

Opportunities and Limitations of Strategic Planning for the Sustainable Development of the Spatial Infrastructure System of the Electric Power Industry During the Pandemic

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ABSTRACT

The authors conducted a study of the strategic planning for the sustainable development of the spatial infrastructure system of the electric power industry during the coronavirus pandemic. There were analyzed the texts of socio-economic development strategies of the subjects of the Russian Federation of the Ural macroregion and corporate strategies of electric power companies operating and being developed (or adopted) during the COVID-19 pandemic in terms of reflecting sustainable development, risks, consequences of the pandemic, quarantine restrictions and measures to prevent and neutralize them. The authors determined features of sustainable development in the sectoral and regional context. The impact of the pandemic on the content of socio-economic development strategies of the subjects of the Russian Federation has been specified in the current situation as a threat to development, but without giving details and numbers. The authors provide recommendations for improving strategic planning at the regional and sectoral levels. Regional-sectoral, system-structural approaches, and system analysis were adopted as the methodological basis. Methods: comparisons, content analysis, expert analysis.

Keywords: Strategic planning, regional infrastructure, region, electric power industry, pandemic, economic space

1. INTRODUCTION

The issues of strategic planning of sustainable development of territories and their systems in the context of the ongoing pandemic of coronavirus infection remain important. The pandemic has had a significant impact on many economic processes, activities, socio-economic development of territories, has become a deterrent to their development and a cause of instability. The existing socio-economic development strategies have shown their inefficiency, inability to withstand rapidly changing external conditions. At the same time, the need for stable and reliable electric power supply of territories has increased, which has become a necessary condition for the transformation of many economic processes, their transfer to online mode, and the functioning of life support facilities. A feature of the development of the electric power industry during the corona crisis was the growth of electricity consumption in territories remote from the center of the region, the

need to promptly resolve issues of technological connection of socially significant facilities aimed at combating coronavirus [1]. Thus, the issues of strategic planning to ensure the sustainable development of the spatial infrastructure system of the electric power industry remain of particular relevance. The purpose of this article is to study the practice of strategic planning of the spatial infrastructure system of the electric power industry during the pandemic (based on the materials of the Ural macro-region).

1.1. Review of Previous Studies

Currently, considerable experience has been accumulated in strategic planning of the territory development and their infrastructure systems. The works of regional scientists are devoted to the issues of regional strategic planning [2-5]. The study of the sustainable development of territories and their systems is presented in the works of Vazhenina T.M., L.L. Terekhova, L.I.

Abalkin, Silin Ya.P., Surnina N.M., Shishkina E.A. and others [6-10]. The analysis of the functioning of the electric power system of territories, assessments of its reliability, stability, and quality of energy supply are presented mainly in works on industry and technological topics [11-13]. The impact of the pandemic on the socio-economic development of Russian regions is considered in the works of Zubarevich N.V., Pilyasova A.M. [14-15]. The issues of shock resistance of territories during crises, its measurement, the integration of mechanisms into the system of strategic management of the development of cities and regions are considered in the works of Klimanov V.V., Marach V.G. Zhikharevich B.S. [16].

At the same time, the authors have not found any studies of strategic planning for the sustainable development of spatial infrastructure systems of the electric power industry in the context of a coronavirus pandemic.

2. MATERIALS AND METHODS

The methodological basis of the study is a regional-sectoral approach, according to which it is necessary to study the processes of development of the spatial infrastructure system of the electric power industry at the corporate and regional levels. Planning for the development of the electric power industry of the subjects of the Russian Federation belonging to the territory of the Ural macro-region as a spatial infrastructure system is carried out within the framework of several territorial associations - the Ural Federal District (hereinafter referred to as the UFD), the Ural Economic District (hereinafter referred to as the UED), the United Energy System of the Urals (hereinafter referred to as the Ural UES), as well as network infrastructure associations, which causes ambiguity in determining its territorial boundaries. By the number of subjects of the Russian Federation, the largest is the Ural UES, which includes the subjects of the UED and the UFD, as well as the Kirov region. Therefore, 11 subjects of the Russian Federation included in the Ural UES and simultaneously included in the UFD or UED were selected as a research site. The subjects under consideration have physical interconnections in space - the electric grid infrastructure, are energy dependent on each other based on electricity flows.

