

Innovation Strategy of Corporate Energy-Saving Systems as an Element of Innovation

¹Vladimir Leonidovich Kurbatov, ¹Svetlana Mikhailovna Naumova and ²Irina Anatolyevna Kuznetsova

¹North-Caucasian Branch of Belgorod State Technological University,

V.G. Shukhov 357202 Stavropol Territory, Mineral Water Ul. Zheleznovodsk 24

²Belgorod Shukhov State Technological University, Russia, 308012, Belgorod, Kostyukova Street, 46

Submitted: Aug 15, 2013; **Accepted:** Sep 11, 2013; **Published:** Sep 18, 2013

Abstract: The article considers the issues of innovation strategy of the corporate system of energy (CSE) saving, as basic elements of innovation. In accordance with the methodological principles of strategic management, presented features of the proposed strategy. Studied organizational issues of formation of innovative strategy and its implementation.

Key words: Innovation · Systematic approach · Innovation strategy · Systemology · Principles of strategic management

INTRODUCTION

Each innovation strategy CSE is taken by the supreme leadership of the corporation direction or ways of innovative activity connected with saving of energy, to achieve important results, creating long-term effects. The formation of the innovation strategy is vital in cases where there are sudden changes in the external environment of the corporation.

In accordance with the methodological principles of strategic management strategy differs from the plan in that it is developed in an uncertain environment. In these conditions, the main goal of the CSE and its main components and local objectives (LO) cannot be determined with reasonable for the practice of certainty and cannot work out a specific job (criterion management CM) for the CSE as divisions of the corporation. Therefore, the innovation strategy, you cannot form a pair (LO, CM) in which to achieve each individual objective is determined, the corresponding task. Specific innovation strategy is one of the strategies of a number of alternative.

Targeting each developed a specific strategy of the corporation determined approximate representation of specific management objectives - a guide management (Gm), which is refined in the process of development and implementation of the strategy, gradually approaching towards a particular goal. Each line control is mapped to a strategy, which is the means for achieving this goal. Thus is formed the pair (Gm, Strategy), the same pair (LO, CM).

Mission of the corporation may be divided into a number of Gm several levels, forming tree landmarks control, similar to the tree of objectives. To select the appropriate mission of the innovation strategy CSE is necessary for each target to match specific innovative strategy of a certain level, the aggregate of which forms the tree of innovation strategies (Figure 1).

The Main Part: Innovation strategy CSE - strategy, aimed at solving innovative problems. It corresponds to the first level of decomposition of the mission of the corporation and is linked to other strategies. Accepted for execution of innovative strategy of CSE is a system of private strategies, as it can be concertized and then and differentiated by different parameters of innovative activity (the second and third levels of decomposition). Innovative strategies certain level serve as targets for strategies subsequent levels.

Thus, innovation strategy is a systematic approach to solving innovative problems of development and functioning of the CSE as an open social-technical systems supporting balancing its activities and identify the part of the corporation's main strategic objectives and directions of its development. It integrates the main objectives of the development of the CSE, its innovation policy and the sequence of the major steps in the innovation sphere (or programs) in a coherent whole. Correctly formulated innovation strategy enables you to organize and distribute always to some extent limited resources extremely effective and the only true way on the

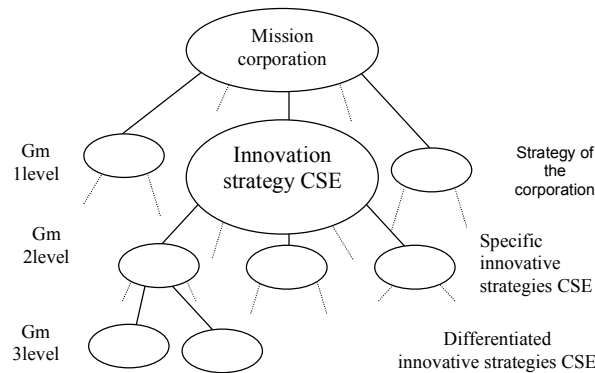


Fig. 1: Mutual conformity of the landmarks management strategies corporation and innovative strategies CSE

