ACADEMY OF ECONOMIC STUDIES OF MOLDOVA

As a manuscript

C.Z.U.: 005.21:621.316.1(043)

CORBU, Viorel

INNOVATIVE STRATEGIES IN THE OPERATIONAL MANAGEMENT OF ELECTRICAL NETWORKS

521.03 ECONOMICS AND MANAGEMENT IN FIELD OF ACTIVITY

Abstract of the Doctoral Thesis in Economic Sciences

Chisinau, 2024

The thesis was elaborated within the Department of "Management and Entrepreneurship", Academy of Economic Studies of Moldova

Scientific advisor:
Alina SUSLENCO, Doctor Habilitate in Economic Sciences, Associate Professor

Public Defence Committee:

1. **COTELNIC Ala**, Doctor Habilitate in Economy, University Professor – ***President***
2. **SUSLENCO Alina,** Doctor Habilitate in Economic Sciences, Associate Professor – ***PhD supervisor,***
3. **DOROGAIA Irina,** PhD in Economics, Associate Professor – ***Official Referent,***
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5. **CATAN Petru**, Doctor Habilitate in Economy, University Professor – ***Official Referent,***
6. **HLUSOV Viorica**, PhD in Technology, Associate Professor – ***Official Referent,***

The defence will take place on 13.09.2024, at 12.00 a.m., in the meeting of the Doctoral Thesis Public Defence Committee of the Academy of Economic Studies, address: Chisinau, Mitropolit G. Banulescu Bodoni str., No. 61, MD-2005, building B, 104 Hall of ASEM.

The doctoral thesis and the abstract can be consulted at the Scientific Library of the Academy of Economic Studies of Moldova and on the ANACEC (www.cnaa.md). The abstract was sent on ___.08.2024.

President of Public Defence Committee, **COTELNIC Ala**
Doctor Habilitate, University Professor

Scientific doctoral advisor, **SUSLENCO Alina**
Doctor Habilitate, Associate Professor

Autor, **CORBU Viorel**

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CONCEPTUAL FRAMEWORK OF THE RESEARCH

Actuality and importance of the problem addressed. In a market economy, one of the decisive factors in achieving the efficiency and performance of an organization is the effective management of its resources. However, companies are often faced with increasing expenses regarding insurance, resource management, and currently, in the context of achieving sustainability, companies are forced to resize their management systems in order to optimize the utilization of resources. For this purpose, innovative strategies intervene as a determining factor in the modeling of the managerial system in the context of the changes that have taken place.

On the other hand, modern and effective management requires the application of viable strategies, adapted to the context, which could help companies to cope with changes. We believe that the adaptation of the management system to environmental changes, flexibility, innovation, will help companies to face the multiple challenges appearing on the market.

One of the strategic sectors of the national economy, of vital importance for the country's economy, is the electricity sector. In the context of the energy crisis, this sector underwent profound transformations and the management system of the sector's companies were obliged to continuously adapt to the new context.

A fundamental role in ensuring the performances achieved by the companies in the electricity sector is played by the operative management of the electricity networks, on the functionality of which depends, to a large extent, the continuity of the provision of electricity to consumers. The operational management service is responsible for providing consumers with electricity as well as eliminating losses, regulating the voltage in the network, smoothing out exceptional situations, etc. The quality indicators of the companies in the electricity sector depend, to a large extent, on the continuity of electricity supply, as well as on the reduction of losses in the network. Moreover, the innovations applied in the electricity sector can help companies to achieve the assumed strategic objectives: achieving energy efficiency and security, but also sustainability, which has become a real challenge for companies in this sector.

Accordingly, there is a need to research the innovative strategies applied by companies in the electricity sector in the operative management of electric networks, as well as the factors, principles, characteristics of their implementation process, to increase organizational performance.

In the same context, the importance of the subject addressed in this paper is punctuated by the energy crisis faced, starting with 2020, by the European Union, on the one hand, but also by the Republic of Moldova, on the other. We believe that the application of innovative strategies, both in the management system, as a whole, and in the operative management of electrical networks, will help companies in this sector to register an increased level of efficiency, to record new performances and to adapt much more easily to the approach of achieving sustainability.

The motivation for choosing the subject. The importance of the research topic is determined, first of all, by the need to form new approaches in the operative management of energy companies, where the main advantage is rendered by the effective training of human capital from the companies' dispatches in this field.

Secondly, energy is the fundamental industry, a strategic branch of the national economy, and the well-being of the state as a whole depends, to a large extent, on how effective and consolidated the strategies applied by companies in this sector will be.

As a result, as electricity is a strategic resource, a vital one for the development of the national economy, we considered it necessary to research and identify opportunities to improve the strategies applied in the operational management of electricity networks, by the companies in this sector, in order to increase the performances recorded.

The topicality of the research topic stems from the need to research the possibilities of achieving energy security and efficiency in electricity companies through the lens of perfecting the innovative strategies applied in the operative management of electrical networks as a determining factor of the organizational performance of enterprises in this sector. At the same time, we believe that the development of the human factor, which is the vital resource that ensures the operative management of electrical networks, can help companies to increase their performance and increase the quality indicators of the services offered.

This work represents a theoretical-practical substantiation of the defining aspects of the innovative strategies applied by energy companies in the process of operational management of electrical networks in the context of achieving energy efficiency and security.

The need to research these elements is a fundamental one, because with the improvement of the strategies applied in the operational management of electric networks, the companies in this sector will have the opportunity to improve their approach to increasing productivity, economic performance, as well as to align with the approach of achieving sustainability. In addition to this, companies will have the opportunity to re-size their entire management system by infiltrating new management methods and techniques that would help companies to record an increased level of performance. In the same context, the reshaping of strategies from the operational management of electrical networks will help companies in the electricity sector to optimize their costs, readjust their approach to achieving performance, become more independent, flexible and adaptable to the external environment.

From these considerations, we highlight the need to solve the ***research problem*** which consists in the *theoretical and methodological substantiation of the improvement of innovative strategies applied in the operative management of electrical networks in order to ensure energy efficiency and security*. In this context, we highlight the significant contribution of the innovative

strategies applied by the companies in the electricity sector on the energy independence of the country, on the one hand, but also on the efficiency and performances recorded by this sector.

The degree of study of the researched topic in the Republic of Moldova is limited. The subject of innovative strategies has been addressed by numerous researchers from abroad such as: I. Ansoff, A. Chandler, P. Drucker, S. Floyd, C. Freeman, L. Hrebeniak, D. Hunger, R. Kaplan, P. Kotler, A. Lam, H. Mintzberg, L. Njagi, C. Noble, F. Okumus, A. Thomphson, M. Zack, who elucidated the main managerial strategies and the effects of their implementation within companies.

At the same time, it is worth pointing out the significant contribution made in this field by researchers from Romania, such as D.-T. Agheorghiesei (Corodeanu), I. Popa, C. Dobrin, D. Zaiț, I. Pohoață, C. Popescu, A. Prodan, O.Nicolescu, B. Bacanu, C. Brătianu, O. Gica, M. Popa, P .Vagu, etc., who contributed to the realization of empirical studies on the essence and efficiency of organizational management strategies.

Research carried out in the Republic of Moldova by researchers such as: C. Gribincea, I. Munteanu, A. Tomsa, O. Calmic, A. Cotelnic, A. Suslenco, L. Covas, N. Platon, A. Litvin, L. Bugaian, A. Popa, I. Dorogaia, G. Belostecinic, A. Solcan, R. Perciun, C. Tcaci, L. Babii, etc., elucidated various aspects of the need to resize the management system of national enterprises, on the one hand, but also of those in the electricity sector, on the other hand, in the context of increasing economic performance and energy efficiency, through the prism of the integration of innovations in the management system of companies.

The purpose and objectives of the research. The aim of the research *is the development of theoretical-methodological approaches to the improvement of the managerial system of the enterprises of the electricity sector in the Republic of Moldova, by identifying the most relevant innovative strategies in the operational management of electrical networks capable of directing the management system of enterprises towards principles based on energy safety, efficiency, sustainability.*

Therefore, it is worth demonstrating the necessity of perfecting the managerial system of enterprises in the electricity sector through the lens of resizing and applying innovative strategies in the operative management of electrical networks.

The application of innovative strategies in the operative management of electrical networks within the companies in this sector is punctuated by the need to face the energy crisis, to resize the managerial system that will give companies the opportunity to optimize and perfect their approach to achieving energy security and organizational efficiency.

In order to achieve the purpose of the research, we established the **research objectives**, as follows:

O1: researching theoretical-methodological approaches regarding strategic management and innovative strategies applied in the business environment;

O2: identifying the characteristics of innovative strategies and policies applied by enterprises in the electricity sector in developed countries;

O3: evaluating the performance indicators of the electricity sector of the EU and the Republic of Moldova;

O5: evaluating the innovative strategies applied in the operational management of electrical networks within J.S.C. "Red-Nord";

O6: elaborating the directions for the efficiency of the operational management of the electrical networks within J.S.C. "Red-Nord" through the prism of the integration of innovative strategies.