The regional analysis was based on the official texts of the socio-economic development strategies of the subjects of the Russian Federation, including those adopted and (or) developed during the coronavirus pandemic in the Russian Federation. The collection and analysis of texts were carried out in June 2021. Selected strategies posted in the period from July 1, 2020 to June 1, 2021 in the SAS "Upravleniye" and on the website of the Ministry of Economic Development of Russia, including at the stage of "finalized project" in order to describe the most current state of regional strategic

planning and taking into account the current situation. To study the sectoral aspect of strategic planning, strategic documents of energy-generating companies, network and technological infrastructure companies operating on the territory of the Ural macro region are considered. The parts of the strategy texts containing the concepts of sustainable development, "corona crisis/coronavirus/covid (COVID-19)/pandemic" are analyzed. As a result of the analysis, such tasks as determining the frequency of occurrence of these concepts in strategies, their content, place in the structure of the document, completeness of description, evaluation methods were solved. Methods: comparisons, content analysis, expert analysis.

3. RESULTS AND DISCUSSIONS

1. It is determined that the spatial infrastructure system of the electric power industry of the Ural macroregion has a complex spatial organization, is heterogeneous in the composition of the subjects of the Russian Federation within the framework of associations of companies for functional purposes. 9 of the 12 largest companies of the electric power industry, including nuclear, hydro, and thermal power facilities, operate on the territory of the Ural macro-region. In 2017-2019, the capacity of power plants of the Ural macroregion in the structure of the Russian Federation is constant and amounts to 21.7%. The highest values in the capacity structure in 2019 were shown by Tyumen Region (8.0%, including Khanty-Mansiysk Autonomous Okrug – Yugra – 5.6%), Sverdlovsk Region (3.9%). The share of the Udmurt Republic, Kirov, Kurgan regions, Tyumen Region without autonomous districts does not exceed 1.0% in the capacity structure of power plants of the Russian Federation for the period under review. According to the indicators of electricity consumption, the share of the Ural macroregion in the structure of the Russian Federation is $\frac{1}{4}$ (Calculated by: Technological development of economic sectors <https://rosstat.gov.ru/folder/11189>). The spatial infrastructure system of the electric power industry of the Ural macroregion is an integral part of the Unified Energy System of the Russian Federation, which provides the connection of the Ural UES and Western Siberia with the power systems of the central regions of Russia, the Middle Volga and Kazakhstan. These features affect the processes of strategic planning, goal-setting, objectives, defining the mission, understanding the sustainability of development. So, for one region and type of activity, planning can be carried out within the framework of several electric power companies (generation, technological, commercial infrastructure).

2. The content analysis of strategic planning documents of the largest generating companies of the electric power industry operating in the territory of the Ural macroregion showed that "sustainable

development" is a priority of all organizations under consideration. 33.3% of the organizations under consideration have separate documents on sustainable development. The content of the category of "sustainable development" for most companies will be defined as development in accordance with the National Standard of the Russian Federation GOST R 54598.1-2015 "Management of sustainable development". At the same time, a number of companies - the RusHydro Group (<http://www.rushydro.ru/press/news/113514.html>), JSC "Kuzbassenergo" (<https://sibgenco.ru/companies/oao-kuzbassenergo/>) do not give an exact definition of the sustainability of development, but consider it as a priority. The sustainable development goals of companies are consistent with the UN Sustainable Development Goals until 2030, adopted by the UN General Assembly resolution in 2015, as well as the principles of the Paris Agreement of December 12, 2015. Part of the companies: PJSC Fortum, PJSC Enel Russia, Inter RAO Group (<https://www.fortum.ru>; <https://www.interrao.ru/strategy/2020-2030/>; <https://www.enelrussia.ru/ru/about-us/our-vision.html>)) They will highlight the most priority sustainable development goals among the 17 UN SDGs. Gazprom Group's Sustainable Development Goals (<https://energoholding.gazprom.ru/about/>) are integrated into strategic, medium- and short-term planning systems and implemented in the company's activities. As methods and indicators for measuring sustainability, companies use international ratings, the Dow Jones World Sustainability Index (DJSI World), the DJSI Europe rating for the Electric Power sector (22.2% of companies), their own expert assessments and development indicators (77.8% of organizations). It should be noted that the most elaborated policies, documents and indicators of sustainable development relate to companies that have a foreign affiliation - PJSC Fortum, PJSC Enel Russia, JSC.

