

GCPMED 2018
**International Scientific Conference "Global Challenges and
Prospects of the Modern Economic Development"**

**PROBLEMS AND PROSPECTS OF ELECTRIC POWER
ENTERPRISES IN MONOTOWNS**

V.N. Pulyaeva (a)*, A.A. Gibadullin (b), E.N. Kharitonova (c), N.A. Kharitonova (d)

*Corresponding author

(a) Financial University under the Government of Russian Federation, Leningradsky Prospekt, 49, Moscow, Russia, vnpulyaeva@fa.ru, +79260602052

(b) State University of Management, Ryazan Avenue, 99, Moscow Technological Institute, Leninsky Prospekt, 38a, National Research University Moscow Power Engineering Institute, Krasnokazarmennaya 14 Moscow, Russia, E-mail: 11117899@mail.ru

(c) Financial University under the Government of Russian Federation, Leningradsky Prospekt, 49, Moscow, Russia, EHaritonova@fa.ru

(d) Financial University under the Government of Russian Federation, Leningradsky Prospekt, 49, Moscow, Russia, NAHaritonova@fa.ru

Abstract

The article presents the results of a study of the technical and economic efficiency of power industry enterprises in single-industry municipalities. The relevance of the study is due to the special role of the power industry in the development of the economy of individual regions and the country as a whole. The authors revealed that the issues of the power industry in the context of single-industry municipalities had not previously given due attention in scientific publications. The article presents a comparative analysis of a number of socio-economic indicators for single-industry towns, in which city-forming organizations are stations generating electricity. The results of the study indicate that the standard of living in these localities is relatively low. Since measures are currently being taken to diversify the economy of single-industry towns in order to create new industries and create conditions for the development of small and medium enterprises, it is important to assess the technical and economic sustainability of power plants operating in single-industry municipalities. The authors proposed a method for assessing the technical and economic sustainability of generating stations based on the use of a complex indicator that includes three particular indicators reflecting the results of comparing the actual values of the indicators used with their standard values: the specific consumption of equivalent power of the power plant, the level of use of the installed power of the power plant and profitability of sales electricity from the power plant by gross profit.

© 2019 Published by Future Academy www.FutureAcademy.org.UK

Keywords: One-industry municipalities, electric power industry, electric power plant, evaluation of engineering and economic stability, town-forming organization, socioeconomic development.



1. Introduction

Location and development of industrial production implies taking into account the principles of social division of labor and increasing labor productivity due to approaching to material and human resources, markets, etc. Such prerequisites conditioned establishing one-industry municipalities. As a rule, stability of their economic growth is ensured by a corresponding regulatory and legal framework as well as by involvement of state administration bodies into enhancing their efficiency.

The phenomenon of a monotown, or a one-industry town, or a company town, exists almost in all countries of Europe as well as in the USA and Canada (Dinius & Vergara, 2011; Gureva & Barkhatov, 2014; Hayrynen, Turunen, & Nyman, 2012; Kuznetsov, 2014; Winson & Leach, 2002). Monotowns have some common problems arising from economic cycles that affect the economic efficiency of town-forming enterprises and make an immediate impact on monotown economies. For instance, in 2015-2016 there was a rather difficult situation in Wolfsburg, Germany, the location of Volkswagen's headquarters; such situation was caused by the breach of environmental regulations by the enterprise, on the one side, and by general recession in the automobile industry, on the other side.

There are numerous examples of solutions of the monotown problem in the developed countries, like Flint and mining towns in the Appalachian Mountains in the USA, coal towns in Germany and France, Glasgow and South Yorkshire in the UK (Satybaldina, 2013; Sechina, Pokrovskaja, Fedenkova, & Kurmel, 2016; Zamyatina & Pilyasov, 2016).

Historical experience of many countries offers two solutions for the monotown problem. One of them, which is called American, suggests a gradual loss of its main economic function that results in the massive population flow to other regions with a better economic environment. Another solution, so-called European, is aimed at rehabilitation of a one-industry economy and implies investments into development of other industries, the social infrastructure, training of highly qualified human resources, and ecological purification of territories. As a result, a one-industry municipality obtains diversification in the industrial sector due to new businesses. It is obvious that the second solution requires significant investments during dozens of years, but it is more considerate to local people, who in case of the first solution (American) have to assume the settlement of problems being the functions of the socially responsible business and social state.

It should be noted that choosing the European solution for the development of monotowns implies not only significant capital investments into these regions but also the improvement of managerial and analytical tools that should facilitate the rehabilitation of the one-industry municipal economy, which is performed by state administrative bodies.