Research questions:

In accordance with the research objectives, we developed the *research questions*:

- What are the elements, principles and features of innovative strategies in the electricity sector?
- What is the effectiveness of the implementation of innovative strategies within the enterprises of the electricity sector in the Republic of Moldova?
- What are the most effective strategies for operative management of electrical networks within the enterprises of this sector in the EU and the Republic of Moldova?
- How companies in the electricity sector can align with sustainability goals?
- What innovative strategies for operative management of electrical networks does J.S.C. "Red-Nord" apply?
- How electricity companies can reshape their innovation strategies to increase energy security and organizational efficiency?

Research hypotheses:

Based on the established questions, but also in order to achieve the research objectives, we established the following research hypotheses:

Hypothesis 1: innovative strategies contribute to increasing the organizational performance;

Hypothesis 2: the strategies applied by the companies in the electricity sector require a resizing by integrating the approach to achieving sustainability;

Hypothesis 3: innovative strategies applied in the operative management of electricity networks have a positive influence on sustainability;

Hypothesis 4: the strategies applied by the J.S.C. "Red-Nord" company in the operational management of electricity networks, are innovative strategies focused on the introduction of digitization and orientation towards sustainability;

Hypothesis 5: digitization, innovation and orientation towards sustainability have a positive impact on the efficiency of the management system of the J.S.C. "Red-Nord".

The theoretical support of the study is formed of the specialized literature analysis that provided us with the information regarding the research topic. At the same time, recent scientific articles published on the researched topic in international databases, such as: EBSCO, Emeraldinsight, Researchgate, Web of Science, etc., were analyzed. In addition, various studies carried out by researchers in the given field were analyzed.

Scientific research methodology. The methodology of the scientific research carried out in this work is consolidated on the structural analysis. The research carried out within the work is based on a multilateral, complex analysis of the researched phenomena. The theoretical research carried out in this paper helped us to analyze from a multilateral, complex perspective, the studied concepts, and the empirical studies complemented the results and the theoretical models and gave us the opportunity to evaluate the contribution of the innovative strategies applied by the companies in the electricity sector in the operative management of electrical networks on achieving energy efficiency. The SPSS statistical program was used to interpret the data collected in the quantitative research, which gave us the opportunity to elucidate certain connections between the research variables, through the application of certain statistical tests. SPSS generated tables for us elucidating the average of the responses received from the research respondents.

The informational and statistical support of the work: in order to carry out the research, we used various sources of data, such as: specialized literature in the field of strategic and innovative management, from the last 10-15 years both in the country and abroad. In the same context, the laws, decisions, materials, reports of various national and international organizations were analyzed: the Government of the Republic of Moldova, the Parliament of the Republic of Moldova, the reports of national and international organizations: the Council of Europe, the United Nations, the EU Energy Efficiency Report, ANRE Reports, The National Action Plan in the Field of Energy Efficiency, the Report of the States of the Energy Union, the EU Strategy for the reduction of CO2 gas emissions, the Low Emissions Development Strategy of the Republic of Moldova 2030, the Environmental Strategy of the Republic of Moldova 2014-2023, the Energy Strategy of the Republic of Moldova until 2030, the Development Strategy "Moldova 2030", etc., the statistical data of the National Bureau of Statistics and other institutions, such as Eurostat, the information provided by the European Commission, the information obtained from the activity and financial reports of the J.S.C. "Red-Nord", own research.

Scientific novelty and scientific originality of the work. The results of the research carried out in this work present innovative and original elements:

- the enrichment of the theoretical-methodological framework of the innovative strategies applied within the companies in the electricity sector, in the operative management of the electricity networks;

- identifying the most successful methods, techniques and strategies that will help companies in the electricity sector to remodel their managerial system, in the context of improving the operational management of electricity networks;

- identification of the main innovative strategies applied by energy companies, from EU countries, in the context of achieving sustainability;

- evaluation of the specifics of the innovative strategies of companies in the electricity sector in the Republic of Moldova;

- development of the INTELTEH informational program, applied in order to improve the operational management of electrical networks;

- the research of the specific elements of the innovative strategies applied by S.A. "Red-Nord";

- identifying the possibilities of optimizing the operative management of the electrical networks, within S.A. "Red-Nord", in the context of achieving energy efficiency and sustainability.

The theoretical importance of the work: the research carried out forms a valuable contribution to managerial science on the dimension of the operational management of electrical networks in the context of sustainability, by enriching the theoretical and conceptual framework in this sector. The conceptual approach carried out in this paper allowed us to elucidate the specifics of the innovative strategies applied in the companies in the electricity sector and gave us the opportunity to highlight the ways to improve the strategies applied in the electricity sector of the Republic of Moldova in the context of achieving efficiency energy, security and sustainability.

The applied value of the work lies in the fact that the quantitative research carried out within the J.S.C. “Red-Nord” allowed us to highlight the problems, challenges and also the most relevant solutions in order to increase the performance of the operative management of electrical networks, as well as to evaluate the correlation between the efficiency of the application of innovative strategies in the operative management of electrical networks and the performances recorded by the company.

The documentation and analysis of the quality indicators in the electricity sector registered at the EU level, allowed us to highlight the main challenges faced by the EU in terms of energy safety and efficiency, as well as to elucidate some proposals for the recovery of the created situation. On the other hand, thanks to the documentation and analysis of the dynamics of the main quality indicators in the electricity sector, we had the opportunity to highlight, on the one hand, the problems and challenges faced by the national energy system, and on the other, the OSD of the Republic of Moldova and to point out solutions for the recovery of the created circumstances.

In the same vein, the INTELTEH informational program elaborated in this paper, which has already been tested and implemented within the J.S.C. “Red-Nord” company, allowed to digitize the operational management of the electrical networks within the J.S.C. “Red-Nord”, on the one hand, as well as to streamline the most important indicators of operative management at the company level.

At the same time, the recommendations in this paper can be implemented in the relevant central bodies, as well as within the companies in the electricity sector with the aim of increasing the organizational efficiency and the performances recorded by these companies in the context of achieving security, energy efficiency and sustainability.

The **research results** were implemented within the J.S.C. "Red-Nord" company, as well as within the National Agency for Energy Regulation (ANRE) from the Republic of Moldova.

Approval of scientific results. The results of the research carried out in this work were reflected in 16 published articles, with a total volume of over 9.8 c.a., which include: 2 articles – in foreign magazines; 3 articles – in magazines from the Republic of Moldova; 5 articles – in the proceedings of international conferences abroad, 6 articles – in the proceedings of international conferences (with international participation) in the country.

Also, the scientific results obtained were highly appreciated by the Ministry of Education and Research of the Republic of Moldova, due to the fact that the author of the paper is the winner of the Government Excellence Scholarship, for the year of 2024.

THESIS CONTENTS

In chapter 1 of the work, "Theoretical-methodological Approaches regarding the Contribution of Innovative Managerial Strategies in the Remodeling of the Modern Management System", a complex, multilateral conceptual approach was carried out that allowed the theoretical-methodological substantiation of the work. In this context, the works of scholars from the country but also from abroad were researched on the topic of strategic management, business strategies, as well as energy management, with the identification of the essence and typology of applied strategies, which constituted the theoretical basis of the work.

According to the opinion of specialists M. Zack and J. McQueen, strategic management represents the process of developing and implementing strategies (Zack, McQueen, 2009). Interpreting the definition given by the illustrious specialists, we notice that strategic management focuses on the process of analyzing the business environment and developing successful strategies.

At the same time, analyzing the approach of F.R. David strategic management is the process by which an enterprise defines its long-term evolution and its performance by ensuring the correct formulation of the established strategy (David, 2015). Interpreting the researcher's definition, we note that strategic management helps companies define its long-term evolution in order to achieve organizational performance.

On the other hand, a conceptual retrospective of the notion of strategy was carried out. Making a temporal foray into the evolution of the postulates related to the concept of strategy,

we can outline the fact that the given concept was founded from ancient times, in Greece and Ancient China, before our era, where the strategy was applied in the field of defense, military, and assumed in itself a science that teaches you the art of being a military leader, of achieving victories without entering into conflicts.

With the passage of time, the specialized literature abounds with a multitude of approaches to the definition, role and importance of business strategy and highlights the need to formulate effective and successful strategies to ensure the opportunity for companies to obtain leading positions in the market in order to achieve competitiveness.

We have summarized the most relevant approaches of specialists in the field in table 1. In the same context, the typology and stages of the strategy development process were analyzed, as well as the factors that influence the process of realizing modern strategic planning.

At the same time, the content of innovative strategies was analyzed. The innovative strategy of a company is one of the company's strategies, which involves a set of strategic objectives that fold on innovative activities and is based on target indicators of the effectiveness of innovative activities, as well as ways to achieve the goals and criteria for managerial decision-making.

Table 1. Conceptual approaches in strategy definition

Author	Definition
Michael Porter	Strategy focuses on choosing a distinctive set of activities to deliver a unique combination of value (Porter, 2005).
Henry Mintzberg	Strategy is a pattern or plan that integrates the main objectives, policies and sequences of actions of an organization into a coherent whole (Mintzberg, 2004).
Igor Ansoff	Business strategy is a set of decisions that determine the behavior of the firm in relation to its environment (Ansoff, 2009).
Alfred Chandler	Strategy is determining the fundamental long-term goals and objectives of an enterprise, adopting courses of action and allocating the resources necessary to achieve these goals (Chandler, 1989).
Kenichi Ohmae	Business strategy can be defined as a concentration of a firm's resources on perceived profitable opportunities (Ohmae, 2005).
Peter Drucker	Strategy is the analysis and decision-making process that will enable an organization to achieve its goals (Drucker, 2001).
Richald Rumelt	A good strategy has a coherent logic and is supported by coordinated actions to address critical challenges and create competitive advantages (Rumelt, 2011).
Jay Barney	Competitive strategy is a set of integrated commitments and actions that are intended to deliver value to customers and create a sustainable competitive advantage (Barney, 2018).

