

Mechanism of business entities innovative development management (organizational and economic approaches)

Y. Zhilkina^{1,*}, D. Vodennikov¹

¹ Federal Grid Company of Unified Energy System, Moscow, Russia

Abstract. The development of the national economy and the increase of domestic enterprises competitiveness are associated with the transition to an innovative model of economic development. We proposed the structure of organizational and economic mechanism, which distinctive characteristic is the composition of the interaction process of subjects and objects of management. As subjects of management in mechanism we singled out three subsystems: functional, process and administrative which are the bases of innovative development. As a result of the research it is found that the process of innovative development management should be considered as a set of subprocesses series, reflecting the combination of the main stages of the innovation life cycle. We proposed scientific and methodical approach to evaluate the effectiveness of entities innovative development management, which allows us to assess their level of innovation and generate proposals for adjusting innovation strategy.

1 Introduction

The economic development of the country depends on the intensity and quality of domestic enterprises modernization, because the degree of satisfying society's needs determined by the level of their development, due to rising demand for products and services. It should be noted that in the present conditions of formation of an innovative economic model and an effective development of domestic enterprises are provided through the continuous introduction of innovative transformation of their elements [1, p. 23]. The development of the national economy and the increase of domestic enterprises competitiveness are associated with the transition to an innovative model of economic development, which includes a high concentration of knowledge and technology [2, p. 50]. Currently, there are several problems to ensure the innovative development of domestic enterprises. One of these problems is the lack of effective mechanisms of innovative development management which is based on the relationship and heterarhichnost of all elements of management and ensuring the effectiveness of their interactions both within the enterprise and in the relationship with the external business environment. Innovations implementation provides not only economic growth of business entities, but also strengthens both financial stability and safety of the country. In these circumstances, the problem of organizational and economic mechanism formation of effective entities innovative development management acquires significant relevance.

The business sector is an essential element in the commercialization of innovative development and primary identifier that characterizes the scientific, technological and economic development of any country. The implementation of modernization course is impossible without the formation of high-tech sector in the innovative ideas implementation in all regions of the country [3, p. 60]. Thus, you should clearly understand the nature, role and interaction of each element of mechanism in management for the successful development of innovative enterprise. Forming the organizational and economic mechanism it is appropriate to comply the system approach because of the possibility of its formalization as a set of interrelated elements that take into account the principles of transformation of input and output parameters, methods, techniques and tools, as well as organizational and economic impact of the subject to the object. Management is an integral part of any activity that requires coordination in different degree [4, p. 49].

2 Structure of organizational and economic mechanism of business entities innovative development management

A distinctive feature of the proposed mechanism is the composition of interaction process of subjects and objects of management. There are three subsystems as management subject in mechanism such as functional, process and management that are the basis of the process of innovative business entities development. The object

* Corresponding author: zhilkina.yulia@gmail.com

Table 1. The composition of subprocesses of organizational and economic mechanism of business entities innovative development management and its efficiency indicators^a.

Subprocess name of innovative development management	Subprocess tasks of innovative development management	The expected effect	The index of efficiency
The innovation demand management (SS1)	Defining the internal needs in innovations and development of the request for innovations on the basis of strategic goals of enterprise development.	Scientific and Technical	IS; NT
Innovation acquisition management (SS2)	Organization of cooperation with domestic and foreign research and development organizations. Innovation market research.	Resource and Social	MR; P
Innovation ideas management (SS3)	Information gathering to solve the problem (search and generation of ideas). Selecting the most perspective ideas. Ideas modification to the stage of applied research.	Scientific and Technical; Economic; Social	IS; NT; NP; P
Applied research management (SS4)	Defining the objectives of the study. Research planning and organization. Conducting the research. Analysis of the results.		
Research work management (SS5)	Formation of innovative ideas. Analysis of business opportunities. Evaluating the effectiveness and risks of innovative projects. Project implementation. Economic indicators monitoring. Testing.		
Innovation implementation management (SS6)	The choice of organization work form. Organization and control the terms and spending. Placing the product / service in the market.	Economic; Financial	NP; IP
Innovation potential management (SS7)	1. Information gathering about the state of innovation potential components. 2. Defining methods and indicators to assess the innovative development capacity; 3. Estimation and analysis of innovative potential. 4. Identifying problems and opportunities for the development of innovative potential. 5. Business opportunities research. 6. Development the measures for innovative potential development. 7. Evaluating the effectiveness of developed measures implementation.	Resource Economic; Financial	MR; NP; IP
Designation: IS – provision of intellectual property; MR – material resources; NT –new technology development; NP –new products development; P – staff engaged in research work; IP – amount of investment in innovation projects.			
^a Source: Compiled by the authors based on [6,7,8]			