2. Problem Statement

One of the first researchers who have investigated the problems of monotowns is J. Allen. His study focused on coal mining, oil industry and forest industry towns, he used the term of *company town* (Allen, 1966). Such towns of the industrialization period feature insularity and centrality in regard of a major enterprise. J. Garner used the same term in his analytical study on monotowns in New England (Garner,

1984). H. Green studying company towns and their role in shaping of the American economy states that they are integral to the USA economy in spite of the non-American origin of the term (Green, 2011).

Another common term is *single-industry town* or *one-industry town* with the further identification of its specificity. For instance, *mining town* is a town specializing in mineral production, *railway town* is a town with the economy based on the railway sector, *college town* is a town where educational services of a major university prevail the local economy, *lumber town* is a town focused on wood production (Olshausen, 2013).

It should be noted, while different approaches applied in the world demonstrate a variety of the terms and make an emphasis on a town's specific function and regulation of property rights, the Russian legislation clearly specifies the qualitative criteria of a monotown (Table 01).

Table 01. The definition of the term of monotown in different countries

Term	Country	Description	Examples
Monotown	Russia	A town that has a population of at least 3,000 and one or more large town-forming enterprises of the same industry that employ 20% of the local work force (Decree of the RF Government No.709 of July 29, 2014)	Togliatti, Magnitogorsk Cherepovets
One-Industry Town, Single-Industry Town	USA, Great Britain, China	A town with industrial enterprises of the same industry	Birmingham, Pittsburgh, Gurao
Mill Town, Factory Town	USA, Great Britain, Germany	A town near an industrial enterprise	Manchester, Hull, Merseburg and Bitterfeld
Company Town	USA, Canada, Great Britain, Japan, India	A town that is completely owned by one company (its infrastructure, buildings, etc.)	Toyota City, Jamshedpur
Mining Town	USA, Australia	A settlement that provides workforce for a mine	Tennant Creek
Railway Town	USA, Canada	A town near railway junctions	Atlanta, Denver
Resource Town	Canada	A settlement near a mining enterprise	Glance Bay, Elliot Lake

Note: Source: compiled by the authors from Ilyina (2013).

It should be pointed out that in spite of a great number of publications on the problems of monotowns, this study has revealed neither the papers dedicated to municipalities with electric power enterprises (power generating plants) as town-forming enterprises, nor the papers considering the issues of the development of electric power engineering in monotowns belonging to different industries (like ferrous and nonferrous metallurgy, machine-building, mineral production, etc.)

At the same time, the authors believe that the issue of the electric power engineering in monotowns and electric-industry monotowns is rather relevant due to several reasons. First of all, electric power engineering is the industry that supports the entire national economy of any country. Then, as diversification is a preferable way of the monotown development, the research into a production infrastructure, and namely into electric power engineering, makes it possible to forecast the development of new manufacturing enterprises taking into account the existing and to-be-launched power generating capacities.

In this connection, the goal of this study is examination of the specific problems of one-industry municipalities with economies based on electric power enterprises as well as evaluation of potential capacities of electric power enterprises working within the monotowns' territories.

3. Research Questions

Nowadays diversification and support of monotowns are included into one of the main national programs of the Russian Federation as one-industry municipalities are considered to be real growth points of the economy. At present, the government is implementing measures for rehabilitation of monotowns including:

1. Establishing territories of priority development with the aim of attracting investments and diversification of monotown economies (thus, the establishment of the Selenginsk territory of priority development in the Republic of Buryatia according to Decree of the RF Government No.898 of July 29, 2017 will ensure diversification of the monotown economy, reduce dependence on the town-forming enterprise, the Selenginsk paper mill, improve investment prospects of the monotown, create about 2,000 permanent jobs, and raise over 10 billion rubles as investments;

2. Investment support for business projects from the regional and local budgets and from the monotown development fund established in 2014;

3. Training programs for managers of different levels (heads of administrations, representatives of investors and business companies) financed by the monotown development fund and focused on building teams that are able to implement projects on the monotown development and creating a comfortable urban environment;

4. Renovation of the infrastructure and improvement of the urban environment with the purpose of the monotown development and raising of living standards of the local people through establishing recreation areas and infrastructure facilities. For instance, the Five Step Improvement program (retrieved from <http://моногорода.рф/about>, on July 30, 2017).

The costs of support for one-industry municipalities first appeared in the RF Budget in 2015; they were included in the section of subsidies to the non-commercial organization, the Monotown Development Fund, within the framework of the subprogram aimed at establishing a favorable investment environment, which was an integral part of the RF National Program of the economic development and innovative economy (Federal Law No.384-Ф3 of December 01, 2014) The amount of 6.5 billion rubles (Federal Law No.415-Ф3 of December 19, 2016) was planned for these purposes in 2017; it was 0.04% of the total budget expenses and 3.8% of the expenses born by the Ministry of Economic Development of the Russian Federation.