Source: Adapted from researchers' approaches

An innovative strategy opens up new opportunities for achieving organizational goals (increasing revenue, improving product quality, increasing market demand, expanding or creating a new market, achieving a leading position in an industry or holding a market position) through the development and implementation of innovations product, technological and organizational and managerial, marketing.

In the same context, *a model of the innovative strategic development* of a company was developed, which includes the implementation of innovative strategies in this regard. Also, the main strategies applied by the authorities of developed countries in the electricity sector were analyzed. Among them we can note green alternatives of home heating systems, energy saving in buildings, energy saving in transport, the use of Artificial Intelligence and digitization.

In chapter 2 of the work, "Evaluation of Managerial Strategies Applied in the Operational Management of Electrical Networks", the analytical part of the paper was substantiated. The chapter begins with the analysis of multiple EU reports to ensure energy efficiency, being reviewed and analyzed multiple relevant quality indicators from this sector that gave us the opportunity to create a general picture of the EU electricity sector, such as and to highlight the evolution trends of the sector, its challenges, but also the opportunities to improve energy management.

At the same time, within the chapter, the structure of the energy system in the Republic of Moldova was analyzed with the identification of challenges, opportunities, problems in its development. For this purpose, the ANRE reports on the development of the electricity sector were analyzed. The dynamics of the main quality indicator in the electricity sector were highlighted and the data interpreted.

The indicators regarding the production and procurement of electricity by the companies in the Republic of Moldova are shown in table 2. The data of the table suggest that the production of electricity in our country is ensured, for the most part, by the J.S.C. "Termoelectrica" company, which in 2023 produced 524.6 million kWh, followed by J.S.C. "Cet-Nord" with 78.9 million kWh, NHE Costesti with 68.8 million kWh and other distributors. At the same time, the procurement of electricity was ensured by J.S.C. "Red-Nord" which procured, at the level of 2023 – 69.1 million kWh, in a significant decrease, by more than 8 times, compared to the year 2001, when the procurements recorded the value of 569.7 million kWh. Most of the electricity procurements were provided by the company C.S.C. "Premier Energy" J.S.C., which since 2018 has procured significant amounts of electricity, registering in 2023 the value of 2891.9 million kWh.

Table 2. Production and procurement of electricity in Moldova, 2001-2023

Indicii	2001	2005	2010	2019	2020	2021	2022	2023
Electricity production (delivered from outgoing power lines) – total, mil. kWh	**1 042,9**	**999,8**	**888,1**	**801,1**	**851,4**	**984,7**	**851,1**	**1 010,8**
incl.: CET-1 (of 2015 – J.S.C. „Termoelectrica")	115,4	128,9	82	×	×	×	×	×
CET-2 (of 2015 – J.S.C. „Termoelectrica")	812,6	724,7	665,4	601,3	621	695,5	528,0	524,6
CET-Nord	31,5	55,5	57,1	58,3	100,5	102,4	83,6	78,9
NHE Costesti	72,2	83,8	78,3	64	46,7	67,5	41,2	68,8
other SRE producers				74,9	81,3	116,6	197,0	337,4
other internal producers	11,2	6,9	5,3	2,5	1,9	2,7	1,4	1,1
Electricity procurement – total, mil. kWh	**3 194,8**	**3 465,1**	**3 915,6**	**4 301,9**	**4 269,8**	**4 591,7**	**4 512,9**	**4 333,1**
incl.: RED Nord	569,7	588,1	651	76,4	74,3	78,1	72,5	69,1

RED Nord-Vest	314,9	287,1	342,4	×	×	×	×	×
Premier Energy Distribution	2 310,2	2 484,3	2 842,2	243,9	226	241,4	228,0	195,1
Premier Energy	×	×	×	2 621,5	2 543,9	2 728,4	2 973,6	2 891,9
FEE Nord	×	×	×	972,7	949	1 046,1	1 067,0	993,2
Moldelectrica	×	×	×	106,5	103,4	116,4	161,9	171,7
Final consumers who used the right of eligible consumer	×	105,6	80	280,9	373,3	381,2	9,9	12,0

Source: ANRE Annual Report, 2023. Available at: https://www.anre.md/raport-de-activitate-3-10

At the same time, a comparative analysis of the main quality indicators registered by the 2 Distribution System Operators (DSO) from the Republic of Moldova was carried out: J.S.C. "Red-Nord" and C.S.C. "Premier Energy Distribution" J.S.C. highlighting the development opportunities and challenges faced by these companies.

A significant evolution was recorded in the delivery of electricity, which, in the period 2001-2023, recorded a positive dynamic in the Republic of Moldova (table 3.). In the last year, there has been an increase of over 7.5% compared to last year, in the total deliveries of electricity recorded in the Republic of Moldova, reaching, at the level of 2023, the value of 3889.0 million kWh. The largest part of the electricity delivered, at the level of 2023, was provided by the company C.S.C. "Premier Energy Distribution" J.S.C., which recorded the value of 2870.8 million kWh and FEE Nord, with 1006.2 million kWh, which are responsible for the delivery of electricity to household consumers.

Table 3. Electricity supplies in the Republic of Moldova, 2001-2023, mil. kWh

Index	2001	2005	2010	2019	2020	2021	2022	2023
Usefully delivered to consumers (electricity consumption) – total, mil. kWh	**2 166,0**	**2 695,1**	**3 311,6**	**3 875,1**	**3 866,2**	**4 155,8**	**4 050,5**	**3 889,0**
incl.: RED Nord	391,0	483,2	564,7	×	×	×	×	×
RED Nord-Vest	181,0	220,3	288,6	×	×	×	×	×
Premier Energy Distribution	1 594,0	1 881,6	2 375,9	×	×	×	×	×
Premier Energy				2 621,5	2 543,9	2 728,4	2 973,6	2 870,8
FEE Nord				972,7	949,0	1 046,1	1 067,0	1 006,2
Final consumers who used the right of eligible consumer	×	101,6	77,4	280,9	373,3	381,2	9,9	12
Other consumers	×	8,4	5,0	×	×	×	×	×

Source: ANRE Annual Report, 2023, https://www.anre.md/raport-de-activitate-3-10

Moreover, the practices applied by developed countries in order to achieve sustainability and energy efficiency were analyzed. At the same time, the international ranking of the World Trilemma Energy Index 2022 (energy sustainability) was researched, with the elucidation of its components, the rating recorded by developed countries, with the highlighting of the position of the states in this ranking. The first three positions in the ranking are held by Sweden, Denmark and Switzerland, which in 2022 demonstrated very good results in all three dimensions of the Trilemma, with well-established energy policies promoting diverse and decarbonisation-oriented energy systems.

According to the World Trilema Energy Index ranking for the year 2022, the Republic of Moldova ranks 61st with the value of the DCCd indicator, registering deficiencies in all 3 dimensions analyzed by the ranking. The Republic of Moldova has a lot of work to do in connecting its policies in the energy sector in order to ensure energy security by diversifying sources of electricity supply, stimulating and capitalizing on alternative sources of electricity, energy equity by increasing the accessibility of energy for every citizen of the country, as well as of energy prices, but also of environmental sustainability which, at the moment, registers low values according to the ranking.

Another direction of the research was carried out to analyze the efficiency of the operative management of the electrical networks within the J.S.C. "Red-Nord" company. The efficiency of the dispatch service within the J.S.C. "Red-Nord" company can be evaluated through the quality indicators of the operative management of electrical networks, registered by the company (table 4.).

Analyzing the table data, we can see that the electricity distribution system operator C.S.C. "Premier Energy Distribution" J.S.C. registered an increasing trend of scheduled unannounced outages, from 0, recorded in 2018, to 109 unannounced outages, recorded in 2022. On the other hand, the J.S.C. "Red-Nord" company, for the entire analyzed period, did not register any unannounced disconnections, in the period 2018-2022. Another direction of the research was carried out to analyze the efficiency of the operative management of the electrical networks within the J.S.C. "Red-Nord" company. The efficiency of the dispatch service within the J.S.C. "Red-Nord" company can be evaluated through the quality indicators of the operative management of electrical networks, registered by the company (table 4.).

A special place in the research of this chapter is the development of the ***Innovative Sustainable Management Model*** developed to increase the energy efficiency and safety of the companies in this sector, on the one hand, but also sustainability, on the other hand.

In addition to this, proposals for improving the operational management of electrical networks within the J.S.C. "Red-Nord" company were highlighted.

