

Development of the Strategic Analysis Methodology for Energy Sales Organizations

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Abstract: We have shown the urgency of strategic analysis methodology development for the energy sales organizations to improve the efficiency of their operation. We have substantiated choice of strategic analysis methods corresponding to the main areas of development (growth of cost, quality, reliability) and especially the functioning of energy sales organizations: an analysis based on a system approach, SWOT-analysis and analysis of organization performance. We have substantiated the use of the analytic hierarchy process to assess the strengths and weaknesses, opportunities and risks and the models developed on the basis of the method for determining a significance of production factors for energy sales activity as well as activities of an energy sales organization based on resource potential. We have proposed to analyze a performance on the basis of the developed system of performance indicators and models for sustainable development of an organization upon its accelerated growth. We have proposed the strategic analysis methodology for energy sales organizations taking into account the main directions of development and peculiarities of its operation based on application of the analytic hierarchy process to evaluate the results obtained in the course of analysis.

Key words: Strategic analysis methodology, energy sales organization, hierarchy analysis method, assessment of energy sales organization functioning, sustainable development

INTRODUCTION

Strategic management is one of the key directions in the activities of the organization to enhance the effectiveness of its functioning. Questions of strategic management are widely represented in the works of foreign researchers (Ansoff, 1979; Porter, 2016; Mintzberg *et al.*, 2013; Peter, 2001; Kotler *et al.*, 2012; Robert *et al.*, 2014). Development of strategic planning in Russia in the twentieth century was carried out for many decades on the basis of 5 year economic development plans. Some deviation from the long-term planning at the macro level in the last decade of the last century was due to changes in the system of socio-economic relations in the country and it was replaced by the regulation of the sphere of management at the level of the law (Federal Law, 2014). The state give special importance to the strategic management of the power industry as reflected in the approved Order of the RF Government “Energy Strategy of Russia for the period up to 2030” (RF Government Decree, 2009). It should be noted that the strategic management of power industry in Russia is carried out for decades since the long-term energy development plan for electrification developed in 1920 under the leadership of G.M. Krzhizhanovskiy with the participation of

>200 scientists and engineers and designed for 10-15 year on the basis of which active development of the power sector and the industry as a whole began in Russia (Melentyev, 1983). Reformation of the electric power industry taking place during the last 20 year changed the organizational, informational and functional structure of the sector what affected the effectiveness of functioning some of its subjects (Platonov, 2009; Russian Federation Government Resolution, 2012) has brought new challenges to the management of energy companies and therefore, new goals, objectives and conditions for implementation of strategic management in the sector at the micro and macro levels. In the last decade changes in approaches to management in energy organizations took place at the macro level as a form of wholesale and retail markets of electric power (capacity) (Russian Federation Government Resolution, 2010, 2012) and introduction of the standards governing the control functions in the activity of enterprises. At the micro level the state did not have an active impact on the strategic planning of the electricity companies regulating their short term functioning (<3 year). Regional tariff services control planning in energy sales, power grid and generation companies within the framework of tariff regulation mainly focused on a period of tariff setting. For Energy Supply

Organizations (ESO) this period is a year and also tariffs for the population and sales premium should be approved. The growth of tariffs for energy companies services in the past 2 decades and low level of competitive environment hold that not all the mechanisms for improvement of effective functioning are involved, therefore of particular importance is elaboration of tools allowing promotion of the effective development of power sector enterprises.

A special role in the functioning of the Russian fuel and energy complex is played by energy sales organizations which sale energy in retail markets and ensure the uninterrupted flow of funds upon payments on the wholesale electricity market which has special significance for the economic security of the electric power industry. Reducing the solvency of energy sales organizations adversely affect the operation of the power system as a whole the result of which may be lack of funds at the generating companies to purchase fuel and materials for the operation of electric grid at grid operators. Therefore, development of strategic analysis methodology for energy sales organizations which are an integral part of the electric power industry being a high-tech sector the operation of which is based on the work of high-risk facilities (nuclear power plants, hydroelectric plants, etc.) and providing with energy the population and enterprises of the country and foreign partners will allow not only to reveal reasons for low level of competitiveness of these organizations but also give the opportunity to carry out a more effective strategic planning and implementation of programs developed on the basis of data obtained as a result of the analysis.