The abovementioned measures are intended for mitigation of social strain in monotowns and reducing dependence on town-forming enterprises through diversification of their economies. All this causes an increase in the load on the life-supporting infrastructure of monotowns, including utilities and road facilities as well as power generating and transferring enterprises. In this regard, the authors propose a methodology for assessing the technical and economic sustainability of power plants, which can be used both in the development of a strategy for the development of specific generating stations and in mono-cities in general.

The proposed comprehensive indicator of the technical and economic sustainability of the generating station includes three particular indicators reflecting the results of comparing the actual values of the indicators used with their standard values:

1. Specific consumption of reference fuel of a power plant (the standard value is 240 gram of fuel equivalent / kwh) (Decree of the RF Government No.1178 of December 29, 2011)
2. A utilization factor of maximum capacity (the standard value is 100%);
3. Gross margin sales of electricity from a power plant (the standard value is 12%) (Decree of the RF Government No.1178 of December 29, 2011).

The specific fuel equivalent consumption describes the level of technology excellence, energy efficiency and cost effectiveness of a power generating plant and makes it possible to assess the energy-to-fuel ratio which directly determines a competitive capacity of the enterprise on the electric power market (Gibadullin & Pulyaeva, 2016).

The utilization factor of maximum capacity describes the level of demand for the product of an enterprise and indicates the demand for electric power as well as may reflect the possibility for increasing in the number of consumers and production buildup.

The gross margin sales of electricity from a power plant describes the efficiency level of a power generating plant, that allows for defining a potential opportunity of an enterprise for raising its own funds for investment projects aimed at renovation of the technological equipment.

The value of the aggregated indicator of engineering and economic stability of an electric power plant is obtained from the sum of the three abovementioned parameters expressed as relative values in relation to the basic level. The marginal value of the aggregated indicator should be at least 2.5; it indicates a stable engineering and economic state of a power generating plant (Table 02).

Table 02. Calculation of the aggregated factor describing engineering and economic stability of power generating plants

No.	Parameter	Calculation	Recommended values
1	Comparison between the standard value and the actual value of specific fuel equivalent consumption by the electric power plant.	$I_{SCCF} = \frac{240}{A_{CF}}$ <p>where I_{SFEC} (<i>Specific Fuel Equivalent Consumption (SFEC)</i>) is the comparison between the standard value and the actual value of specific fuel equivalent consumption; 240 is the standard value of specific fuel equivalent consumption, gram of fuel equivalent / KWh; A_{FE} (<i>Amount of Fuel Equivalent</i>) is the amount of fuel equivalent which was actually used by the electric power plant, gram of fuel equivalent / KWh.</p>	0.75 and over
2	Comparison between the standard value and the actual value of the utilization factor of maximum	$I_{UFMC} = \frac{RC_f}{100}$ <p>where I_{UFMC} (<i>Utilization Factor of Maximum Capacity (UFMC)</i>) is the comparison between the standard value and the actual value of the utilization factor of maximum capacity;</p>	from 0.75 to 1.0

No.	Parameter	Calculation	Recommended values
	capacity of the electric power plant	RC_f (Rated Capacity) is the actual value of the utilization factor of maximum capacity, %; 100 is a maximum possible (standard) value of the utilization factor of maximum capacity, %.	
3	Comparison between the standard value and the actual value of profitability of sales of electric power from the plant in relation to the gross profit	$I_{PS} = \frac{Ps}{12},$ where I_{Ps} (Profitability of Sales (Ps)) is the comparison between the standard value and the actual value of profitability of sales of electric power from the plant in relation to the gross profit; Ps is the actual value of profitability of sales of electric power from the plant in relation to the gross profit, %; 12 is the standard value of profitability of sales of electric power from the plant in relation to the gross profit, %.	1 and over
4	Aggregated indicator	$I_{EES} = I_{SFEC} + I_{UFMC} + I_{Ps},$ where I_{EES} (Engineering and Economic Stability (EES)) is the value of the aggregated indicator of engineering and economic stability	2.5 and over

Note: Source: developed by the authors

The authors believe that weighting factors are unnecessary for the calculation of the aggregated indicator as the significance of the particular parameters for defining engineering and economic stability of power generating enterprises is equal.

4. Purpose of the Study

The authors give the calculation of engineering and economic stability of two electric power plants, PAO OGC-2 and PAO T Plus, as an example testing of the offered method (Table 03).

