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COMPETITIVENESS EVALUATION OF COAL ENTERPRISE

Summary. The paper considers the issues of coal enterprises competitiveness assessment of the Russian Federation. Theoretical and methodical aspects of enterprise competition and competitiveness are presented. The review of the methods and indicators used for enterprise competitiveness assessment is given. The recommendations of enterprise competitiveness assessment level are analyzed. The list of indicators of coal enterprise competitiveness assessment is formed. The comparative assessment of competitiveness indicators of JSC "SUEK" and JSC "Kuzbassrazrezugol" is given.

Keywords: coal quality; competitiveness; evaluation of competitiveness; integrated indicator of quality.

ANALIZA KONKURENCJI PRZEDSIĘBIORSTWA GÓRNICZEGO

Streszczenie. W artykule rozważono zagadnienia z zakresu analizy konkurencji przedsiębiorstw węglowych w Federacji Rosyjskiej. Zaprezentowano teoretyczne i metodologiczne aspekty konkurencji przedsiębiorstw oraz konkurencyjności. Dokonano przeglądu metod i wskaźników używanych w analizie konkurencji przedsiębiorstw. Na poziomie analizy konkurencji przedsiębiorstw zostały sformułowane rekomendacje. Utworzono listę wskaźników do analizy konkurencji przedsiębiorstwa górniczego. Analiza porównawcza wskaźników konkurencji została przeprowadzona dla firm „SUEK” i „Kuzbassrazrezugol”.

Słowa kluczowe: jakość węgla, analiza konkurencji, zintegrowany wskaźnik jakości.

1. Introduction

The coal branch of the Russian Federation is characterized by the most provided source of raw materials in comparison with the other branches of fuel and energy complex. In the Russian Federation there are 22 coal-mining fields and 129 separate fields.

According to the long-term program of the Russian coal industry development for the period till 2030 approved by the order of the Russian Federation Government No.1099-r 21.06.2014, one of the requirements for perspective development of the coal industry is transition from "simple" energy resource trade in the external and internal markets to the hi-tech "power product" trade providing (on the basis of deep coal processing) efficiency increase of its final use and reduction of transport expenses for consumer delivery.

For achieving the main objectives of the Program and eliminating threats of the national coal branch development the solution of the following major tasks is provided¹:

- forming new clusters of coal mining providing world level of productivity and quality of coal production;
- improving management of mineral resources;
- forming principals of coal exchange trade including development of price indicators;
- expanding national production of mine machinery, equipment and spare parts;
- forming system of industrial and ecological safety on the world level;
- developing corporate social responsibility and labor relations of the coal companies.

Among the expected results of the Program there is a supply growth of the Russian coal for power industry in domestic market from 69 to 90 million toe per a year within an export share increase of coal production delivery from 38,5% to 43-44%.

It is noted that competitiveness of coal branch, taking into account the features of the last, has to have reflection at six levels:

1. Competitiveness of coal production which is defined by such mutually influencing factors as level of scientific and technical progress, production quality and its price.
2. Competitiveness of the coal enterprise which depends on production efficiency, management efficiency, the production potential and the product range.
3. Competitiveness of the coal company (association).
4. Competitiveness of coal branch.
5. Competitiveness of the coal basin (region).
6. Competitiveness of the country.

Production competitiveness is defined by such factors as price, quality and level of scientific and technical progress. The average production price of enterprise defines price competitive advantages and price level competition in the market. Qualitative production

¹ Yanovskii A.: About the problems, perspectives and tasks of coal industry. Coal, No. 3, 2015, p. 9-11.

characteristics and level of scientific and technical progress determine the non-price competition level.

Besides it there are such types of the competition as subject and functional, generic; specific, trophic and etc.

There is a large number of definitions of enterprise (firm) competitiveness. We consider some of them.

Competitiveness of the company is the ability under certain external conditions to provide (support, increase) competitive advantages in comparison with other organizations operating in this market²

Enterprise competitiveness is comparative efficiency of enterprise operation in the conditions of the particular market or its segment³.

Coal competitiveness is defined as ability of coal production to be allocated by the consumer from the other types of fuel and energy resources offered by rival suppliers due to higher consumer properties and (or) the best technical and economic indicators⁴.

Competitiveness of the coal enterprise is a producer's possibility to offer coal raw materials meeting such consumer's requirements as qualitative characteristics, quantity, the most favorable terms of delivery including the price and execution periods⁵.