CHOICE OF STRATEGIC ANALYSIS METHODS FOR ENERGY SALES ORGANIZATIONS

The variety of strategic analysis methods presented in the works of Russian scientists: (Zob and Loktionov, 2011; Krymov, 2011; Bazarov, 2007; Andreychikov and Andreychikov, 2014; Ivanov, 2014; Basovskiy, 2013) allows choice to make upon formation of strategic analysis methodology of energy sales organizations the methods which are most relevant for main areas of energy sales organizations development: cost increase, quality, reliability (Kravchenko, 2015 a-c) and features of the functioning of these organizations (Kravchenko, 2014) which include:

- Energy sales organizations which are a subsystem of a targeted open system, electric power industry (sector) and at the same time-an independent economic entity carrying out activities in the wholesale and retail electricity markets

- The effect of government regulation on operation of energy sales organizations
- The effect of socio-economic factors on the functioning of energy sales organizations
- The existence of contradictions in the field of energy sales organizations functioning
- Energy sales organizations operate under conditions of incomplete information
- Priority of information as a production factor and a factor of development of energy sales organizations
- Constraints in the implementation of marketing policy; the need for supply of electric power in the required amount to customers (inability to influence the increase (decrease) in sales (electric power supply); inability to use the policy of cyclical replacement of manufactured goods in relation to the principal activity (Kravchenko, 2014)

The system approach based analysis, SWOT-analysis and analysis of the organization performance should be highlighted among the strategic analysis methods that meet the peculiarities of the functioning of energy sales organizations and directions of organization development. The choice of system analysis as a strategic analysis method for energy sales organizations is caused by features of their functioning that lay in the fact that energy sales organizations are a subsystem of a targeted open system, electric power industry (sector) and upon that the strategic planning of the electric power industry in Russia was based on the system approach (large systems theory) for decades (Melentyev, 1983; Melent'ev, 1982).

SWOT-analysis as part of the strategic analysis of an energy sales organization allows to reflect both features of energy sales organization functioning and the impact of the external environment; it includes an analysis of the environment based on the sector competitive analysis, PEST analysis; internal environment analysis (management review); it based on determination of the strengths and weaknesses of an energy sales organization and consideration of development prospects. Mintzberg stressing the importance of the analysis of strengths and weaknesses has noted that "SWOT underlies in any attempt to formalize a strategy development process" (Kotler *et al.*, 2012).

The need for performance analysis in strategic analysis of energy sales organizations is determined by several factors one of which should be the commercial nature of their operation as well as the role assigned by the state as an integral member of the wholesale and retail electricity markets, i.e., energy sales organizations must strive to increase their competitiveness through improved

operation for this purpose they need tools for analysis and evaluation of performance. Another reason is related to the methodology of strategic energy sales organization management based on management by objectives one of the basic steps of which is performance analysis.

DEVELOPMENT OF STRATEGIC ANALYSIS METHODOLOGY FOR ENERGY SALES ORGANIZATIONS

Of particular importance for development of a methodology for analyzing the functioning of energy sales organizations is the study of the functioning of the electric power industry including at the global level and taking into account trends in the influence of a system approach the results of which are dynamic for the long-term planning and consequently, in various ways affect the development of an energy sales organization. Such a study should be carried out at the stage of analysis of the external environment (macro-environment). The use of the system approach at the stage under consideration of strategic management will allow a set of goals and properties of energy sales organizations to analyze with regard to their stratified representation in order to determine the integrity of the energy sales organizations (as a system) conformity of objectives of energy sales organizations with the objectives of the higher level system (sector) as a subsystem of a targeted system-electric power industry allowing management solutions to draw up for the effective functioning of energy sales organizations and ensuring the integrity of the electric power industry as a system.

Analysis of the features which influence the government regulation taking into account the time and sector issues and the nature of the regulatory effect will allow more clearly to see the prospects of development of energy sales organizations and solutions to potential problems. Features of the functioning of energy sales organizations such as the effect of factors characterized by incomplete information, including socio-economic factors; existence of contradictions in the functioning of energy sales organizations, determine the need for development and use of the economic and mathematical tools in the strategic analysis for assessment of information on the functioning of energy sales organizations under appropriate conditions.