The mentioned power generating plants are located in different federal districts of the Russian Federation, are the participants of the electric power wholesale market and differ in the maximum capacity and the year of putting into operation. In general, the data given in Table 03 represent the state of electric power enterprises, which is considered common for different monotowns of Russia.

Table 03. The evaluation of the electric power plants in the monotowns

No.	Plant	Town, RF region	Integrated into	Staff, person	Maximum capacity, MW
Category I monotowns with the most difficult socioeconomic state					
1	Togliatti Thermal Power Plant	Tolyatti, the Samara Region	PAO T Plus	577	620
2	Cherepovets State District Power Plant	Cherepovets, the Vologda Region	PAO OGC-2	557	1 050

Category II monotowns with the risks of declining the socioeconomic state					
3	Krasnoyarsk State District Power Plant-2	Zelenogorsk, the Krasnoyarsk Territory	PAO OGK-2	882	1 260
4	Mednogorsk Thermal Power Plant	Mednogorsk, the Orenburg Region	PAO T Plus	38	14
5	Sarapul Thermal Power Plant	Sarapul, the Republic of Udmurtia	PAO T Plus	99	390

Source: compiled by the authors from the websites of PAO OGK-2 and PAO T Plus

At the first stage of the evaluation of engineering and economic stability of the generating plants it is appropriate to study the dynamics of the individual components of the aggregated indicator.

The dynamics of the specific fuel equivalent consumption of the five generating plants shown in Figure 01 represents the fact that only the Sarapul Thermal Power Plant met the standard value (240 gram of fuel equivalent / KWh) during the whole period of the study.

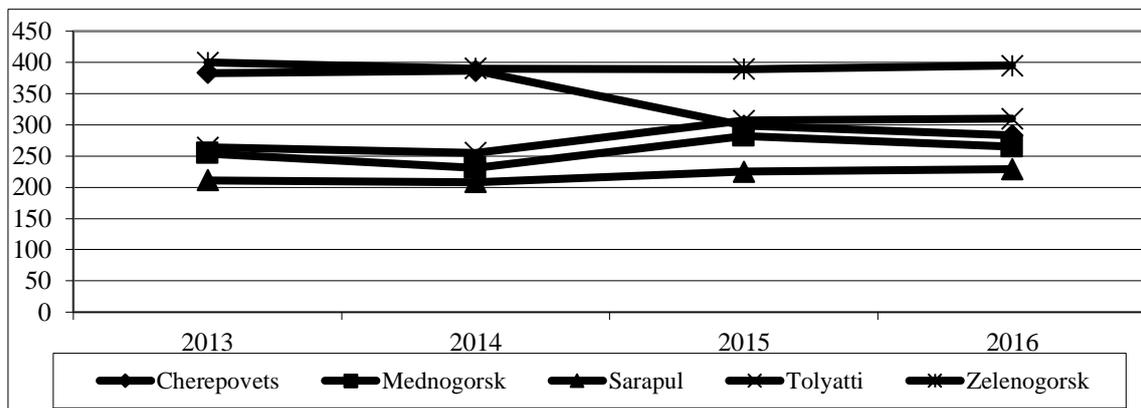


Figure 01. The specific fuel equivalent consumption of the evaluated electric power plants in the monotowns, gram of fuel equivalent / KWh

Source: compiled by the authors from the websites of PAO OGK-2 and PAO T Plus

The calculation results of the utilization factor of maximum capacity (Figure 2) state that none of the generating plants under study has full utilization of the maximum capacity. The value of the utilization factor of some plants (Krasnoyarsk State District Power Plant-2 and Cherepovets State District Power Plant) varies, and the same value of the rest plants under study tends to decline. At the end of the observation period all the plants were loaded at most at half power. For instance, in 2016 Togliatti Thermal Power Plant deployed only 34.3% of its maximum capacity. The obtained data evidence that, on the one side, these monotowns reduce the consumption of electric power generated by the plants under study, and on the other side, these generating plants have potentials for the buildup of electric power generation for new consumers.