Table 4. Quality indicators recorded by DSO, 2018-2023

Index	C.S.C. "Premier Energy Distribution"						J.S.C. "Red-Nord"					
	2018	2019	2020	2021	2022	2023	2018	2019	2020	2021	2022	2023
Total Scheduled Outages	16230	14687	11402	11933	10004	10502	10441	10656	10841	11140	26267	27787
Unannounced Scheduled Outages	0	0	14	58	109	114	0	0	0	0	0	0
Requests for issuance of approval for connection to the electrical distribution network of electrical installations of potential final consumers (10 days)	6727	6741	9243	8016	9116	9113	3921	3161	3497	4052	3655	3832
Requests for the issuance of the approval for connection to the electrical distribution network of power plants (30 days)	121	136	318	514	2490	1136	0	11	149	176	1059	1109

Number of connection requests	11422	12569	12840	15501	11377	14157	2509	2342	1795	2287	2412	2283
The number of final consumers connected within more than 2 days	15	12	4	0	4	1	0	0	0	0	0	0
The amount of compensation, lei	576,13	243	353	0	315,6	314,4	0	0	0	0	0	0
The total number of consumers reconnected	11480	9740	14349	6919	13157	21645	10848	10526	8091	6947	4724	6128
The number of consumers reconnected within more than 2 calendar days	5	3	5	3	1	1	0	0	0	0	0	0
The amount of compensation, lei	78,25	173	207	601,2	69,6	68,6	0	0	0	0	0	0

Source: ANRE Reports, 2018-2023. Available at: https://www.anre.md/raport-de-activitate-3-10

In chapter 3 of the paper, "The Resizing of Managerial Strategies Applied in the Operative Management of Electrical Networks (based on the materials of J.S.C. "Red-Nord")", the practical foundations of the research were laid through the prism of carrying out quantitative research, the empirical study (S1), which had as its method the opinion poll, and as its research instrument the questionnaire. The quantitative research was carried out in the Operational Management Service of the J.S.C. "Red-Nord" company, and the subjects of the research were all the employees of the given department.

On the other hand, from the obtained results we can note that in the context of the energy crisis the J.S.C. "Red-Nord" company applied multiple management strategies shown in fig.1.

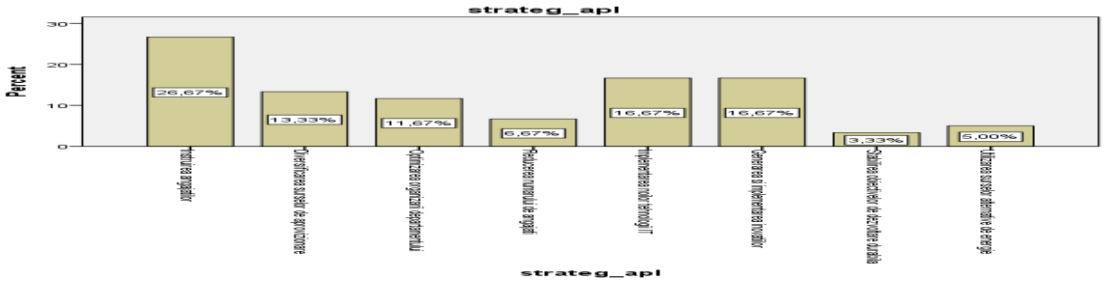

Fig. 1. Managerial strategies applied by the J.S.C. "Red-Nord" company in the crisis context

Source: developed based on the SPSS program

Analyzing the data in the figure, we notice that in the context of the crisis the J.S.C. "Red-Nord" company applied the reduction of the number of employees, with 25% of the respondents, the diversification of supply sources, which accumulated 21.7% of the respondents, the implementation of IT technologies, with 15% of the respondents. Analyzing these results, we notice that the J.S.C. "Red-Nord" applied modern strategies, which helped it to overcome the problems, imbalances and disturbances brought by the energy crisis. The main strategy remains the innovation strategy because the company has reinvented the operational management process by applying modern operational management strategies.

The research carried out allowed us to evaluate the efficiency of the operative management of electrical networks within the J.S.C. "Red-Nord" company.

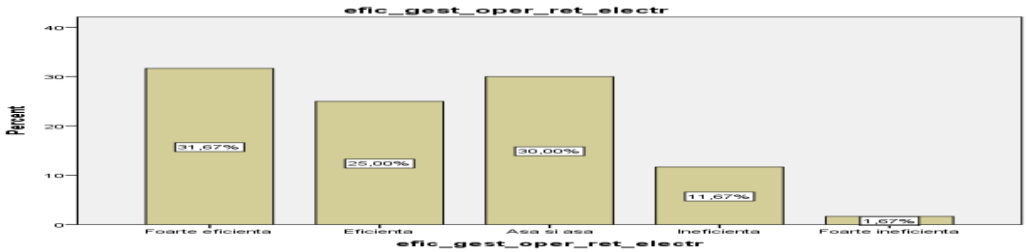

Fig. 2. Evaluation of the efficiency of the operative management of the electrical networks within the J.S.C. "Red-Nord" company

Source: developed based on the SPSS program

Analyzing the results of the research, we can see that most of the respondents, 53.3%, evaluated the efficiency of the operative management of the electrical networks with the highest level, giving it the number 4, and 26.7% evaluated the efficiency of the operative management with the number 5. In addition to this, 18.3% of the research respondents appreciated the efficiency of the operational management of the electrical networks with the number 3 and 1.7% evaluated with the number 1. The results denote an increased efficiency of the operative management of the electrical networks, a fact that points to effective managerial strategies implemented by company managers that help the company to record a high level of organizational performance.

The study allowed us to highlight the fact that in the opinion of the research respondents, in order to increase the efficiency of the operational management of the electrical networks within the company, it is necessary to make multiple changes such as the implementation of innovations and cooperation with international organizations, scored by 25 % of respondents, digitization, with 15% of respondents, and cooperation with universities noted by 13.3% of respondents.

Some demographic data of the research respondents were structured in the tables and graphs, represented next. Thus, analyzing the data presented in table 5, we notice that the average age of the respondents is 35 years (34.82). According to the value given by the median, 50% of the respondents are at least 34 years old, while the others are at most 34 years old.

Table 5. Estimation of the average of respondents' age

Descriptives

			Statistic	Std. Error
Age	Mean		34,82	1,153
	95% Confidence Interval for Mean	Lower Bound	32,51	
		Upper Bound	37,12	
	5% Trimmed Mean		34,56	
	Median		34,00	
	Variance		79,745	
	Std. Deviation		8,930	
	Minimum		21	
	Maximum		56	
	Range		35	

	Interquartile Range	18	
	Skewness	,302	,309
	Kurtosis	-,936	,608

Source: developed based on the SPSS program

Analyzing the data, we can assume that we have a skewed distribution to the right, due to a positive Skewness coefficient value = 0.302. Also, analyzing the Kurtosis coefficient, whose value is negative = -0.936, we deduce that we have a platykurtic distribution. The same thing can be observed in the figure.

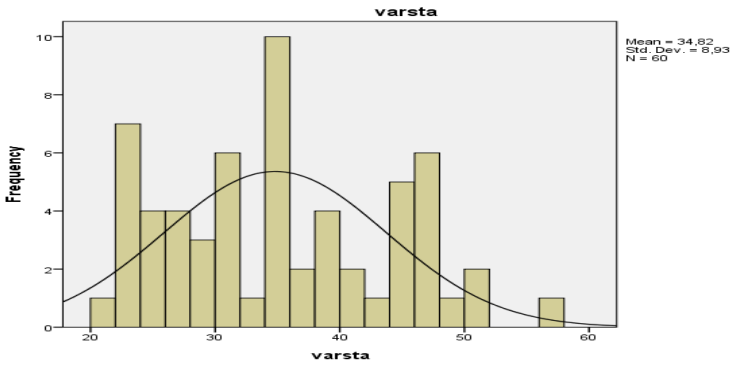

Fig. 3. Age distribution of Respondents'

Source: developed based on the SPSS program

Next, we will check the normality of the distributions for the continuous numerical variables: *age*. To do this analysis, we will resort to the Q-Q Plot and the Kolmogorov-Smirnov test. Therefore, if the analyzed variable has a normal distribution, then the Q-Q points form a line that overlaps with the line representing the theoretical distribution in this diagram.

Table 6. Kolmogorov-Smirnov Test for the variable *Age*

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
varsta	,123	60	,025	,946	60	,010

a. Lilliefors Significance Correction

Source: developed by the author in the SPSS program

In order to formulate conclusions, it is necessary to first formulate hypotheses:

- ✓ H0 – we have a normal distribution;
- ✓ H1 – we do not have a normal distribution.

We will establish the conclusion with reference to the normality of the distribution based on the sig's. Thus, according to the data in table 6., we observe a value sig = 0.025, which is lower than the value $\alpha = 0.05$. Therefore, sig < α, consequently we reject H0.

Conclusion: with 95% probability, we can state that the distribution for the age variable is not normal.

The same is confirmed in Figure 4., as the Q-Q points deviate from the straight line.

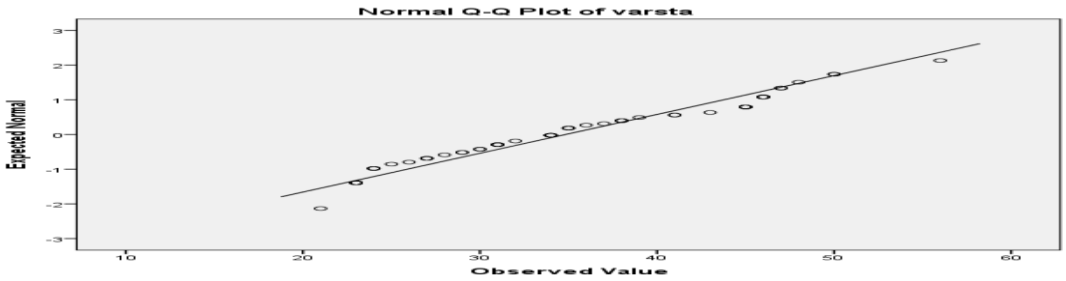

Fig. 4. Q-Q Plot Graph for the variable *Age*

Source: developed by the author in the SPSS program

Next, analyzing the structure of the questionnaire respondents by gender, we can note that 18.33% women and 81.67% men participated in the research.