When conducting SWOT analysis, data can be evaluated based on the analytic hierarchy process developed by Thomas Saaty which offers an effective method for constructing measures for things (a measure which does not exist) and their use for decision-making

(Saaty, 1993, 2009). In the process of analysis of an energy sales organization internal environment an analysis of production factors is carried out which significance for power sales activity was proposed to be evaluated on the basis of the developed model (Kravchenko, 2015a-c). The analysis results revealed that information as part of the production factor "capital" takes one of the key places.

As a result of analysis of energy sales organization development factors it was determined that the use of extensive factors which include information is of higher priority than of intense ones. Effect of production and development related factors of an energy sales organization on its activities can be evaluated using the appropriate model presented in (Kravchenko, 2015a-c); upon that it should be noted that the model allows considering both actually carried out and expected in the long term activities what is essential upon developing a strategy.

Assessment of influence on the functioning of energy sales organizations strengths, weaknesses, opportunities and threats through the use of hierarchies analysis methodology allows determination whether things with an energy sales organization would get worse or better with a particular combination of strengths and weaknesses, opportunities and threats. In fact, in the course of analysis specialists can identify much >10 opportunities: it is the maximum number recommended in the model building under the hierarchy analysis methodology. An analysis of threats may also show more threats than the recommended number for evaluation. It is therefore proposed to compare the effect of the strengths and weaknesses of the opportunities and risks for each data set proposed by experts. Analysis of an energy sales organization performance can be implemented on the basis of the developed system of performance indicators:

- Performance dynamics indicator by types of activities (sales activity, provision of information and energy services, other activities) and the functioning of an energy sales organization
- Performance indicator for diversification strategy selection
- Energy sales organizations development index on the basis of the performance dynamics assessment
- Performance growth indicators by types of activity and functioning of the energy sales organization
- Economic security indicator of the energy sales organization (Kravchenko, 2015a-c)

The following models can be used to assess performance of an energy sales organization. The model for assessment of energy sales organizations performance

for sustainable development consists of 3 components: development in a reporting period; sustainable development considered as a comparison of the changes of growth in a reporting period and a prior period; development reliability characterized by an economic security indicator of the energy sales organization (Kravchenko, 2015a-c). The model is as follows:

$$\Delta E_n^{es} \rightarrow \max, \Delta E_n^{inf} \rightarrow \max, \Delta E_n^{fo} \rightarrow \max, \Delta E_n^{act} \rightarrow \max$$

Development in the period under review:

$$\Delta E_n^{es} > 0, \Delta E_n^{inf} > 0, \Delta E_n^{fo} > 0, \Delta E_n^{act} > 0$$

Sustainable development:

$$0 < \Delta E_{n-1}^{es} < \Delta E_n^{es}, 0 < \Delta E_{n-1}^{inf} < \Delta E_n^{inf}$$

$$0 < \Delta E_{n-1}^{fo} < \Delta E_n^{fo}, 0 < \Delta E_{n-1}^{act} < \Delta E_n^{act}$$

Development reliability:

$$\Delta E_n^{sec} \leq \theta \left(\sum_{j=1}^m \frac{W_j}{m} \right)$$

Where:

- ΔE_n^{es} = An indicator of performance dynamics upon realization of energy sales activity
- ΔE_n^{inf} = An indicator of performance dynamics upon provision of information and energy services
- ΔE_n^{fo} = An indicator of performance dynamics of an energy distribution organization
- ΔE_n^{act} = An indicator of performance dynamics upon realization of other activities
- ΔE_n^{sec} = An indicator of economic security of an energy sales organization
- W_j = The amount of delivered (sold) electricity to consumers for the j-year by an energy sales organization
- kWh = The θ -share of the electricity amount supplied to customers reflecting the value of bad debts
- m = The period for which the average value is calculated for the electricity supplied (sold) but not paid for years; the indices n
- n-1 = Mean respectively, the period under review and the preceding one