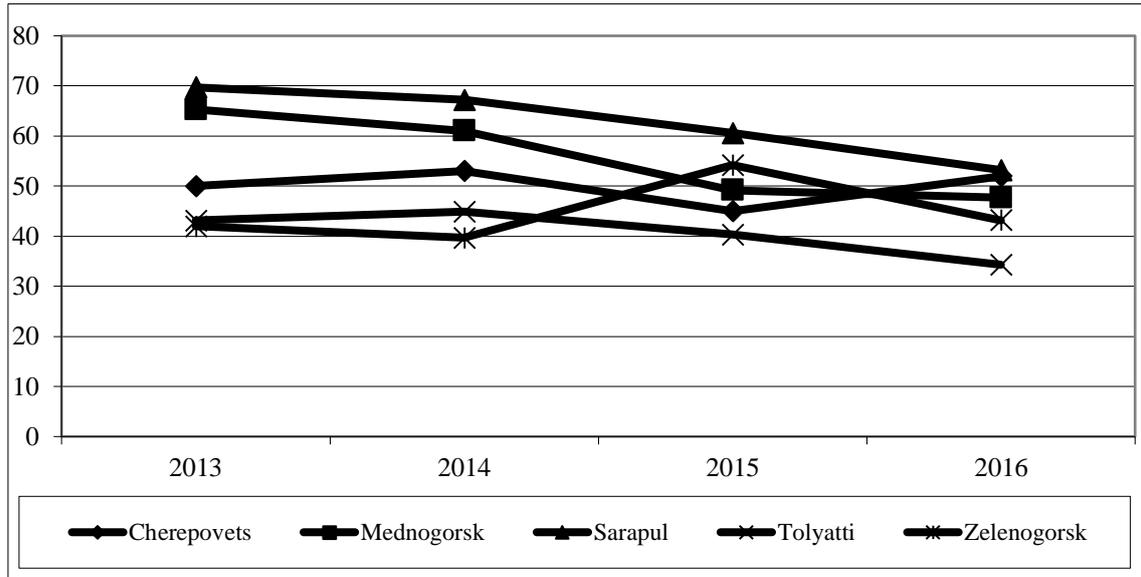


Figure 02. The utilization factor of maximum capacity of the evaluated electric power plants in the monotonowns, %

Source: compiled by the authors from the websites of PAO OGK-2 and PAO T Plus

The dynamics of the profitability-of-sales parameter of the largest generating companies of Russia ranges within the threshold requirements to the profitability standard value; it suggests the limited opportunities for investment projects financed from the own funds of the companies (Figure 03).

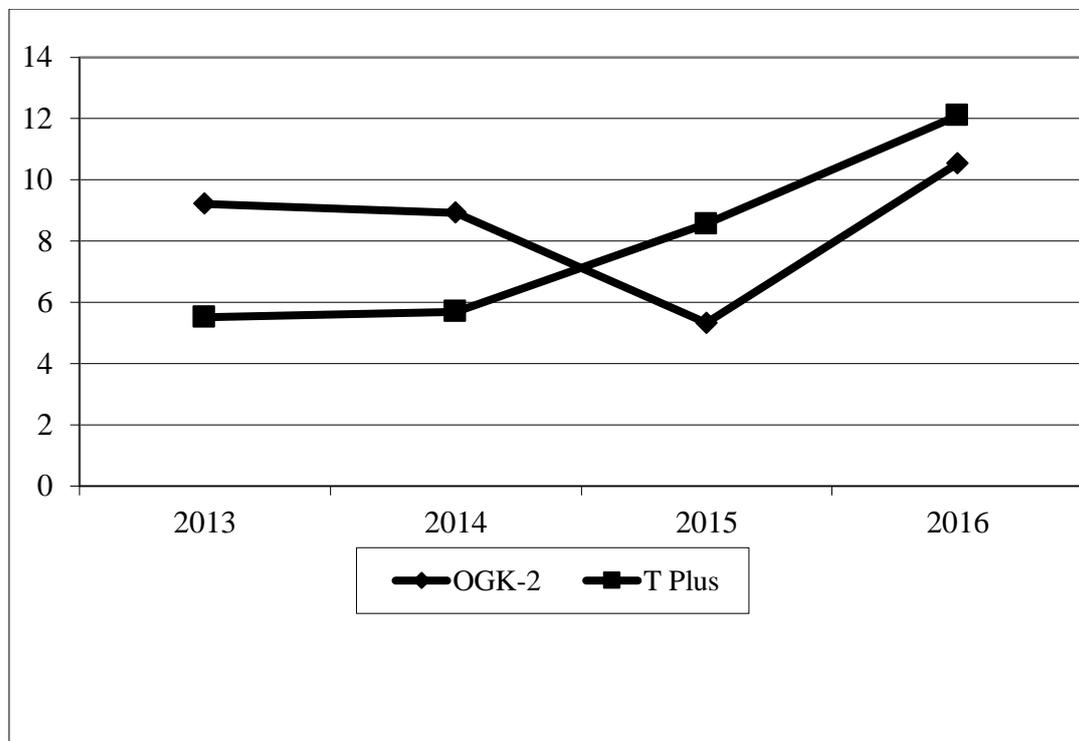


Figure 03. The profitability of sale of PAO OGK-2 and PAO T Plus, %

Source: compiled by the authors from the websites of PAO OGK-2 and PAO T Plus

The authors calculated the aggregated indicator for the period of 2013-2016 for the purpose of the comprehensive evaluation of the engineering and economic stability of the generating plants located in the monotowns (Table 04).