For the grid companies of the electric power industry of the Ural macroregion, the strategies of PJSC Rosseti, PJSC FGC, and the Unified Energy System of the Urals are the basis for strategic planning of the entire network infrastructure system of the region in the form of development programs and plans, while individual strategies of regional companies are not being developed (The Development strategy of Public Joint Stock Company Russian Grids and its subsidiaries (Rosseti Group of companies) for the period up to 2030 was approved by the decision of the Board of Directors on December 26, 2019 (minutes No. 388 of December 26, 2019). Annual Report for 2020 Joint Stock Company "System Operator of the Unified Energy System" dated 30.06.2021 No. 313-R. Long-term development program of PJSC FGC UES: approved by the decision of the Board of Directors, Minutes No. 243 dated 22.12.2014). Compliance with the principles of sustainable development and the UN SDGs (No. 3,4,8,7,9,11,12,15)

is part of the corporate culture of PJSC ROSSETI and is included in the corporate values of the company (The Development Strategy of Public Joint Stock Company Russian Networks and its subsidiaries (Rosseti Group of Companies) for the period up to 2030 was approved by the decision of the Board of Directors on December 26, 2019 (Minutes No. 388 dated December 26, 2019)).

IDGC of Centre and Volga Region PJSC strives to comply with the principles of sustainable development: to increase social responsibility and maintain relationships with stakeholders, as well as to minimize the negative impact on the environment (Integrated Annual Report of IDGC of Centre and Volga Region for 2020 <https://www.mrsk-cp.ru/>; The rating of reporting in the field of sustainable development 2020 was adopted by the decision of the Rating Committee of AK&M Rating Agency JSC (Minutes of the meeting of the Rating Committee No. 05-20 dated November 24, 2020). The Company has adopted documents regulating activities related to sustainable development. The sustainability assessment is based on the indicators of the AK&M Rating Agency, the Sustainable Development Reporting Rating (ESG). JSC "BESK" development sustainability assessment is based on the "BestinCSR" rating for collecting the best practices in the field of CSR (corporate social responsibility) and sustainable development in the nomination. The rest of the electric power grid infrastructure companies do not provide for separate documents on sustainable development, at the same time, the main sustainability priorities according to the UN sustainable development concept are implemented in the form of separate directions of environmental policy, social support, technological innovations, etc.

3. The analysis of the strategies of socio-economic development of the Ural macroregion in the context of the development of electric power infrastructure shows the existence of contradictions in the strategic planning of regional and infrastructural development, manifested in the presence of infrastructural constraints to achieve the strategic goal. In 8 out of 11 strategies, the development of electric power infrastructure is separated into a separate section, weaknesses, opportunities and directions of development are identified, there is information about the limitations of achieving a strategic goal in the context of infrastructure development, while the degree of their detail varies. The general targets for these documents are the focus on the implementation of the supporting function of the infrastructure: reliable satisfaction of the growing demand of territories for electricity, increasing its availability, linking space. The strategy of the Orenburg region contains a separate section on the prospective development of the electric power industry, but at the same time its current state, weaknesses, threats to development are not defined. The strategies of the Perm Krai, Sverdlovsk, and Chelyabinsk regions contain only general directions and tasks for the

development of electric power infrastructure. The unresolved contradictions of strategic planning of regional and infrastructural development predetermines the emergence of strategic risks. More than 70% of the reviewed strategies of the subjects of the Russian Federation pay attention to the risks and threats of development. The term is most often found in the strategies of the Yamalo-Nenets Autonomous Okrug, Chelyabinsk, Kurgan regions, almost not mentioned in the Kirov and Sverdlovsk regions. At the same time, some of the mentions are not directly related to the risks of implementing the strategy. As a separate section, risk management, including the development of electric power infrastructure, is presented in the strategy of the Yamalo-Nenets Autonomous Okrug. Most subjects interpret risks as threats to development and do not refer to the risks of strategy implementation, only 9% of strategies contain well-developed risk identification and management systems.