Meeting all 3 conditions in the above model that describe development, sustainability and the reliability of development indicates the effective functioning of the energy sales organization. The model to assess performance of an energy sales organization with accelerated growth of the organization is as follows:

$$\Delta E_n^{es} \rightarrow \max, \Delta E_n^{inf} \rightarrow \max, \Delta E_n^{fo} \rightarrow \max, \Delta E_n^{act} \rightarrow \max$$

Development in the period under review:

$$\Delta E_n^{es} > 0, \Delta E_n^{inf} > 0, \Delta E_n^{fo} > 0, \Delta E_n^{act} > 0$$

Accelerated growth:

$$0 < \Delta E_{n-1}^{es} < \Delta E_n^{es}, 0 < \Delta E_{n-1}^{inf} < \Delta E_n^{inf}$$

$$0 < \Delta E_{n-1}^{fo} < \Delta E_n^{fo}, 0 < \Delta E_{n-1}^{act} < \Delta E_n^{act}$$

Reliability of development:

$$\Delta E_n^{sec} \leq \theta \left(\sum_{j=1}^m \frac{W_j}{m} \right)$$

The model to assess performance of an energy sales organization for sustainable development can be applied at various stages of strategic management including for the current planning. This model can be used both for evaluation of performance for sustainable development and to determine the parameters of functioning on the basis of the set performance values (Kravchenko, 2015a-c).

STRATEGIC ANALYSIS METHODOLOGY FOR ENERGY SALES ORGANIZATIONS

Strategic analysis methodology for energy sales organizations includes the following stages: a system approach based analysis, SWOT-analysis and evaluation of energy sales organization performance on the basis of a performance indicators and models system.

Analysis based on a system approach involves applying targeted and informational approaches as a result of which stratification of objectives and properties of an energy sales organization should be performed integrity of the energy sales organization (as a system) consistency of objectives of the energy sales organization with objectives of a higher level system (sector) as part of a targeted system, i.e., electric power industry allowing make management solutions for the effective functioning of the energy sales organization and ensure the integrity of the electric power industry as a system should be determined.

In the course of implementation of the SWOT-analysis within the framework of environment analysis a development trend analysis of electric power industry systems at the present stage on the basis of a system approach analysis of the competitive

environment; analysis of micro and macro environment; analysis of influence of government regulation on the operation of energy sales organizations should be carried out taking into account the temporal and sectoral aspects. Analysis of the internal environment of an energy sales organization includes: an analysis of a value chain for main and additional activities; analysis of strengths, weaknesses, opportunities and risks and their assessment based on the analytic hierarchy process; analysis of production factors based on a model for determining the significance of the production factors for energy sales activity; analysis of development factors of an energy sales organization, evaluation of influence of production factors and development factors on the activities of an energy sales organization based on the model for determining the activities of an energy sales organization on the ground of the resource potential. Analysis of performance of an energy sales organization is based on a system of performance indicators: indicator of performance dynamics of the activities (sales activity, provision of information and energy services, other activities) and the functioning of an energy sales organization; performance indicator for a diversification strategy choice; indicator of the energy sales organization development on the basis of performance dynamics assessment; performance growth indicators by types of activity and functioning of the energy sales organization; indicator of economic security of an energy sales organization.

CONCLUSION

Strategic planning in the Russian power sector was formed on the basis of a system approach for >70 year which is a serious basis for the design of strategies for energy companies, including energy sales organizations, at present and in the future. Development of strategic analysis methods for energy sales organizations, including major elements: system analysis, SWOT analysis, performance analysis is caused by the peculiarities of the functioning of these organizations and formation of market relations between the subjects of electric power industry. The proposed strategic analysis methodology for energy sales organizations takes into account peculiarities of the functioning of energy sales organizations and the main directions of their development based on application of system approach, including targeted and information approaches, SWOT-analysis, comprises analysis of internal and external environments using the analytic hierarchy process to assess the strengths and weaknesses, performance capabilities and risks of energy sales organizations and the models developed on the basis of

this method allowing determination of the importance of production factors, influence of production factors and development factors on the activities of energy sales organizations as well as analysis of performance of an energy sales organization on the basis of the system of indicators and models developed. Models for assessment of energy supply organizations performance for their sustainable development and at their accelerated growth can be applied at various stages of strategic management, including for the current planning.

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