Table 04. The aggregated factor of the engineering and economic stability of the evaluated electric power plants in the monotowns in the period of 2013-2016, units

No.	Plant	2013	2014	2015	2016	Average
Category I - monotowns with the most difficult socioeconomic state						
1	Togliatti Thermal Power Plant	1,80	1,86	1,90	2,13	1,92
2	Cherepovets State District Power Plant	1,89	1,90	1,70	1,80	1,82
Category II monotowns with the risks of declining the socioeconomic state						
3	Krasnoyarsk State District Power Plant-2	1,79	1,76	1,60	1,92	1,77
4	Mednogorsk Thermal Power Plant	2,06	2,12	2,06	2,39	2,16
5	Sarapul Thermal Power Plant	2,29	2,30	2,39	2,59	2,39
Average		1,97	1,99	1,93	2,17	2,01

The results of the evaluation showed that none of the electric power plants under study had attained even the minimum value of the aggregated indicator within the entire period of observations; it demonstrates a rather low level of their competitiveness.

5. Research Methods

The authors state that the evaluation procedure of engineering and economic stability of electric power enterprises should pay a special attention to the towns with the generating plants being their town-forming enterprises. The living standards in such municipalities entirely depend on economic efficiency of the electric power plant.

At the same time, the Russian electric power industry in general faces an excessive wear of core process equipment and poor performance that is first of all caused by an incomplete load of generating capacities and significant losses of power in the electric grids used for delivering electricity to consumers (Chernov & Filchenkova, 2015; Kuznetsov, 2014; Russkov & Saradgishvili, 2015). The stiff tariff regulation of the electric power market and the X-efficiency factor inherent for natural monopolies still deteriorate the situation. The X-efficiency factor refers to the situation when the actual costs of the production process exceed the average aggregate costs due to low motivation of the management staff, a lack of improvements, etc. The term was proposed by Harvey Leibenstein (Leibenstein, 1966) All this results in the instable economic state of the generating plants being town-forming enterprises and therefore in the instability of the municipal economy of monotowns.

According to the Russian industry classification, the List of Monotowns includes 319 settlements, and only six of them have electric power enterprises as town-forming organizations. The five one-industry municipalities have a combined heat and power plants, and the town-forming enterprise of the sixth monotown is a nuclear power plant (Table 05).

Table 05. The one-industry municipalities with electric power enterprises as town-forming organizations

No.	Municipality (its reference number in the List of Monotowns) and RF region	Monotown population, person	Town-forming enterprise	Staff of town-forming enterprise, person
Category I monotowns with the most difficult socioeconomic state				
1	Kaltan (No.30), the Kemerovo Region	21,784	Southern Kuzbass State District Power Plant (OAO Mechel)	1,589
2	Krasavino (No.12), the Vologda Region	6,432	Krasavino GT Thermal Power Plant (a branch of the Vologda state power enterprise)	95
Category II monotowns with the risks of declining the socioeconomic state				
3	Gusinoozersk (No.186), the Republic of Buryatia	23,436	Gusinoozersk State District Power Plant (a branch of OGGK-3)	1,072
4	Luchegorsk (No.179), the Primorye Territory	19,886	Luchegorsk Fuel and Energy Complex, Luchegorsk Opencast Coal Mine (branches of PAO DGK)	1,498
Category III monotowns with the stable socioeconomic state				
5	Suvorov (No.311), the Tula Region	17,615	Cherepet State District Power Plant (a branch of PAO OGGK-3)	798
6	Udomlya (No.307), the Tver Region	28,669	Kalinin Nuclear Power Station (a branch of the Rosenergoatom state enterprise)	3,700

Note: Source: compiled by the authors from the List of Monotowns, the municipalities' websites and the electric power plants' websites (The Vologda state power enterprise. URL: <http://voce.ru>; Southern Kuzbass State District Power Station. URL: <http://www.ukgres.ru>; PAO DGK. URL: <http://www.dvgk.ru>; PAO OGGK-3. URL: <http://www.ogk3.ru>).

The comparative analysis of some socioeconomic parameters shows that Russia's electric-power-industry towns have the living standards that are significantly lower than the average for the country (Table 06).