of the management is sub processes. Thus, the process of innovative development characterizes the work of process subsystem, process innovative development management forms the innovative development work of management subsystem and collectively these processes determine the work of functional subsystem. The structure of mechanism functions includes analysis, normalization, accounting, forecasting, organization, control, regulation and coordination. These management functions comprehensively and purposefully intend to apply to the entire spectrum of administrative actions, regardless of property management and share in the activities of managers at different levels. The implementation of mechanism functions is carried out by means of management. As leverage innovative development was defined the system of innovative indicators capacity of enterprises, in particular, expenditure, personnel, length of development and innovation and so on.

The problems of efficiency increasing of domestic enterprises innovative development more often occur as a result of numerous external factors. Therefore, forming the mechanism of companies' innovative development management it is necessary to define which economic, political, technological, social and other factors have an impact on the enterprise as part of an innovative

component of enterprise functioning [5, p. 116]. The relationship of organizational and economic mechanism elements is key, because it connects all of its components and formalizes the process of mechanism functioning - from setting goals, through the relationship between subject and object management, providing the mechanism, the process characteristics of innovative development, the tools to get the results and compare them with the purpose in the output.

The offered structure of organizational and economic mechanism of entities innovative development management allows us to achieve the goal of innovative development of individual elements within the overall development strategy, to ensure the actual implementation of developed innovations and coordinate the work of all elements of the mechanism in order to enhance the innovative activity of business entities. One of the most important elements of organizational and economic mechanism of entities innovative development management is subprocesses of management. In other words, the process of innovative development management is considered as a set of subprocesses series. So, it should be defined what problems will be resolved within the framework of each subprocess of innovative development management (Table 1).

Table 2. Enterprise grouping according to the level of innovative development^b.

Group	
The value of integral index of enterprise innovative development	
IR < 0.1 – low	
0.1 ≤ IR < 0.5 – average.	
IR ≥ 0.5 – high	
Characteristics	1. A moderate part of staff involved in the research work. 2. The average level of new technologies and equipment implementation 3. The low proportion of new products developing and required resources for their manufacture in the total volume 4. The low level of intellectual property provision 5. Very low level of projects funding
	1. A moderate part of staff involved in the research work. 2. The high level of new technologies and equipment implementation 3. The low proportion of new products developing and required resources for their manufacture in the total volume 4. The average level of intellectual property provision 5. Moderate amounts of projects funding
Proposals	Searching for ways of innovative activities development: - sustainable use of resources; - increase the efficiency of HR potential usage; - improving the quality of research work; - improvement of assimilated products and technologies; - new products and processes development.
	Capacity building up through: - sustainable use of resources; - increase the efficiency of HR potential usage; - development of production capacities and innovative projects implementation; - new products and processes creation and usage; - increasing the intellectual property objects.
	Position maintenance through: - staff motivation and encouraging its effective work; - increasing the information potential; - improvement of assimilated products and technologies; - encouraging new products and processes development; - competitive advantages.

^b Source: Compiled by the authors based on [9-13]

Thus, subprocesses of innovative development management reflect the combination of the main stages of innovation life cycle each of which occupies a certain place and the value in it, all of them are interrelated and complementary. The basis of our research is the enterprises of information and telecommunications field. On the basis of the received information we calculated the indexes of efficiency of innovative development management. Considering that the studied parameters have different dimension it is necessary to bring them to a dimensionless form - a single interval of measurement based on valuation.

The standardization was carried out by rate maximizing. The normalized index we define as the ratio of the calculated absolute average value of the i-index to the best absolute average value of this index in the analyzed group of enterprises:

$$Q_m = \frac{\bar{Q}_i}{Q_{IB}} \quad (1)$$

where: Q_m - the normalized i-index; \bar{Q}_i - the average value of the i-index for the analyzed period; Q_{IB} - the best average value of the i-index in the analyzed group of enterprises for the analyzed period.

We determined the weight coefficients of indicators by the method of peer review, as a result of the industry innovative features research. The calculation of the integral index of enterprise innovative development was carried out using average normalized values of indexes for the analyzed period and weighting coefficients by the formula:

$$IR = \sum_n^{i=1} V_i * Q_m \quad (2)$$

where: IR - the integral index of enterprise innovative development;
 V_i - the weight of i index.