In our opinion, competitiveness is such category which definition can't be given in general for goods or enterprise. Competitiveness should be defined for each enterprise and kind of goods separately. In process of market situation change or enterprise tasks for a certain period of time definition of enterprise competitiveness will change.

For example, for power generating coal and coking coals concept of coal competitiveness will differ. If we define concept of coal production competitiveness on the country level in general, a difference for gas and coal prices should be marked in such definition which has to be not less than 1:2 for providing coal competitiveness.

2. Research methodology

The issues of coal branch competition and competitiveness are considered in the research papers of such scientists as Aleshinsky R.E. Davydov M.V., Embulaev V.N., Glinina O.,

² Nevskaya M.A., Ponomarenko T.V., Sultani A.N.: Potash industry enterprises competitiveness potential assessment. Proceedings of the Mining Institute, No. 179, 2008, p. 161-168.

³ Embulaev V.N., Tonkih A.I.: Coal enterprise management development to increase its competitiveness. Dal'nauka, Vladivostok 2010.

⁴ Mesyats M.A.: Enterprise foreign trade activity management (evidence from Kemerovo region coal industry). Kuzbassvuzizdat, Kemerovo 2006, p. 11.

⁵ Mesyats M.A.: Enterprise foreign trade activity management (evidence from Kemerovo region coal industry). Kuzbassvuzizdat, Kemerovo 2006.

Islamov S.R., Kovalchuk A.B., Krasnianskii G.L., Mesyats M.A., Molchanov O.Y., Shafranik Y.K., Tonkih A.I., Yanovskii A.B., Zaidenvarg V.E. and others.

It is necessary to consider in more details the subject and functional competition as fundamental factors of the price and non-price competition. The functional competition is defined as possibility of satisfaction by various goods and services of the same requirement differently. The subject competition takes place only in the case when various enterprises offer consumers almost identical goods. Besides it there is specific competition. It appears when the goods (services) for the same requirement satisfaction differ from each other in the properties influencing on degree of such satisfaction⁶.

In the given definitions there is no accurate distinction between the functional and specific competitions. In our opinion, for competition classification and its type division two criteria can be offered to use: meeting the requirements; consumer properties of goods (services).

In our opinion, the functional competition takes place meeting one requirement can be done by various groups of goods within one class (fuel demand can be satisfied with purchase of gas, coal, fuel oil, firewood).

The specific competition can be defined as possibility of meeting goods requirement of one group but acting in different types (mine coal and a concentrate of coal in briquettes).

The subject competition is the competition between various kinds of one type of goods produced by various companies (the identical coal ranks extracted by different mining companies). This type of the competition can be called branded competition with frames of coal market.

It should be noted that competition can take place between kinds of production produced by one enterprise. Such type of competition can be called the internal competition. In the coal market such type of competition exists when various coal brands have almost the same properties (calorific ability, moisture content, ash-content, etc.). They can be used, for example, for power generation at heating and power plant (coal brands Д and Г).

Besides it analyzing types of competition it should be taken into consideration that there are cases when processed goods obtain ability to meet the requirements at higher level. In particular, it is actual for tendencies of deep coal processing currently (coal beneficiation, gasification, getting liquid fuel from coal). Such type of competition can be called the internal functional competition.

Currently there are some methodical approaches of studying enterprise competitiveness and its level assessment. The methods of enterprise competitiveness assessment are divided in the following groups:

1. Assessment on the basis of the theory of comparative advantages.
2. Assessment on the basis of the theory of firm and branch balance.
3. Assessment on the basis of the effective competition theory.

⁶ Aleksandrov A.K., Kruglik V.M., Nedel'kin A.N., Savchuk O.A.: Competitiveness of the enterprise (firm). INFRA-M, Moscow 2013.

4. Assessment on the basis of the theory of production quality.
5. Matrix methods of assessment.
6. Integrated methods of assessment.

The method of the *theory of comparative advantages* is used for making comparison with enterprise indicator and similar indicator of the rival enterprise for competitiveness assessment. The indicators choice of enterprise assessment is the main task of using this method. Such indicators as profit volume, profitability, sales volume, a market share are the most often used indicators. The method disadvantage is static character of assessment and impossibility of environment changes assessment.

According to the assessment method on the *basis of the theory of firm and branch balance* it is supposed that in the market there is such state at which the producer has no motivation to other state transition. Thus it is necessary to analyze indicators which can be used by the enterprise more effectively than its competitor. Such indicators as interest rates for credits, cost of purchased equipment, salary rates and some others are usually analyzed.