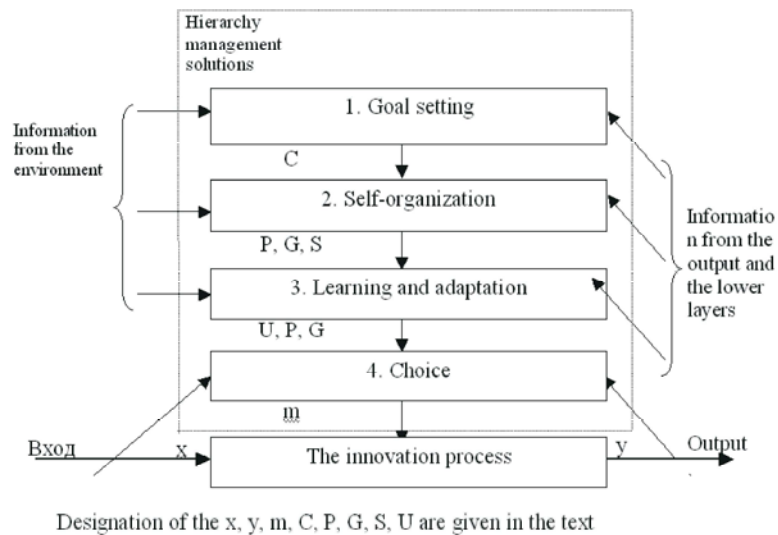


Fig. 2: Functional multi-layer hierarchy management decisions

basis of the internal competence, foreseeing changes in the external environment and the consideration of possible counteractions opponents [1, 2].

Because strategies define the general lines of action of the CSE, they cannot be considered as simply building programs under the pre-set goals. Strategic decisions determine the general directions of innovative development of the CSE and its viable in the face of predictable, unpredictable and unknown at the moment of events that may occur in its meaningful environment. They outline the real objectives of the CSE, help to define the limits within which unfolds its innovative activity, prescribe the types and amount of attracted for the decision of problems of resources and principled sequence of conduct.

In order to explain how the accepted strategic management decisions and formed a tree innovative strategies, we introduce the notion of functional hierarchy of administrative decisions [3].

Previously it was shown that the CSE in the categories innovation is adjustable and self-organizing system, capable of transforming the external environment in the interests of our own sustenance. Therefore, describing the functional hierarchy of administrative decisions in the language of set-theoretic approach and proceeding from the fact that innovative development goals CSE already specified (and their undoubted truth), it is legitimate to limit this hierarchy only three layers: 2 - self-organization; 3 - training and adaptation; 4 - the choice (Figure 2).

Figure 10 functional hierarchy of administrative decisions is considered relative to the standard view of some of the innovation process (input - process - output), which is regarded here as the process of changes in techniques, technology or any other elements to the CSE, leading to a progressive change in the general character of its activity. In other words, the innovation process is the implementation of innovations in any element of organizational system of the CSE.

Layer Selection: Task - select the way of action. The deciding element on this layer receives external information and, using the algorithm defined by the upper, finds the correct way of doing it.

The algorithm can be defined as a functional mapping (T), giving a solution for any valid for this layer a set of initial data. Choice of activity (m) based on the application of the evaluation function (G) the output function (P). In the language of set-theoretic approach to the theory of systems of the output function can be defined as a mapping:

$$P : M \times U \rightarrow Y \quad (1)$$

where M - set of alternative actions; Y - set of possible output; U - many uncertainties that adequately reflects the lack of knowledge about the relationship between the action (m) and exit (y).

Similarly, the evaluation function G is a map:

$$G : M \times Y \rightarrow V \quad (2)$$

where V - a lot of values that can be associated with the quality characteristics of the system.

If (U) consists of a single element or is empty, i.e. relative to the output for a given action (m) no uncertainty, the choice can be based on optimization: to find that (m') in (M), value $v' = G(m'; P(m'))$ was less than $v = G(m; P(m))$ any other activity $m \in M$. If (U) - more than the rich variety, have to offer other procedures for the selection of the appropriate actions. In any case, in order to define a problem of a choice on the first layer, you must specify the many uncertainties (U), required ratios (P), (G) and so on. This is done on the elements of the upper layers.

Layer Learning or Adaptation: The task of this layer is a specification (narrowing) of many uncertainties (U) for usability layer selection. Many (U) does not really exist and the estimated system solutions, that is, carried it uncertainties, which include all the ignorance about the behavior of the system and reflecting all the hypotheses about the possible sources and types of such uncertainties. Many (U) are obtained by observations and external sources of information. If the system and the environment are stationary (i.e. change and the nature of changes statistically known), then the set of uncertainty may be very narrowly (to the single element). Layer learning if necessary, it can completely change (U), thereby initially allowing injustice some basic hypotheses.

A Layer of Self-Organization: Here you choose the structure, functions and strategies used then the underlying layers so, in order to get closer to the global target (normally defined in terms that are difficult to make operational). If the overall goal is not achieved, this layer can change the functions of (P) and (G) in the layer, selection or training strategy (S) in the layer of training in the case of unsatisfactory evaluation of uncertainty.