Enterprises activities are analyzed in terms of efficiency of their innovative development with the introduction of a developed organizational and economic mechanism during the 2014-2018 that helps to determine the reference values for the integral index of innovative development. Thus, if the integral index $IR \geq 0.1$ - the enterprise has average and high level of innovative development: $0.1 \leq IR < 0.5$ - the enterprise has an average level of innovative development, $IR \geq 0.5$ - high. If $IR < 0.1$ - the enterprise has low level of innovative development.

Table 3. The results of efficiency evaluation of innovative development management of the studied enterprises of telecommunication and information areas^c.

		IS	MR	NT	NP	P	IP
LLC "Telsvit"	2014	0.204	0.325	0.154	0.164	0.315	0.742
	2015	0.402	0.125	0.311	0.197	0.374	0.731
	2016	0.314	0.247	0.315	0.194	0.317	0.745
	2017	0.417	0.248	0.157	0.190	0.314	0.764
	2018	0.149	0.648	0.541	0.185	0.310	0.721
	Q_m	0.690	0.727	0.348	0.393	0.529	0.877
		$IR = 0.271$					
LLC "Mehalink"	2014	0.240	0.358	0.214	0.147	0.314	0.721
	2015	0.412	0.147	0.374	0.214	0.374	0.614
	2016	0.574	0.258	0.168	0.297	0.415	0.640
	2017	0.614	0.159	0.614	0.284	0.484	0.682
	2018	0.295	0.346	0.184	0.215	0.491	0.712
	Q_m	0.990	0.579	0.366	0.489	0.674	0.798
		$IR = 0.241$					
LLC "ISP Riad"	2014	0.124	0.241	0.614	0.125	0.210	0.694
	2015	0.341	0.315	0.841	0.127	0.231	0.674
	2016	0.129	0.184	0.912	0.137	0.240	0.624
	2017	0.187	0.257	0.941	0.157	0.201	0.620
	2018	0.412	0.345	0.942	0.174	0.212	0.651
	Q_m	0.554	0.613	1	0.304	0.355	0.773
		$IR = 0.329$					
LLC "Promtel"	2014	0.247	0.321	0.413	0.410	0.610	0.852
	2015	0.348	0.244	0.419	0.419	0.621	0.841
	2016	0.412	0.315	0.512	0.512	0.627	0.853
	2017	0.374	0.274	0.571	0.510	0.613	0.810
	2018	0.185	0.619	0.482	0.515	0.614	0.864
	Q_m	0.727	0.810	0.564	1	1	1
		$IR = 0.304$					
LLC "Laynkord"	2014	0.274	0.316	0.122	0.184	0.149	0.827
	2015	0.612	0.318	0.147	0.415	0.164	0.831
	2016	0.278	0.491	0.157	0.454	0.191	0.614
	2017	0.412	0.319	0.164	0.415	0.175	0.652
	2018	0.579	0.746	0.147	0.491	0.164	0.640
	Q_m	1	1	0.173	0.828	0.273	0.845
		$IR = 0.692$					
LLC "Kvazar Mikro Radio"	2014	0.147	0.194	0.194	0.156	0.271	0.651
	2015	0.284	0.379	0.614	0.164	0.293	0.472
	2016	0.348	0.167	0.667	0.174	0.288	0.431
	2017	0.147	0.319	0.648	0.192	0.246	0.512
	2018	0.215	0.274	0.621	0.181	0.253	0.572
	Q_m	0.529	0.609	0.647	0.366	0.438	0.625
		$IR = 0.519$					

^c Source: Calculated by the authors

3 Level of innovative development

Depending on the level of innovative development we formulate the characteristics of the current state of the enterprise and recommend creating innovative behavior of corrective or supportive nature. We can group companies according to the level of innovative development and provide the characteristic of the current state and form proposals for improving the innovative strategy based on the assessment (Table 2).

The results of efficiency evaluation of innovative development management of the studied enterprises of

telecommunication and information areas are presented in Table 3.

Thus, as a result of efficiency evaluation of innovative development management of the enterprises such as LLC "Telsvit", LLC "Mehalink", LLC "ISP Riad", LLC "Promtel" are referred to the group with average level of development. These enterprises should strengthen the innovative potential through the development of production capacity, improvement of management practices, and sustainable use of resources.