The main disadvantage of this method is impossibility of achieving equilibrium in practice.

The main tool of the competitiveness analysis on the basis of the *method of effective competition* is comparison of enterprise indicators with its competitors and average industry indicators. Such indicators as production and marketing activity efficiency; production activity efficiency; enterprise financial stability are subjects of assessment. The disadvantages of the method are impossibility of enterprise analysis evaluation in general and also assessment of factors dynamics influencing on competitiveness level.

The competitiveness assessment on the basis of *production quality* considers production comparison of the analyzed enterprise with similar production of its competitor. This approach doesn't reflect enterprise competitiveness in general. It is to be used as part of complex competitiveness assessment.

The concept of life cycle allowing to investigate competitiveness in dynamics is the key idea of *matrix methods* of enterprise competitiveness assessment. The most popular methods are BCG-matrix and matrix "General Electric-McKinsey". The disadvantage of the matrix methods is the limited description of enterprise activity by means of two or three factors, simplified presentation of difficult processes.

The *integrated method* of enterprise assessment assumes that enterprise competitiveness can be expressed by the sum (a formula (1)).

$$K = \sum_{i=1}^n K_i W_i \quad (1)$$

where:

K_i – private indicators of separate aspects competitiveness of enterprise activity;

W_i – the weight of separate factors in total amount.

For developing competitiveness assessment methods of mining companies it should be taken into account that there is a number of factors which define methodological features of such assessment. They are the following⁷:

- oligopoly market;
- operation of specific mineral and raw assets;
- extraction (production) of specific production;
- a limited feature set of production quality (in comparison with consumer goods and industrial goods);
- limitation use of marketing instruments;
- specific nature of personnel structure (high requirements for personnel training qualification due to level of work injury and danger);
- lack of technological flexibility;
- irreversibility of investments and high capital intensity;
- institutional factors;
- low significance of brand-name capital.

Specialists of coal industry offer to use the following number of indicators for determination competitiveness level of coal mining company⁸:

1. A share of the exported production in overall production output and sales revenue.
2. An export share of coal company in the total amount of export (production) of the region (country).
3. A range of coal production.
4. Quality production (conformity of qualitative characteristics to the contract parameters).
5. Price
6. Sales volumes.
7. Profit share of export.

The researchers developed algorithm of competitiveness assessment of the export-oriented coal enterprise⁹. According to the offered algorithm of enterprise competitiveness the level is determined by the following indicators:

1. Competitiveness level of coal production (qualitative assessment of coal characteristics and range width).
2. Price level of coal production.
3. Sales volumes in quantitative and value terms.

⁷ Nevskaya M.A., Ponomarenko T.V., Sultani A.N.: Potash industry enterprises competitiveness potential assessment. Proceedings of the Mining Institute, No. 179, 2008, p. 161-168.

⁸ Mesyats M.A.: Enterprise foreign trade activity management (evidence from Kemerovo region coal industry). Kuzbassvuzizdat, Kemerovo 2006.

⁹ Michailov V.V., Mesyats M.A.: Competition as multilevel system of coal enterprise assessment. Vestnik of Kuzbass state technical university, No. 2, 2005.

4. Indicators level of export activity (a share of the exported production in overall production output; an export share of coal company in the total amount of country (region) export).

It is recommended to estimate each indicator in scores (8-10 scores at high level of indicator; 5-7 scores at average level; 1-4 scores at low level). The exception makes price level (1-3 scores for high price; 4-5 scores for average price; 6-10 scores for low price). The general level of enterprise competitiveness is estimated in total score number (high level of 30 scores; average level of 20-29 scores; low level of 19 and less than scores).

However it has not been defined what value of this or that indicator is high, average or low. A number of indicators (in particular, assessment of qualitative coal characteristics) demands not simply assessment of value indicators and their comparison with standard (standards requirements).

It is supposed that the described algorithm assessment is rather subjective and does not give the chance to compare enterprise activity with activity of its competitor.

In our opinion it is necessary to expand the volume of these indicators significantly.

Besides, in our opinion, the level of competitiveness of coal production needs to be counted by means of an integrated indicator of quality.

Integrated indicator of production quality is calculated by the following formulas (2) and (3)¹⁰.

$$I_i = \sum_{j=1}^m I_{ij} \times a_{ij} \quad (2)$$

$$I_{ij} = \frac{q_{ij}}{q_{ij}^0} \quad (3)$$

where

$j = 1, \dots, m$ – characteristics of the i quality indicator;

q_{ij}, q_{ij}^0 – the j value of the i characteristic of quality indicator according to estimated and reference production;

a_{ij} – weighting coefficient of the j characteristic in the i quality indicator.