Table 06. The comparative analysis of the socioeconomic state in the electric-power-industry towns as of the beginning of 2017

No.	Monotown	Population, person	Longevity (in the region), years	Average salary, ruble	Unemployment rate, % of the labor pool		Subsistence wage, ruble	Social stability factor
					2014	2016		
Category I monotowns with the most difficult socioeconomic state								
1	Kaltan	21,186	67.8	24,773	3.4	3.1	9,019	1.83
2	Krasavino	6,194	69.74	22,205	14.6	8.2	10,356	1.43
Category II monotowns with the risks of declining the socioeconomic state								
3	Gusinoozersk	23,359	68.54	31,762	8.4	2.6	9,582	2.21
4	Luchegorsk	19,578	68.74	21,215	11.4	2.34	12,556	1.12
Category III monotowns with the stable socioeconomic state								
5	Suvorov	17,615	70.06	24,960	3.2	2.4	9,219	1.80
6	Udomlya	28,669	66.10	31,724	N/A	1.67	9,831	2.15
Russian Federation (total)			70.93	36,746	7.5	5.4	9,909	2.47

Note: Source: compiled by the authors from the municipalities' and federal regions' websites, statistic data and the own calculations (http://www.statdata.ru/spg_reg_rf, <http://trud.com/salary>, <http://potrebkor.ru>, <http://www.vologda-oblast.ru>, <http://www.ako.ru>, <https://www.tularegion.ru>, <http://www.primorsky.ru>)

The social stability factor referenced in Table 6 is calculated as the relation of the average salary to the subsistence wage multiplied by 1.5 times as employees support financial dependents, and on average two employees have one underage dependent, according to the Russian Federal State Statistics Service. The recommended value of the social stability factor is at least 4 (Kharitonova, 2012).

Thus, the average salary in the monotowns of the electric power industry is almost 30% lower, and the expected longevity is 3.4% lower than Russia's average level. In addition, the current social stability factor of the monotowns under study is two times lower than the recommended value. The only positive parameter is the unemployment rate; as in the most monotowns discussed by this paper the unemployment rate is 40% lower than Russia's average value. It can indicate the outcomes of the programs implemented in these monotowns, which are aimed at increasing the number of workplaces due to establishing new manufacturing enterprises and supporting small businesses. This fact also suggests that the more intensive implementation of the national program for the monotown development will cause a greater loading of the generating enterprises; therefore, it is essential to perform comprehensive evaluation and estimation of their engineering and economic stability.

6. Findings

The authors have calculated the value of engineering and economic stability of the town-forming power plants as a case study of Gusinozersk State District Power Plant and using materials of the OGK-3 (the data of the rest electric power plants under study are not publicly available as they are an integral part the major electric power companies that present only consolidated reporting without any details) website (Table 07).

Table 07. The engineering and economic stability of Gusinozersk State District Power Plant (a branch of OGK-3) located in Gusinozersk, the Republic of Buryatia, a Category II monotown with the risks of declining the socioeconomic state

No.	Parameters	2013	2014	2015	2016	Average
1	Specific fuel equivalent consumption, gram of fuel equivalent/KWh	363.6	366.2	367.5	359.2	364.13
2	Utilization factor of maximum capacity, %	49.83	47.7	45.2	45.7	47.11
3	Profitability of sale, % (the total value of OGK-3)	-4.70	-1.43	6.39	6.09	1.59
4	Aggregated indicator, units	0.77	1.01	1.64	1.63	1.62

Note: Source: compiled by the authors from the Gusinozersk State District Power Plant website.

The calculation results allow for the conclusion that the state of the electric power plants in the monotowns with the developed industrial production can be considered to be more favorable in comparison with the state of the electric power plants in the monotowns without any other developed industrial production except the electric power industry.

Thus, the insufficient engineering and economic stability of the electric power plants in the Russian monotowns and some negative trends of the parameters under study make us conclude that it is appropriate to take urgent measures (also by governmental and municipal authorities) aimed at raising energy efficiency

of the industrial production. In its turn, it requires investments for the renovation of the existing power engineering equipment as well as for the development of town-forming business and enhancing the municipal economy in general. The authors believe that one of the investment sources can be improvement of the tariff formation mechanisms of the electric power industry with the aim to promote electric power consumption by town-forming enterprises.

7. Conclusion

The study carried out by the authors summarizes the information on the problems of one-industry municipalities of the Russian Federation, that are related to electric power generating capacities. The available statistic data prove that the electric power industry often employs the equipment with the expired service life and the profitability of its production is significantly lower than the average value of profitability of all the Russian industries.