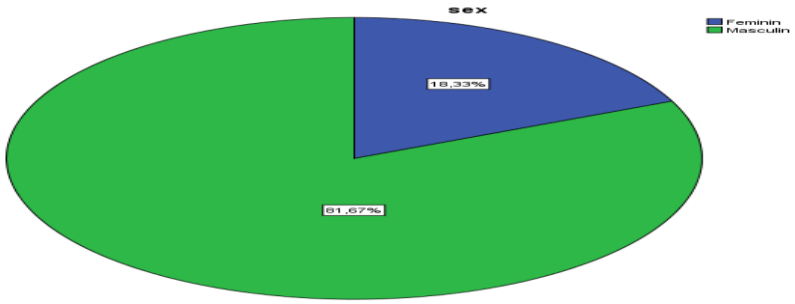

Fig. 5. Respondents' gender

Source: developed by the author in the SPSS program

According to table 7., we can see that on average, the respondents to the questionnaire proposed in the research have a working experience of 10 years (9.77). According to the median, 50% of the 60 respondents have been employed for at least 9 years (8.50) and 50% - for at most 9 years.

Table 7. Estimation of the Average Length of Respondents Seniority at Work

Descriptives

		Statistic	Std. Error
Seniority at work	Mean	9,77	,946
	95% Confidence Interval for Mean Lower Bound	7,87	
	Upper Bound	11,66	
	5% Trimmed Mean	9,33	
	Median	8,50	
	Variance	53,640	
	Std. Deviation	7,324	
	Minimum	1	
	Maximum	30	
	Range	29	
	Interquartile Range	10	
	Skewness	,781	,309
	Kurtosis	-,239	,608

Source: developed by the author in the SPSS program

Also, according to the Skewness asymmetry coefficient, whose value is positive = 0.781, we deduce that the addressed variable exhibits an asymmetric distribution to the right. If we look at the Kurtosis coefficient, we see a negative value = -0.239, which implies that in the case of the

variable length of service we have a platykurtic distribution. The same can be observed in the case of fig.6.

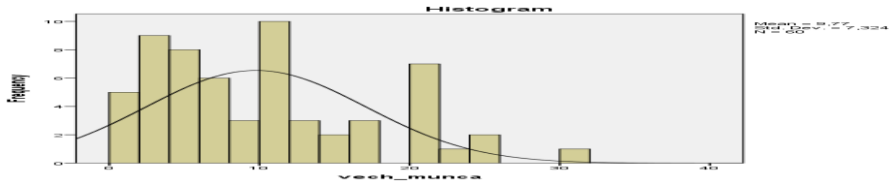

Fig. 3.6. Respondents' Distribution According to Seniority at work

Source: developed by the author in the SPSS program

Next, we will check the normality of the distributions for the continuous numerical variables: *Seniority_at work*. To do this analysis, we will resort again to the Q-Q Plot diagrams and the Kolmogorov-Smirnov test.

Table 8. Kolmogorov-Smirnov Test for the Variable *Seniority at work* (*vech_munca)*

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Seniority_at work (*vech_munca*)	,130	60	,013	,914	60	,000

a. Lilliefors Significance Correction

Source: developed by the author in the SPSS program

According to the Kolmogorov-Smirnov normality test for the *Seniority_at work* variable we have a sig = 0.013, the value of which is lower than the risk index α = 0.05. Thus, if sig < α, then we reject H0.

To formulate conclusions, it is necessary to first formulate hypotheses:

- ✓ H0 – we have a normal distribution;
- ✓ H1 – we do not have a normal distribution.

Conclusion: with a probability of 95%, we can say that for the variable *Seniority_at work* we do not have a normal distribution.

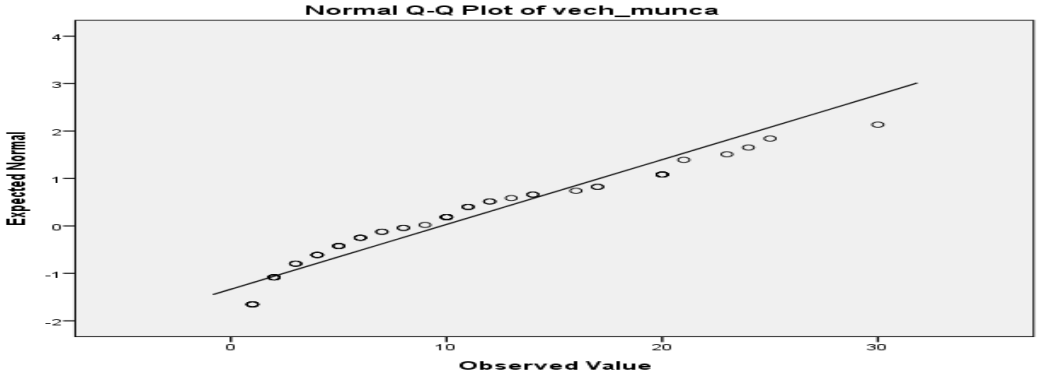

Fig. 7. Q-Q Plot Graph for the variable *Seniority_at work*

Source: developed by the author in the SPSS program

The Q-Q Plot graph confirms the previously formulated conclusion, since, as can be seen within it, the Q-Q points deviate quite a lot from the right, which shows a distribution that cannot be called normal.

Next, we can note that most of the respondents - 65% have higher education, while 28.33% have secondary education, and only 6.67% - professional education.

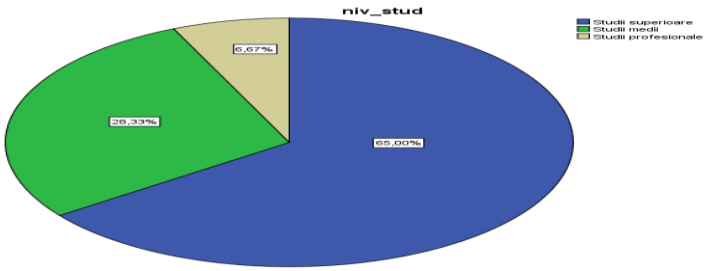

Fig. 8. Respondents' Education Level

Source: developed by the author in the SPSS program

Therefore, we can conclude that the J.S.C. "Red-Nord" employees are properly trained, which favors a more productive activity and better results. Next, we will test if there is a link between the nominal variables: strategies applied within the operative management department (*strateg_apl*) of the J.S.C. "Red-Nord" company and the level of efficiency within this department (*efic_gest_oper_ret_electr*). For this, I will resort to the Chi square test.

Table 9. Chi-Square test for the variables *strateg_apl* and *efic_gest_oper_ret_electr*

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	40,527[a]	28	,059
Likelihood Ratio	43,520	28	,031
Linear-by-Linear Association	5,425	1	,020
N of Valid Cases	60		

a. 39 cells (97,5%) have expected count less than 5. The minimum expected count is ,03.

Source: developed by the author in the SPSS program

Consequently, to test the relationship between the two variables using the Chi-square test, we first need the following statistical assumptions:

- ✓ H0 – there is a statistically significant relationship between the variables *strateg_apl* and *efic_gest_oper_ret_electr*.
- ✓ H1– there is not a statistically significant relationship between the variables *strateg_apl* and *efic_gest_oper_ret_electr*.

Following, to clarify whether there is a relationship between the variables, the calculated Chi-square value is compared with the theoretical value. We will take the calculated value from the table, this being = 40.527. The theoretical value is = 41.337.

We can also test whether the relationship between the variables is significant or not with the help of the sig value, which we still take from the table. We have a sig value = 0.059, greater than the risk coefficient $\alpha = 0.05$.

Therefore, we have χ^2calculated < χ^2 ttheoretically and sig > α, which indicates that we reject H0.

Conclusion: With a probability of 95%, we guarantee that there is a statistically significant relationship between *strateg_apl* and *effic_gest_oper_ret_electr*. Consequently, the strategies applied within the J.S.C. "Red-Nord" company influence the efficiency of the operative management.

In the same context, the changes that have occurred in recent years in the operative management of the electrical networks in the J.S.C. "Red-Nord" company were investigated. As a result, we reiterate that *in the last 10 years, the PDC service of J.S.C. "Red-Nord" has been reorganized* – the PDC service of the J.S.C. "Red-Nord" ensures the effective operational management of the company's electrical networks and focuses its efforts on increasing its efficiency and performance by connecting the system to the new requirements of the millennium, by digitizing the PDC service and increasing the quality of the services provided. Thus, in the last 10 years within the PDC service of the J.S.C. "Red-Nord" has undergone major changes. Thus, starting in 2018, under the leadership of the author of the paper, within the company, the dispatch service was reorganized and the number of employees in the service was reduced from 105 employees to 60 employees who currently work within the PDC service. As a result of the reorganizations, the company saved approximately 6 million lei annually, as well as increased the quality of the services provided, a fact highlighted by the analysis of the SAIDI and SAIFI indicators. As part of the PDC service, *the 24/24 Call Center was created* – the purpose of the call center is to collaborate with the company's customers, register customer requests, as well as avert customers by preventing the subsequent disconnections they will have within the company. The creation of the Call-center was an important step for the company because it made the work of the dispatcher more efficient.