However it is necessary to notice that the given calculation of I_{ij} indicator is fair in the case if it is necessary that value of this characteristic was closer to the reference value or exceeded it. In the case if the characteristic value has to be less than the reference value or tend to zero, it is necessary to use the following formula (4).

¹⁰ Ponomarenko T.V.: Strategic assessment methodology of mining companies competitiveness. The Polytechnical University publishing house, Saint-Petersburg 2011, p. 49.

$$I_y = \frac{q_{ij}^a}{q_{ij}} \quad (4)$$

For competitiveness calculations by the given formulas it is necessary to define the reference values of indicators of coal competitiveness.

The problem of the integrated indicator analysis of production quality was considered before¹¹.

For enterprise competitiveness assessment it is recommended to use the calculation method of dynamic and operational potential of competitiveness¹².

The operational potential should be determined as the relation of the reporting period indicator of enterprise to the same indicator of the basic period of the same enterprise. The indicator growth rate is determined.

The dynamic potential is defined as the relation of financial year indicator of the enterprise to the same indicator of basic year of its rival enterprise. Indicator growth rate is defined by the comparison with its competitor.

3. Results

The indicators of coal enterprise competitiveness assessment are given in tab. 1.

Table 1

Indicators of coal enterprise competitiveness assessment

Estimation criterion	Competitiveness valuation parameter	Competitiveness indicators	Calculation model	Symbols
Production	Range	Range depth	Amount of coal ranks	-
	Production quality	Integrated quality indicator	$I_i = \sum_{j=1}^m I_y \times a_{ij}$ $I_y = \frac{q_{ij}}{q_{ij}^a}$	$j = 1, \dots, m$ – characteristics of the i quality indicator; q_{ij}, q_{ij}^a – the j value of the i characteristic of quality indicator according to estimated and reference production; a_{ij} – weighting coefficient of the j characteristic in the i quality indicator
	Producibility	A share of processed coal production	$d_o = \frac{Q_o}{Q_t}$	Q_o – volume of processed production for the period; Q_t – total mining volume for the period
	Volume of production	Volume of production	-	-

¹¹ Vasilev Y.: Determination of coal production competitiveness of the Russian Federation. Economic, social and civilization challenges in the age of globalization, No. 81, 2015.

¹² Ponomarenko T.V., Sultani A.N.: Model of evaluation of the mining enterprise's competitiveness' potential. Proceedings of the Mining Institute, No. 184, 2009.

cont. of table 1

Marketing	Sales revenue	Sales revenue	-	Q_s - volume of sales
Sales efficiency	Market share	Market share	$d = \frac{Q_i}{Q_p}$	Q_i - company sales volume; Q_p - coal market capacity
	A share of exported production	Export share of sold production	$d_e = \frac{Q_e}{Q_s}$	Q_e - volume of exported production; Q_s - total volume of sold production.
	Coal enterprise export share	A share of total export volume of region	$d_{er} = \frac{Q_e}{Q_{er}}$	Q_{er} - total export volume of region

Source: Own elaboration.

The presented indicators were added by net profit and product profitability indicators.

Evaluation parameters of operative and dynamic competitiveness are presented in tab. 2, 3.

In general integrated indicator calculation of production quality of JSC "Kuzbassrazrezugol" is made as arithmetic weighted average for coal rank CC mined at Kedrovsky, Bachatsky, Krasnobrodsky open pit mines. Calculation of this indicator for JSC SUEK was performed for coal rank Д and such mines as "Egozovskaya", "Krasnoyarsk", "Taldinskaya-Zapadnaya-1", "Taldinskaya-Zapadnaya-2", "Mine No. 7 located in Kuzbass region. Weighting coefficients of calculations were appropriated for a share of a branch in the total production volume. Integrated indicator values of production quality and weighing coefficients for its calculation have been calculated before¹³.