4. The impact of the pandemic on the content of socio-economic development strategies of the subjects of the Russian Federation. During the study period of the pandemic, 17 official texts of regional socio-economic development strategies were adopted and (or) developed, among which 76.5% of the documents were being developed. Among the subjects of the Russian Federation belonging to the Ural macro-region, work was carried out during this period to develop and update certain provisions of the strategies of the Chelyabinsk Region and the Yamalo-Nenets Autonomous Okrug. The authors analyzed parts of the strategy texts containing the concepts of "coronacrisis/coronavirus/COVID(COVID-19)/ pandemic)" (Table 1). As a result of the analysis, such tasks as determining the frequency of occurrence of these concepts in strategies, their content, place in the structure of the document, completeness of the description, evaluation methods, the availability of measures to minimize and neutralize the consequences were solved.

An earlier study conducted by the authors [17] of all strategies developed during this period showed that the effects of coronavirus were reflected differently in the

content of socio-economic development strategies. A qualitative analysis of the strategy texts shows that the pandemic is mentioned in assessing the current situation as a threat to development, but without specifying and quantifying it. The strategy of the Chelyabinsk Region does not mention the pandemic and its associated consequences. The concept of sustainable development in the text of the document has a descriptive character and is used in the analysis of finance, economic development, the formation of the spatial framework of settlement. The high cost of electricity, gas and water is defined as a threat to the development of the region and is the only assessment of the spatial infrastructure system of the electric power industry of the region. The strategy of the Yamalo-Nenets Autonomous Okrug takes into account the presence of a pandemic. The impact of the pandemic on regional development is descriptive and is present in the sections "Labor market", "Assessment of achievement of previously set goals", "Health system". Sustainable development is a strategic priority in most areas. The development of the spatial infrastructure system of the electric power industry has quantitative and qualitative development parameters presented in two sections: "3.1.1. Development of the fuel and energy complex", "3.1.2. Development of the energy complex and municipal infrastructure systems". The development forecast includes 2 scenarios (inertial and target), a set of key measures and task indicators. The reviewed strategies of the subjects of the Russian Federation do not provide for a possible recurrence of the pandemic, the epidemiological factor is not taken into account in most documents.

4. CONCLUSIONS

The pandemic has had a significant impact on the processes of regional development, the state of life support spheres, identified opportunities and created limitations for their long-term development. Sustainable electric power supply has become a necessary condition for the functioning of many organizations and households, providing remote employment, online work, technological connection of new facilities. These

Table 1. Analysis of the inclusion of the pandemic in the development strategies of the subjects of the Russian Federation as part of the Ural macroregion

Subject of the Russian Federation	Repeatability of the concepts "coronavirus /COVID (COVID-19)/ pandemic)"	Total concepts related to the pandemic	Assessment of the impact of the coronacrisis on the development of the territory
Chelyabinsk region	0/0/0	0	Missing
Yamalo-Nenets Autonomous Okrug	4/2/0	6	Partial
<p>Note: Evaluation criteria: Missing (not mentioned, the concept of a pandemic is not used in the text) / Comprehensive (detailed analysis of the impact of the pandemic, mentioned in more than three sections of the strategy) / Partial (the pandemic is mentioned in no more than two sections of the strategy)</p> <p>Source: compiled by the authors on the basis of official texts of strategies for socio-economic development of the subjects of the Federation</p>			

circumstances have set new challenges for the strategic planning of the development of the spatial infrastructure system of the electric power industry, both in terms of regional socio-economic development and corporate. At the same time, the strategic documents of the regional and corporate levels that are in force and being developed during the pandemic do not yet take into account the pandemic as a threat and risk of strategic development, they have contradictions in goals and objectives, and the understanding of sustainable development is realized only within the framework of the international concept of the same name, and not as shock resistance. In the conditions of the coronacrisis, it becomes necessary to form risk management mechanisms for strategic plans based on minimizing, mitigating contradictions of regional and infrastructural development, increasing the interconnection and mutual consistency of forecast and planning parameters, a unified methodology for strategic planning of territories and infrastructure complex at various stages of production, distribution and consumption of electricity.

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