The enterprises LLC "Laynkord" and LLC "Kvazar Mikro Radio" achieve a high level of innovative development within the implementation of a developed organizational and economic mechanism. Thus, based on

the results of efficiency evaluation of innovative development management, these enterprises need to improve assimilated products and technologies to maintain a competitive advantage.[14]

4 Conclusions

Thus, organizational and economic mechanism of entities innovative development management is a system of tools, methods, functions and principles of management process which are used in the practice of business entities. The developed organizational and economic mechanism of innovative development management, allows taking into account functional relationship among all elements of control, ensures efficient use of available resources, optimizes work and minimizes the risks associated with its implementation for the growth of business entities innovative activity. As a result of the research it is determined that the process of innovative development management should be viewed as a set of subprocesses series that reflect the combination of the main stages of innovation life cycle. Depending on the goals and objectives of each subprocess, we determined performance indicators of innovative development management within the proper effect [15, p. 593]. The developed scientific and methodical approach to evaluate the efficiency of entities innovative development management allows us to consider the impact of scientific and technological, resource, economic, financial and social types of effects, assess the level of innovative development and create proposals for adjustments of business entities innovative strategies.

References

- [1] S. Terjesen, In Search of Process Innovations: The Role of Search Depth, Search Breadth, and the Industry Environment / S. Terjesen, P. Patel // *Journal of Management* **43(5)**, 1421–1446 (2017)
- [2] Y. Qiu, G. Colson, C. Grebitus, Risk preferences and purchase of energy-efficient technologies in the residential sector // *Ecological Economics*. **107**, 14 (2014)
- [3] A.V. Vasenkov, A.A. Prokhozhev, *Security of Russia: modern understanding of security*. – M.: Rosecolored "Creation", 22 (1998)
- [4] Yu.V. Zhilkina, *Economic mechanism of innovative management of energy security* // III Manyakin readings. Materials of the international scientific-practical conference. Publishing house: Russian state University of trade and Economics, Omsk Institute (branch) (2014)
- [5] U.Ya. Andrusiv, I.M. Mazur, I.P. Kinash, Systematic approach to the formation of management mechanism of construction enterprises innovation activity // *Economic Processes Management: International Scientific E-Journal*. **4**, Available: http://epm.fem.sumdu.edu.ua/download/2016_4/epm2016_4_2.pdf (2016)

[6] M. Cardona, T. Kretschmer, T. Strobel, ICT and productivity: Conclusions from the empirical literature Institute for Strategy, Technology and Organization: Elsevier B.V., **25**, 109-125 (2013)

[7] M. Kerste, M. Gerritsen, J. Weda, B. Tieben, Systemic Risk in the Energy Sector – Is There Need for Financial Regulation? // *Energy Policy* **78**, (2015) (<https://doi.org/10.1016/j.jebo.2017.09.013>)

[8] P. Burgherr, J. Giroux, and M. Spada, Accidents in the Energy Sector and Energy Infrastructure Attacks in the Context of Energy Security // *European Journal of Risk Regulation*. **6(2)**, 271-283 (DOI: <https://doi.org/10.1017/S1867299X00004578>) (2015)

[9] Y. Qiu, G. Colson, C. Grebitus, Risk preferences and purchase of energy-efficient technologies in the residential sector // *Ecological Economics*. **107**, 14 (2014)

[10] T. Grynko, T. Gviniashvili, *Organisational and economic mechanism of business entities' innovative development management* // *Economic Annals-XXI*, (2017)

[11] I.A. Kvasov, *Mechanism for system management of innovative development* // (DOI: 10.18323/2073-5073-2015-4-116-120) (2015)

[12] M. Kerste, M. Gerritsen, J. Weda, B. Tieben Systemic Risk in the Energy Sector – Is There Need for Financial Regulation? // *Energy Policy* **78**, (<https://doi.org/10.1016/j.jebo.2017.09.013>) (2015)

[13] I.A. Kapitonov, G.A. Taspnova, V.R. Meshkov, A.A. Shulus, Integration of small and middle-sized enterprises into large energy corporations as a factor of business sustainability *International Journal of Energy Economics and Policy* **7(2)**, 44-52 (2017)

[14] E.G. Popkova, V.I. Tinyakova. New Quality of Economic Growth at the Present Stage of Development of the World Economy. *World Applied Sciences Journal*, **5**, 617-622 ((2013))

[15] E.G. Popkova, S.S. Morkovina, E.V. Patsyuk, E.A. Panyavina, E.V. Popov, Marketing Strategy of Overcoming of Lag in Development of Economic Systems. *World Applied Sciences Journal*, **5**, 591-595 (2013)