Table 2

Operative and dynamic competitiveness parameters of JSC "SUEK"

Indicator	2013	2014	Operative competitiveness	Dynamic competitiveness
Production output th.t.	96452	98860	1,02	2,25
Sales volume, mln. RUB	68978	73908	1,07	1,41
Net income, mln. RUB	3536	-12466	-	-
Product profitability, %	5,66	-	-	-
A share of total coal output in the Russia, %	27,39	27,6	1,01	2,16
Range width	5	5	1,00	0,71
Integrated indicator of production quality	1,14	1,14	1,00	0,81
A share of dressed coal in the total output volume, %	29,1	32,5	1,11	0,39
An export production share in output volume, %	40	41,9	1,05	0,71
An export share in total export volume in the Russia, %	27,3	27,2	1,00	1,49

Source: Own elaboration using datas from: Tarazanov I. Results of coal industry work in january-december of 2014 year. 2015. Coal, 3; <http://www.ukport.ru>.

¹³ Vasilev Y.: Determination of coal production competitiveness of the Russian Federation. Economic, social and civilization challenges in the age of globalization, No. 81, 2015.

Table 3

Operative and dynamic competitiveness parameters of JSC "Kuzbassrazrezugol"

Indicator	2013	2014	Operative competitiveness	Dynamic competitiveness
Production output th.t.	43852	43473	0,99	0,45
Sales volume, mln. RUB	52299	58095	1,11	0,84
Net income, mln. RUB	-1688	-10938	-	-
Product profitability, %	-	-	-	-
A share of total coal output in the RF, %	12,8	12,5	0,98	0,45
Range width	7	7	1,00	1,4
Integrated indicator of production quality	1,41	1,41	1,00	1,23
A share of dressed coal in the total output volume, %	82,7	89,1	1,08	3,06
An export production share in output volume, %	58,7	70,2	1,2	1,76
An export share in total export volume in the RF, %	18,2	20,1	1,1	0,74

Source: Own elaboration using datas from: Tarazanov I. Results of coal industry work in january-december of 2014 year. 2015. Coal, 3; <http://www.kru.ru>.

The provided data analysis in tab. 2 and 3 shows that JSC "SUEK" advances JSC "Kuzbassrazrezugol" by the production output volume and a share in the total production output volume. However JSC "Kuzbassrazrezugol" has much higher indicators such as the range width, production quality, a share of dressed coal and an export share than JSC "SUEK". Share growth rates of dressed coal and export are also higher on average in JSC "Kuzbassrazrezugol".

The dynamic competitiveness indicators present mixed evaluation. JSC "SUEK" shows higher rates of production output volume, sales volume, a share in the total output production and the total export. However JSC "Kuzbassrazrezugol" is a leader in such indicators as production quality, a share of dressed coal, an export share in the total production output. Due to the tasks of coal industry it is worthy to note that JSC "Kuzbassrazrezugol" has higher level of dynamic competitiveness in general.

4. Conclusions

According to the provided analysis in the paper it shows that competitiveness is mixed and difficult category especially in application to coal industry of the Russian Federation. The choice of indicators for competitiveness determination is considered to be a serious issue. The ordinary indicators set of production economic activity does not describe enterprise

competitiveness in all details. Specific indicators should be included in the analysis. Such indicators can be different depending on enterprise aims which are actual for the current moment.

Coal dressing, improvement of production quality and coal prices are actual tasks at the moment. Therefore in our opinion these indicators are of major importance for coal enterprise competitiveness assessment.

The most significant issue of coal enterprise competitiveness assessment is to study indicators allowing to estimate value added of enterprise.

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Omówienie

Poprawa konkurencyjności rosyjskiego kompleksu mineralno-zasobowego jest jednym z najbardziej aktualnych zagadnień. Branża węglowa jest jedną z najważniejszych branż paliwowych, a sektor energetyczny w Rosji wszedł aktualnie na nowy poziom rozwoju. Z tego powodu konkurencyjność jest jednym z głównych celów i wyzwań stojących przed przedsiębiorstwami górniczymi w Rosji.

Artykuł jest poświęcony badaniu konkurencyjności rosyjskich przedsiębiorstw węglowych, gdyż jest to kategoria bardzo złożona i wieloaspektowa. Rozważono w nim teoretyczne i metodologiczne aspekty konkurencji i konkurencyjności. Zaprezentowano klasyfikację typów konkurencji na rynku węglowym oraz opisano różne poziomy konkurencyjności. Na rosyjskim rynku zostały przeanalizowane warunki efektywnej konkurencyjności, do czego użyto wskaźników oceny konkurencyjności przedsiębiorstwa wydobywającego węgiel. W analizie wykorzystano także wybrane wskaźniki konkurencyjności w ocenie rosyjskiego przedsiębiorstwa węglowego. W zakończeniu przedstawiono rekomendacje ukierunkowane na poprawę konkurencyjności badanych przedsiębiorstw.