes of mining and demand for various types of mineral resources. It forecasts the change of prices and development of technologies, i.e. main factors that have an impact on the global demand and supply on markets of raw materials in the longer term.

Country scenarios are used both by state governmental bodies that form the strategy of the complex development within a certain country, and certain companies that work on the territory of a country (Russia, Kazakhstan, Azerbaijan, Uzbekistan, etc.).

The regional scenario is related to the development of certain regions, for example, Eastern, Northern, Southern, Kazakhstan, Eastern Siberia, etc., that have the high concentration of the mineral resources potential. If the scenario is planned by a company, it focuses its attention on the region where it works.

Specialized corporate scenarios focus their attention both on every sector of the vertically integrated company (exploration, exploitation, concentrating and processing, and logistics), and when calculating indicators of the economic efficiency of the company while implementing a certain scenario.

## **6. Conclusion**

Thus, under the modern rapidly changing conditions where the mineral resources sector in general and mining companies function, with the high volatility of markets of raw materials and energy products, as well as sudden changes of macro-economic, political, technological and social factors of the macro-environment, it is reasonable to use tools of scenario planning. In order to efficiently manage various structures, it is necessary to have a set of the most probable scenarios of events development and to be ready to react on the changes that are taking place.

Scenario planning in the mineral resources sector is designing, creating various trends to develop the mineral resources potential, mineral resources markets, and technological factors that define the activity of companies of the mineral resources sector that must be well-structured and logical. Under such approach the strategy acquires the required flexibility and adaptability to changes, and the company gets additional possibilities to maintain, strengthen and develop its competitive advantages in the context of various variants of the events development.

In this work basic scenarios of developing the mineral resources sector as an approbation of theoretical researches are offered. These scenarios

are characterized in terms of general macro- and micro-economic prerequisites of applying them, basic economic factors that characterize them, peculiarities of the state regulation under this development scenario, basic parameters of the social and economic development and state of the mineral resources base.

These scenarios are a consequence of the general vector of the global and national economy development. Within these scenarios it is necessary to work out scenarios of developing certain sectors and areas of the mineral resources sector, as well as certain mining companies. Such basic scenarios are a good benchmark to develop scenarios for minors (sector, a certain complex, company, company subdivision, etc.).

### **Acknowledgements:**

The paper is based on the research carried out with the financial support of the grant of the Russian Science Foundation (Project No. 14-38-000090) “*The program-targeted management of the Russian Arctic zone development*” at Peter the Great St. Petersburg Polytechnic University.

### **References:**

- Aaker, D.A. 2002. Strategic market management. Saint Petersburg, Peter, 182-189.
- Bashmakov, A.I., Popov, V.V., Zhedyaevskii, N.D., Chikichev, N.D. and Voyakin, A.E. 2015. Generic Heurorithm of Innovation Management from Generating Ideas to Commercialization. European Research Studies Journal, 18(4), 47 -56.
- Berezina, A.A. and Cherepovitsyn, A.E. 2014. Economic concept of oil and gas “intellectual deposit”. Oil Economy, 4, 14-15.
- Bourgeois, L.J. 1998. Strategic management from concept to implementation. University of Virginia, Darden Graduate School of business.
- Bretsman, F. 2011. Scenario planning is back and becomes an integral part of efficient corporate management, <http://performance.ey.com/wp-content/uploads/downloads/2011/08/Scenario-Planning4.pdf>.
- Cherepovitsyn, A. and Ilinova, A. 2016. Ecological, economic and social issues of implementing carbon dioxide sequestration technologies in the oil and gas industry in Russia. Journal of Ecological Engineering, 17(2), 19-23.
- Dmitrieva, D. and Ilinova, A. 2016. Application of strategic analysis methods and tools in Russian mining and chemical complex. International Journal of Applied Engineering Research, 11(8), 5567-5572
- Eddous, M. and Steisfild, R. 1997. Methods of taking decisions, Moscow, UNITI.
- Fahey, L. and Randall, R. 1998. Learning from the Future. John Wiley & Sons Limited.
- Frolova, E.V., Rogach, O.V., Kabanova, E.E., Medvedeva, N.V. and Shimanskaya, IY. 2017. Tendencies and Prospects of Tourism Industry in Russia: Sociological Analysis of Stereotypes among Population during Tourism Trips. European Research Studies Journal, (20)2B, 308-320.
- Godet, M. 2001. Creating Futures: Scenario Planning as a Strategic Management Tool. London, Economica.
- Gordon, T.J. and Hayward, H. 1968. Initial experiments with the cross-impact matrix method of forecasting. Futures, 1(2), 100-116.

- Helmer, O. 1977. Problems in futures research: Delphi and causal cross-impact analysis. *Futures*, 17-31.
- Ilinova, A.A., Cherepovitsyn, A.E. and Larichkin, F.D. 2014. Sectoral peculiarities of forming competitive strategies in the mining and chemical comple. *EKO All-Russian Economic Bulletin*, 1(475), 121-135.
- Kahn, H. and Wiener, A. 1967. *The Year 2000: A Framework for Speculation on the Next Thirty-Three Years*. The Hudson Institute.
- Kalgina, I.S. 2017. Models for assessment of public-private partnership projects in subsurface management. *Journal of mining institute*, 224, 247-254.
- Kees van der Heijen, 1996. *Scenarios: The Art of Strategic Conversation*. John Wiley & Sons Limited.
- Kees van der Heijen, 1997. *Scenarios, Strategies and the Strategy Process*. Nijenrode University Press.
- Laeva, T.V. 2006. Scenario analysis as basis of strategic planning in the organization. *Management in Russia and abroad*, 2, 56-63.
- Lindgren, M. 2009. Scenario planning. Relation between the future and strategy. Moscow, "Olimp" CJSC.
- Ogilvy, J.A. 2002. *Creating Better Futures: Scenario Planning as a Tool for a Better Tomorrow*. Oxford University Press.
- Ogilvy, J. and Schwartz, P. 2004. *Plotting Your Scenarios*. Global Business Network.
- Pociovalisteanu, M.D., Thalassinou, I.E., Tirca, A. and Filho, L.W. 2010. Trends and challenges in the energy sector of Romania in the post-accession to the European Union. *International Journal of Environmental Technology and Management*, 12(1), 3-15, DOI: 10.1504/IJETM.2010.029957.
- Porter, M.E. 1998. *Competitive Advantage: Creating and Sustaining Superior Performance*. New York, The Free Press, (2nd ed.), 592.
- Ringland, G. 2008. Scenario planning for developing business strategy. Moscow, *Dialectics*, 559.
- Schoemaker, P.J.H. 1980. *Experiments on Decisions under Risk: The expected Utility Hypothesis*. Boston, Nijhoff Publishing Co.
- Schwartz, P. 1991. *The Art of the Long View*. New York, Doubleday, Currency.
- Titova, N. Yu., Pervuhin, M.A. and Baturin, G.G. 2017. Identification of Regional Clusters in the Russian Far East. *European Research Studies Journal*, 20(4), 339-359.
- Tsvetkov, P. and Cherepovitsyn, A. 2016. Prospects of CCS projects implementation in Russia: environmental protection and economic opportunities. *Journal of Ecological Engineering*, 17(2), 24-32.
- Zedgenizova, I. and Ignatyeva, I. 2017. The Problems of Creation and the Prospects for Development of Regional Clusters. *European Research Studies Journal*, 20 (4A), 578-595.