The offered aggregated indicator of engineering and economic stability of electric power plants enabled the authors to make calculations for a number of electric power enterprises located in the one-industry towns included into Russia's List of Monotowns. The results of the evaluation of the engineering and economic stability of the power generating plants in the monotowns indicate an increase in specific fuel equivalent consumption, a decrease of the utilization factor of maximum capacity and insufficient own resources for financing the renovation programs.

At the same time, the authors pay a special attention to the monotowns with electric power plants being town-forming enterprises. This study has proved a lack of investment attractiveness of the power generating plants as well as a rather difficult socioeconomic state in the monotowns of these generating plants.

Consequently, this study has revealed the necessity of comprehensive programs for the renovation of the existing power generation equipment, which should be harmonized with the measures focused on the elimination of the one-industry character of the towns through the growth of medium-sized and small businesses aimed at establishing enterprises of some new for the given town industries as well as at rendering services to local people and raising the investment attractiveness of the regions. The mentioned proposals made by the authors can be implemented under conditions of an appropriate level of the comprehensive governmental and municipal controlling that pursues a better availability and transparency of the information on the economic performances of business companies in one-industry municipalities.

References

- Allen, J. (1966). *Company Town in the American West*, Oklahoma: University of Oklahoma Press.
- Chernov, S., & Filchenkova, M. (2015). Specificity of targeted investment in the energy sector. *Business. Education. Right. Bulletin of the Volgograd Institute of Business*, 3 (32), 105-109.
- Dinius, O., & Vergara, A. (2011). *Company Towns in the Americas: Landscape, Power, and Working-Class Communities*. Georgia: University of Georgia Press.
- Federal Law No.384-Φ3 of December 01, 2014 On the Federal Budget for 2015 and for the period of 2016-2017 (Revision of November 28, 2015).
- Federal Law No.415-Φ3 of December 19, 2016 On the Federal Budget for 2017 and for the period of 2018-2019 (Revision of July 01, 2017).
- Garner, J. (1984). *The Model Company Town*. Amherst. Amherst: The University of Massachusetts Press.

- Gibadullin, A., & Pulyaeva, V. (2016). *Modern mechanisms of innovation development of industry in Russia*. Moscow: State University of Management.
- Green, H. (2011). *The company town: the industrial Edens and satanic mills that shaped the American economy*. New York: NY
- Gureva, O., & Barkhatov, V. (2014). Forecasting of economic of the city-forming enterprise in the monotown. International conference on Eurasian economies. *Skopje-Macedonia, 01-03 June 2014 z. Selahattin Sari, Alp H. Gencer, Ilyas Sozen, 4*, 216-220.
- Hayrynen, S., Turunen, R., & Nyman, J. (2012). *Locality, memory, reconstruction : the cultural challenges and possibilities of former single-industry communities*, Cambridge: Cambridge Scholars.
- Ilyina, I. (2013). Russian one-industry towns development. Moscow: Financial University Publ.
- Kharitonova, E. (2012). Indicators of socially responsible activity of industrial enterprises. *Administrative Sciences, 2*, 48-55.
- Kuznetsov, N. (2014). Financial support of the electric power enterprises of Russia in the conditions of realization of programs of development of branch. *Fundamental Research, 8*(6), 1431-1438.
- Leibenstein, H. (1966). Allocative Efficiency vs. "XEfficiency". *American Economic Association, 56*, 392-415.
- Olshausen, M. (2013) *From Company Town to Company Town*. Washington: Holden and Holden Village., 1937-1980 & Today.
- Russkov, O., & Saradgishvili, S. (2015). The electricity market prices forecast as efficient procedure for an industrial monotown enterprise. *Procedia Engineering, 117*, 309-316.
- Satybaldina, E.V. (2013). Specific character of life of modern urals monotown. *Middle East Journal of Scientific Research, 17*(9), 82-98.
- Sechina, A., Pokrovskaya, N., Fedenkova, A., & Kurlmel, G. (2016). Corporate social responsibility as a tool to insure the well-being of monotowns in Russia. In O. Berestneva, A. Tikhomirov, A. Trufanov (Eds.), *Advances in Computer Science Research: Proceedings of the 2016 Conference on Information Technologies in Science, Management, Social Sphere and Medicine (ITSMSSM 2016)*. SHS Web of Conferences. 28. 01138. <https://dx.doi.org/10.1051/shsconf/20162801138>.
- Winson, A., & Leach, B. (2002). *Contingent Work, Disrupted Lives: Labour and Community in the New Rural Economy*. Toronto: University of Toronto Press.
- Zamyatina, N., & A Pilyasov, A. (2016). Single-Industry Towns of Russia: Lock-In and Drivers of Innovative Search. *Foresight, 10*(3), 53-64.