On the other hand, the place and contribution of the human factor in the efficiency of the operational management of the electric networks was investigated, with the evaluation of the valorization and development of the human factor within the J.S.C. "Red-Nord". For this purpose, the main dynamic personnel indicators at the company level were researched.

As a result, the content of the ***INTELTEH informational program coordinated by the author of the paper*** was presented to improve the operative management of electrical networks. The program offers the possibility to make it more efficient, reduce the response time of the employees of the Operational Management Service of the J.S.C. "Red-Nord", a program

developed on European SCADA/ OMS standards, which increase efficiency and, at the same time, reduce the type of reaction of the Operative Management Service employees to the client's requests. The program has been successfully piloted and implemented within the company.

In the same context, towards the end, the main innovative managerial strategies applied by the J.S.C. "Red-Nord" in the last 5-10 years were highlighted and the impact of these strategies on the company's activity was elucidated. Therefore, in 2022 the the J.S.C. "Red-Nord" company has implemented the innovative operational management strategy that focuses on the implementation of the *Automated Measurement System* based on the intelligent metering of electricity consumption. Thus, the pilot project has already been implemented on 12 housing blocks in the municipality of Balti, which offers multiple advantages both for consumers and for the electricity distributor. In addition to this, J.S.C. "Red-Nord" implemented another innovative operative management strategy that focuses on the implementation of the Photovoltaic System that offers the possibility of generating electricity from alternative sources. This enables the company to secure approximately 20% of the company's electricity consumption.

Towards the end, proposals to improve the operative management of electrical networks within the J.S.C. "Red-Nord" company were highlighted through the prism of the implementation of innovative managerial strategies for operative management of electrical networks that will allow to increase the organizational efficiency of the analyzed company.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

As a result of the theoretical-methodological study carried out in this work, as well as because of the interpretation of the results of the empirical study, we highlight the following *conclusions:*

1. A chronological retrospective of the conceptual approaches of strategic management was carried out, with the elucidation of its own approach to the concept of innovative managerial strategy, which in our opinion represents a complex strategic approach undertaken by the company focused on the generation and implementation of innovations in the company's activity, through the prism of identifying innovative objectives and policies, which, as a result, will contribute to the improvement of the processes inside the ordinary company with the achievement of strategic competitiveness ***(paragraph 1.1., paragraph 1.2.).***

2. As a result of the research carried out, an own conceptual model of achieving innovative strategic development was developed, focused on the development and implementation of successful innovative strategies within companies. According to the model, companies are obliged to score their effective strategies, which integrate innovative activities within the company, by making improvements, optimizations, which will contribute to reducing the time of the processes, to increasing the quality and effectiveness of the tasks performed. In the context of ensuring an

innovative strategic development of companies, it is necessary to correlate the innovative strategic objectives with the innovative potential available to the company. From this perspective, companies that claim to reach a level of innovative strategic development need to set viable strategic objectives according to the potential of the ordinary company with the capitalization of success factors such as: innovative managerial processes, organizational culture and structure, potential human of companies ***(paragraph 1.3.).***

3. The research carried out allows highlighting a firm commitment assumed by the EU and strengthening the efforts of the member states in achieving energy safety and security. Moreover, we highlight the fact that in recent years the EU has adapted its regulatory framework in the energy sector to the effort to improve the efficiency of electricity consumption, a fact that positively affected the results obtained by the EU states in capitalizing on electricity sources and achieving energy efficiency. For this purpose, the EU has implemented various innovative strategies both through the lens of connecting the regulatory framework and through the lens of the measures implemented within the member states to reduce electricity consumption. At the same time, the EU adopted a series of commitments to increase its energy efficiency by 30% and interconnection by 15% by 2030. These commitments denote the solid approach of the EU in increasing energy efficiency, reducing the negative impact of the energy sector on the environment, as well as diversifying and strengthening the capacities of renewable energy sources produced by the EU states ***(paragraph 2.1.).***

4. As a result of the studies carried out, we highlight that the energy sector in the Republic of Moldova is fragmented, vulnerable, hard to adapt to the new context imposed by the energy crisis. The country's energy sector faces profound problems related to outdated infrastructure and technologies, poor management, which requires the authorities to implement restructuring measures, adapting the energy sector to the new values imposed by the energy crisis. One of the most important problems facing our country in the electricity sector is the dependence on import sources, which massively reduce the flexibility of the sector, on the one hand, but also its efficiency, on the other. At the same time, the multiple problems related to the supply of electricity, the major pressure of import prices are "sapping" the opportunities for development and modernization of the sector ***(paragraph 2.2.).***

5. The need to restructure the country's electricity sector becomes a vital necessity, punctuated by the requirement to connect the sector to the principles of sustainability. Along with the solid commitments of the EU countries to reduce and improve the efficiency of electricity consumption as well as the negative impact on the environment, the Republic of Moldova must also firmly engage in adapting the system to the new deficit context. This assumed approach can help the country in shaping the flexibility and mobility of the sector, by applying innovative managerial strategies, aimed at modernization and optimization, digitization and efficiency, on the one hand, but also at

increasing the sustainability of the electricity sector, on the other hand. In our opinion, a first step in this endeavor is the harmonization of legislation and the adoption of commitments to achieve energy efficiency. To increase the energy security of the country, the authorities of the Republic of Moldova have undertaken to diversify the sources of electricity supply, to get closer to the energy market in the European Union, through Romania, but also to diversify the electricity supply possibilities of the country from domestic sources by intensifying the generation of electricity from non-traditional sources. Although this requires time and colossal investments, it still represents a strategic objective for our country, to overcome the energy crisis created at the country level, but also to reduce dependence on electricity imports ***(paragraph 2.2.).***

6. The epicenter of the problems in the electricity sector of the Republic of Moldova gravitates to the operative management sector within the energy companies (DSO). The management of the operational management in the electricity enterprises in the country is ensured by the companies responsible for the distribution of electricity. The operational management sector within the energy companies in the country is characterized by the lack of a modern infrastructure, which would allow the energy companies efficient operational management, together with the lack of sufficient investments in the digitization of the operational management, which prevents the efficiency of this sector ***(paragraph 2.3.).***

7. The complexity and diversity of the problems in the electricity sector in the Republic of Moldova points to the urgent need to apply alignment measures to the approach of achieving sustainability in the energy sector, and energy security becomes a real challenge for the whole world. In the context of achieving sustainability, the International Electric Energy Council developed the concept of the "*energy trilemma*", which means that "energy should be green, safe and available for all" which includes three dimensions: energy security which boils down to managing efficient supply of primary energy from internal and external sources, the reliability of the energy infrastructure and the ability of energy suppliers to meet the current and future demand for electricity; accessibility, which boils down to the fact that all segments of the population have access to energy; environmental sustainability, focused on the development of energy supply from renewable and other low-carbon sources. The most sustainable countries in energy management, according to the World Energi Trimela Index, are Sweden, Switzerland, Norway, which have restructured their energy systems and anchored them harmoniously on the principles of sustainability. Regrettably, the Republic of Moldova holds position 61 according to this index, a fact that points to the urgent need to restructure the energy system and its rapid anchoring on the principles of sustainability ***(paragraph 2.4.).***

8. Starting from 2018, the electricity distributor in the northern region of the Republic of Moldova, J.S.C. "Red-Nord", made the operative management of the electrical networks more efficient by means of the restructuring of the dispatching service, under the leadership of the author of the work, which contributed to the reduction of dispatchers involved in the management process,

the reduction of operational expenses, the duration of interruptions from the network, but, at the same time, the reform of the dispatch service contributed to the increase of the performance and economic efficiency of the company, the speed of solving the problems of the company's consumers, through the opening of the Call-center, but also by increasing the satisfaction of the final consumers. The restructuring of the dispatch service was carried out in accordance with the European models of efficient operational management of electricity distribution operators. Due to the restructuring, the number of dispatchers in the dispatch service was reduced by approx. a third, however, became more competitive, more efficient, and faster. Thus, the beneficial effects of the restructuring of the operational management of the electricity networks carried out by the J.S.C. "Red-Nord" were reflected in the reduction of interruptions of the final consumers of the electricity network, by reducing the average duration of an interruption and the lack of scheduled interruptions unannounced, of the lack of compensation paid by the company to its consumers. These quality indicators recorded by J.S.C. "Red-Nord", because of the restructuring of the dispatch service, indicate the efficiency and performance achieved by the dispatch service team within J.S.C. "Red-Nord". Moreover, because of the reorganization of the company's dispatch service, the salary expenses of the PDC service employees reached the value of 18,311,226 lei. The economic effect of the reorganization of the dispatch service of the company J.S.C. "Red-Nord" is a significant one, the company saving 12,895,279.4 lei annually for the maintenance of the PDC service ***(paragraph 3.1.).***

9. Following the empirical study carried out in the work, we highlight that the main internal factor that manifests a decisive impact on the operative management of the electrical networks within the company J.S.C. "Red-Nord" is the company's employees, noted by 31.7% of the survey respondents. On the other hand, the main external factor with a significant impact on the operative management of the electrical networks within the company is the economic situation in the country, noted by 36.7% of the survey respondents.

10. In the period 2018-2023, the company's personnel indicators register positive trends – an increase in the dynamics of hiring and resignations is witnessed, the indicators of personnel movement are also increasing, Thus, if the entry coefficient recorded in 2018, the value of 0.07, then in the year 2023, it reaches 0.1, or an increase of 0.03. On the other hand, we can notice an increase in the coefficient of outputs, where in the analyzed period we see an increase of 0.3 from 0.6 in 2018 to 0.1 in 2023. And the coefficient of the total movement of employees in the analyzed period increases from 0.14 in 2018 to 0.21 in 2023 or increasing by 0.07 ***(paragraph 3.2.).***

11. In the last 5 years, the J.S.C. "Red-Nord" company has implemented several innovative strategies such as:

- restructuring of the dispatch service ***at the proposal of the author of the paper*** – the company restructured the dispatch service according to European models, creating a central dispatch group service and a 24/24 customer service group. The opening of the 24/24 Customer Service

Group offered the opportunity to considerably increase the speed of solving end-consumer problems and complaints, along with streamlining the communication process with the company's end-consumers. The quality indicators of the operative management of the electrical networks within the J.S.C. "Red-Nord" indicate beneficial effects of the restructuring, but the customers also feel the company's care ***(paragraph 3.2.).***

- the implementation of the *Automated Measurement System* which is based on the intelligent metering of electricity consumption. Thus, the pilot project has already been implemented on 12 housing blocks in the municipality of Balti, which offers multiple advantages for both consumers and the electricity distributor;

- in 2022 the J.S.C. "Red-Nord" company, under the leadership of the author of the paper, implemented another innovative operational management strategy that focuses on the implementation of the *Photovoltaic System* that offers the possibility of generating electricity from alternative sources. This enables the company to secure approximately 20% of the company's energy consumption ***(paragraph 3.3.);***

- implementation, ***at the proposal of the author of the paper***, of the INTELTEH program - the informational program was successfully piloted and implemented within the J.S.C. "Red-Nord" company. The program focuses on the Planning of disconnections from the network, a fact that streamlines the operative management of electrical networks, reducing the time of interruptions, on the one hand, but also streamlining the relational management with the company's customers ***(paragraph 3.3.);***

Following the complex, deep and multilateral theoretical-methodological approach, in the context of streamlining commitments and alignment with international standards, we consider relevant the implementation of the following ***recommendations:***

To the Central Authorities:

1. The deep energy crisis, the ossified energy system, the outdated infrastructure, point to the need for the Republic of Moldova to focus its strategic approach towards the ***adoption and implementation of multiple innovative strategies in the energy sector*** – effective innovative strategies would help the country to expand its national renewable energy generation capacities, modernize electricity sector and achieving energy efficiency. Although we are aware that this approach is an extremely complex one, however, these commitments can be achieved through the lens of increasing investments in the energy sector, accelerating the adaptation of the regulatory framework to the strategic context, as well as anchoring the system on the principles of sustainability.

2. In the light of the national commitments to align with the Sustainable Development Goals, stated by the 2030 Agenda, including SDG 7 "Clean and affordable energy", the need ***to adopt investment programs to increase national renewable energy capacities*** emerges. Installing solar

panels, wind turbines, insulating homes, adopting ecological transport, will reduce greenhouse gases, along with increasing energy security and efficiency.

3. In the context of the strategies adopted by the EU states in order to align the electricity sectors with the principles of sustainability, on the one hand, but also in the light of the national commitments to align with the principles of safety and energy efficiency, we consider it necessary ***to develop a National Strategy for achieving sustainability in the electricity sector***, and to report the annual results obtained by the companies in this sector. The strategy must include quality indicators that would allow companies to align with the global effort to reduce the sector's negative impact on the environment. Moreover, it will raise awareness, on the one hand, but also mobilize the efforts of companies to adopt measures to reduce the negative impact of the sector.

To DSOs from the Republic of Moldova:

4. In the context of the effort to achieve energy efficiency, we consider it necessary ***to allocate investments to restructure the operational management of electricity networks and digitize the electricity companies*** (DSO) in the country. The restructuring of operative management will contribute to increasing the performance of companies in the sector by approximately 15-20%, on the one hand, but will also make the process of aligning national companies to international standards more efficient. At the same time, we believe that digitization, through the integration of information technologies, software, Artificial Intelligence, will help reduce energy losses, risks, on the one hand, along with increasing energy efficiency, on the other hand.

To J.S.C "Red-Nord":

5. In order to improve the operational management of electrical networks within the J.S.C. "Red-Nord", we consider it necessary ***to restructure the Central Dispatch Point service and digitize the operative routing through the 0.4kV dispatcher*** – this extensive reform will help in the restructuring of the Central Dispatch Point (PDC) and the Low Voltage Dispatch Points (PDJT). Currently, a large volume of work for the PDJT dispatcher is the redirection of teams according to the requests received from consumers and their registration in the operative register, the SAIDI register, etc. After the implementation of the software, the teams in the field must have direct access to the program with requests and depending on the geographical location, but also after the waiting time of the requester (which currently must not exceed 6 hours) the algorithm will propose the next request for execution. On the way to the next request, the electrician will check the type of typical work that was performed and the materials that were needed to eliminate the disturbance. This would allow the automatic preparation of monthly work execution and material scrapping reports. After the implementation and testing of the software, it will be possible to reform the PDJT in several stages

- liquidation of PDJT from Briceni, Drochia, Edinet, Falesti, Floresti, Ocnita, Riscani, Rezina, Singerei and Soroca;

- unification of the low voltage dispatching point in Balti office, with the physical relocation of

PDJT Donduseni and Ungheni in this office with the following advantages:

- the unification of PDC with PDJT and the formation of 4 mixed dispatches of 4x5 people each. The given reform will allow to optimize a superior dispatcher and 2x5 PDJT dispatchers.

6. To increase the efficiency of the operational management of electrical networks, we consider it appropriate ***to implement SCADA 0.4V*** – thanks to the installation of smart meters, the implementation of SCADA 0.4V will provide the possibility to transmit and record data directly from the site, which will make the work of technicians more efficient and will allow the monitoring of quality indicators of electricity distribution.

7. To improve the operational management of electrical networks, we consider it necessary ***to expand SCADA 10kv***, which involves updating and expanding the existing SCADA/OMS system by modernizing the software and integrating more and more functions and possibilities. As an example, we propose the installation of a software application for planning and dispatching the maintenance of distribution networks, namely the module for strict records of authorizations and work orders. This module will be linked with the application, where the personnel in charge of the corresponding production sectors will have the opportunity to fulfill the authorization or work order directly from the phone or personal computer. After the authorization will be drawn up properly and signed with the electronic signature, it will reach the dispatcher through protected channels. Next, this authorization or disposition will be automatically recorded, the dispatcher will check the correctness of the formation of the authorization. Extending your existing SCADA/OMS system will become a comprehensive, cost-effective solution that will help reduce outage duration by locating outages faster and provide better information for directing response. The system will use the most current state of the network and an advanced prediction engine to respond to outages in a more informed and efficient way.

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ADNOTARE

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Structura tezei: adnotare, introducere, trei capitole, concluzii și recomandări, bibliografie din 223 de titluri. Conținutul lucrării este expus în 174 de pagini text de bază până la bibliografie, 47 tabele, 65 figuri, 14 anexe.

Rezultatele obținute au fost publicate în 16 de lucrări științifice.

Cuvinte-cheie: management, strategii manageriale, sistem de management, management energetic, energie electrică, distribuția energiei electrice, sistem energetic, rețele electrice, gestiune operativă a rețelelor electrice .

Scopul cercetării constă în dezvoltarea abordărilor teoretico-metodologice ale perfecționării sistemului managerial al întreprinderilor sectorului de energie electrică din Republica Moldova, prin identificarea celor mai relevante strategii manageriale în gestiunea operativă a rețelelor electrice capabile să direcționeze sistemul de management al întreprinderilor spre principii de bazate pe siguranță energetică, eficiență, sustenabilitate.

Obiectivele cercetării: cercetarea abordărilor teoretico-metodologice privind managementul strategic și strategiile manageriale aplicate în mediul de afaceri; identificarea caracteristicilor strategiilor manageriale și a politicilor aplicate de întreprinderile din sectorul de energie electrică din țările dezvoltate; evidențierea celor mai potrivite strategii manageriale pentru atingerea eficienței energetice și sustenabilității aplicate de țările devoltate; evaluarea indicatorilor de performanță ai sectorului de energie electrică al UE și al Republicii Moldova; evaluarea strategiilor de gestiune operativă a rețelelor electrice aplicate în cadrul S.A. „Red-Nord”; elaborarea direcțiilor de eficientizare a gestiunii operative a rețelelor electrice în cadrul S.A.„Red-Nord”.

Noutatea și originalitatea științifică: constă în abordarea complexă a redimensionării sistemului de management al companiilor din sectorul de energie electrică apelând la strategii manageriale inovaționale în gestiunea operativă a rețelelor electrice. Totodată, cercetarea a permis de a identifica cele mai reușite metode, tehnici și strategii care vor ajuta companiile din sectorul de energie electrică să-și remodeleze sistemul său managerial în contextul perfecționării gestiunii operative a rețelelor electrice. În același context, demersul de cercetare a oferit posibilitatea de a evalua specificul strategiilor manageriale ale companiilor energetice, modele de management specifice pentru companiile din sectorul de energie electrică și de a elucida posiblități de perfecționare a lor în contextul atingerii sustenabilității.

Rezultatele noi obținute constau în dezvoltarea abordărilor teoretice privind strategiile manageriale aplicate în sectorul de energie electrică; evaluarea strategiilor manageriale aplicate de companiile sectorului energetic din Republica Moldova și evaluarea performanțelor aplicării lor; evaluarea strategiilor manageriale în gestiunea operativă a rețelelor electrice aplicate de S.A. „Red-Nord”;; elaborarea unui program în vederea creșterii performanțelor gestiunii operative a rețelelor electrice a companiilor din acest sector; identificarea direcțiilor de perfecționare a gestiunii operative a rețelelor electrice în cadrul S.A. „Red-Nord”.

Soluționarea problemei științifice importante constă în fundamentarea, din punct de vedere științific și metodologic, a conceptului de strategii manageriale în gestiunea operativă a rețelelor electrice, fapt ce a confirmat importanța identificării celor mai relevante strategii manageriale care ar ajuta companiile din acest sector în creșterea performanțelor gestiunii operative a rețelelor electrice.

Semnificația teoretică: cercetarea realizată formează o contribuție valoroasă pentru știința managerială pe dimensiunea gestiunii operative a rețelelor electrice, prin îmbogățirea cadrului teoretic și conceptual în acest sector.

Valoarea aplicativă: este redată prin prisma faptului că, rezultatele obținute în prezenta lucrare pot fi utilizate pentru eficientizarea gestiunii operative a rețelelor electrice în companiile din acest sector, care vor oferi posibilitatea creșterii performanțelor obținute de aceste companii.

Implementarea rezultatelor științifice: rezultatele obținute în cadrul lucrării au fost implementate în cadrul companiei S.A. „Red-Nord”, precum și în cadrul Agenției Naționale de Reglementare în Energetică (ANRE).

ANNOTATION

Corbu, Viorel. "Innovative strategies in the operational management of electrical networks". Thesis of Doctor in Economic Sciences, Chisinau, 2024.

Structure of the thesis: annotation, introduction, three chapters, conclusions and recommendations, bibliography including 223 sources. The content of the paper is presented in 174 pages of main text to the bibliography, 47 tables, 65 figures, 14 annexes.

The results of the thesis have been reflected in 16 scientific papers.

Key words: management, managerial strategies, management system, energy management, electricity, electricity distribution, energy system, electricity networks, operational management of electricity networks.

The purpose of the thesis: consists in the development of theoretical-methodological approaches to the improvement of the managerial system of the enterprises of the electricity sector in the Republic of Moldova, by identifying the most relevant managerial strategies in the operative management of electrical networks capable of directing the management system of enterprises towards principles based on energy safety, efficiency, sustainability..

The objectives of the research: to research theoretical-methodological approaches regarding strategic management and managerial strategies applied in the business environment; identifying the characteristics of managerial strategies and policies applied by enterprises in the electricity sector in developed countries; highlighting the most appropriate management strategies to achieve energy efficiency and sustainability applied by developed countries; evaluation of the performance indicators of the electricity sector of the EU and the Republic of Moldova; evaluation of the operative management strategies of the electrical networks applied within C. "Red-Nord"; the elaboration of directions for the efficiency of the operative management of the electrical networks within C. "Red-Nord"

The scientific novelty and originality of the thesis: it consists in the complex approach of resizing the management system of companies in the electricity sector by calling on innovative managerial strategies in the operative management of electricity networks. At the same time, the research made it possible to identify the most successful methods, techniques and strategies that will help companies in the electricity sector to remodel their management system in the context of improving the operational management of electricity networks. In the same context, the research approach offered the opportunity to evaluate the specifics of the managerial strategies of the energy companies, specific management models for the companies in the electricity sector and to elucidate possibilities for their improvement in the context of achieving sustainability.

New results obtained: consist in the development of theoretical approaches regarding managerial strategies applied in the electricity sector; evaluation of managerial strategies applied by energy sector companies from the Republic of Moldova and evaluation of the performance of their application; evaluation of managerial strategies in the operational management of electrical networks applied by C. "Red-Nord"; the development of a program in order to increase the performance of the operative management of the electrical networks of the companies in this sector; identifying directions for improving the operational management of electrical networks within C. "Red-Nord".

The solution of the important scientific problem consists in substantiating, from a scientific and methodological point of view, the concept of managerial strategies in the operational management of electrical networks, a fact that confirmed the importance of identifying the most relevant managerial strategies that would help companies in this sector to increase management performance operative of electrical networks.

Theoretical importance: the research carried out forms a valuable contribution to managerial science on the dimension of the operational management of electrical networks, by enriching the theoretical and conceptual framework in this sector.

Applicative value: it is rendered through the lens of the fact that the results obtained in this work can be used to improve the efficiency of the operational management of electrical networks in the companies in this sector, which will offer the possibility of increasing the performances obtained by these companies.

Implementation of scientific results: the results obtained during the research were implemented in C. „Red-Nord", as well as within the National Energy Regulatory Agency (NERA) from the Republic of Moldova.

АННОТАЦИЯ

Корбу, Виорел. „Инновационные стратегии в оперативном управлении электрическими сетями ”. Диссертация доктора в экономике, Кишинев, 2024.

Структура диссертации: аннотация, введение, 3 главы, выводы и рекомендации, библиография – 223 источников. Содержание диссертации представлено на 174 страницах основного текста до библиографии, 47 таблиц, 65 фигур, 14 приложений.

Результаты исследования отражены в 16 научных работах.

Ключевые слова: менеджмент, стратегии управления, система управления, энергоменеджмент, электричество, распределение электроэнергии, энергетическая система, электрические сети, оперативное управление электрическими сетями.

Цель исследования заключается в разработке теоретико-методологических подходов для совершенствования системы управления предприятиями энергетического сектора Республики Молдова, путем выявления наиболее актуальных управленческих стратегий, путем определения существующей политики на уровне государственный уровень, способный направить систему управления предприятиями энергетического сектора Молдовы на принципы, основанные на безопасности и эффективности.

Задачи исследования: выявление теоретико-методологических подходов в отношении стратегий управления и энергоменеджмента, выявление характеристик управленческих стратегий и политики, применяемых на предприятиях энергетического сектора Республики Молдова, выявление наиболее подходящих стратегий для оперативного управления электрическими сетей, спецификация методов управления человеческими ресурсами на предприятиях отечественной энергетики, оценка стратегии оперативного управления электрическими сетями в АО. «Red-Nord», разработка программы для повышения эффективности оперативного управления электрическими сетями А.О.«Red-Nord»..

Научная новизна и оригинальность исследования: заключаются в разработке теоретических подходов стратегий управления, применяемым в энергетическом секторе; оценка управленческих стратегий, применяемых компаниями энергетического сектора Республики Молдова, и оценка эффективности их применения; оценка управленческих стратегий в оперативном управлении электрическими сетями, применяемых А.О.«Red-Nord»;; разработка программы по повышению эффективности оперативного управления электрическими сетями предприятий данной отрасли; определение направлений совершенствования оперативного управления электрическими сетями А.О. «Red-Nord».

Полученные новые научные результаты: заключаются в разработке теоретических подходов стратегий управления, применяемым в энергетическом секторе; оценка управленческих стратегий, применяемых компаниями энергетического сектора Республики Молдова, и оценка эффективности их применения; оценка управленческих стратегий в оперативном управлении электрическими сетями, применяемых А.О. «Red-Nord»; разработка программы по повышению эффективности оперативного управления электрическими сетями предприятий данной отрасли; определение направлений совершенствования оперативного управления электрическими сетями АО. «Red-Nord».

Решение важной научной проблемы заключается в обосновании с научной и методологической точки зрения концепции управленческих стратегий при оперативном управлении электрическими сетями, что подтвердило важность выявления наиболее актуальных управленческих стратегий, которые помогли бы предприятиям в этом секторе для повышения эффективности управления эксплуатацией электрических сетей.

Теоретическая значимость диссертации: данное исследование представляет собой ценный вклад в управленческую науку о в области оперативного управления электрическими сетями, обогащая теоретическую и концептуальную базу в этом секторе.

Прикладная ценность: результаты полученные в данной работе могут быть использованы для повышения эффективности оперативного управления электрическими сетями на предприятиях данной отрасли, что даст возможность повышения эффективности полученные этими компаниями.

Внедрение научных результатов: результаты, полученные в диссертации, были внедрены в крмпаний А.О. «Red-Nord», а также в Национальном Агентстве по Регулированию Энергетики (НАРЭ) Республики Молдова.

CORBU VIOREL

INNOVATIVE STRATEGIES IN THE OPERATIONAL MANAGEMENT OF ELECTRICAL NETWORKS

521.03 ECONOMICS AND MANAGEMENT IN FIELD OF ACTIVITY

Abstract of the Doctoral Thesis in Economic Sciences

Approved for printing: 18.07.2024	Offset paper. Offset Printing.
Printing sheets: 2,0	Paper format 60X84 1/16
Circulation 20 ex.	Order No. 32

The Editorial- Polygraphy Service of the
Academy of Economic Studies of Moldova
Chisinau, Banulescu-Bodoni Str., 59, MD-2005