Layer goal-setting is required in connection with the discussion of problems of formation of innovative strategy of energy-saving systems corporation. The issue of setting goals becomes even more important due to the increasing dynamics, turbulence environment. Thus, information provided by the functional hierarchy solutions must extend at the expense of another layer - the layer of goal setting (layer 1 Figure 2). The task of this layer is to subject to critical analysis and make the global objectives of the CSE (C). To determine the global goals of the system it is necessary to establish metacriteria their «correct». System theory permits the formation of metacriteria both within the system and outside of it.

The establishment of such a criterion, on the one hand, is a political question which already broken a lot of copies and the decision of which, apparently, in absolute terms, it is essentially impossible. On the other hand, this problem is directly linked to what we are discussing here the question of the innovation strategy of the CSE.

Thus, the first aspect of the concept of «innovation strategy of energy-saving systems corporation» is connected with the fact that this ideology or philosophy of doing business, based on the principle of conscious search for balance of interests all participants of market exchange, including indirect public and group interests. The philosophy of the strategy of innovative development of the CSE is connected with the recognition of the fact that the consumer is an equal partner, a subject, but not as a passive object for a profit. Strategic management on this basis means the voluntary acceptance of social and environmental responsibility.

But the notion of «innovation strategy of energy-saving systems corporation» is not exhausted. Functional hierarchy of decisions (Figure 2) allows you to illustrate its other features. For this theoretical model of the hierarchy of administrative decisions necessary to bring the mind, having more practical orientation (Figure 3).

Operational management layer represents choice and part of the layer of learning and adaptation of the original theoretical model. The general character of operative management the current management of functioning of

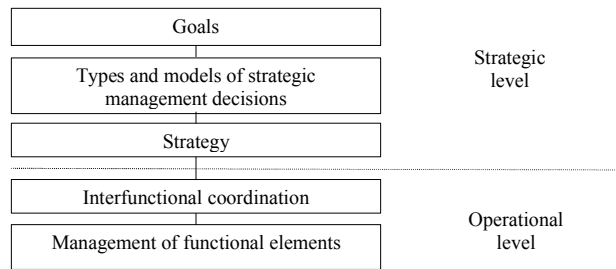


Fig. 3: Practical hierarchy of administrative decisions

the existing system on the basis of the set targets in terms of stationary environment. The main solutions are becoming decisions associated with the functioning of the elements of the selected model of the system of departments on the specified rules and interfunctional coordination in respect of resources (material, time, human and other) [3].

Among the corporation's staff and CSE often observed following your own traditions and values developed as a result of professional activity and execution of specialized tasks. This is at odds with the general orientations of innovative energy-saving strategies. Therefore, interfunctional coordination can be achieved through the exchange of information, coordination of actions at the basis of organizational documents and special organizational procedures [4].

Thus, at the operational level, the essence of managerial decisions in the framework of the innovation strategy of energy-saving systems corporation is to ensure a balance in the event of any changes in the object, subject and process management and other qualitative level of development. This uses a special set of interrelated economic instruments, with help which probably to solve quickly the tasks in achieving the stated objectives.

Tasks of the two upper layers and largely the third layer is inherent to the strategic level of management. The general character of strategic management - orientation of the system in the environment and managing change (restructuring) of the system. Management decisions in this case are associated with the establishment of the system goals, choice (modification) principal model of management system and development strategy, that is, rules of functioning of the elements of the selected model of the control system [5].

Let us consider in more detail the ratio of the concept of "innovation strategy of energy-saving systems corporation" with these two levels.

Speaking about management of functional elements, you must contact the study of such categories as the

structure, elements and functions, for functional hierarchy of decisions is projected in management, in the totality of their functions. Then the functional hierarchy of decisions is revealed through three main components: the object, the subject and the management process.

Let $F_c = (f_1, \dots, f_n)$ - system of functions of management of the economic entity (CSE), where $f(i = 1, 2, \dots, n)$ a private sign allocation management functions. Then all private signs allocation functions are divided into three groups on integrated structure-forming characteristics:

O - a sign of integrating many private signs that reflect the structure of the control object (or object of application of forces);

S - same, but reflecting the structure of the subject of management;

R - reflecting the structure of the management process and:

$$F_c = (f_1, \dots, f_n) = (O, S, P)$$

Further decomposition (or disclosure patterns) management functions belonging sets O, S, P within allocated structural characteristics leads to the picture presented in Figure 4.

Numerous control functions, reflecting the structure of the control object (O), consistently is decomposed into:

- The scope of activities (o_i, o_j) that may be allocated to further the areas of functional activity (Table 1). Spheres of activity are classified into levels, actors in the management and individual employees;
- Management tasks (o_k), which can dismember a separate sphere of activity on a number of specific management problems, solutions of which are necessary for the implementation of these areas of activity;
- Technological operations management (ξ_i), consisting of logic, computing, technical actions operational level.

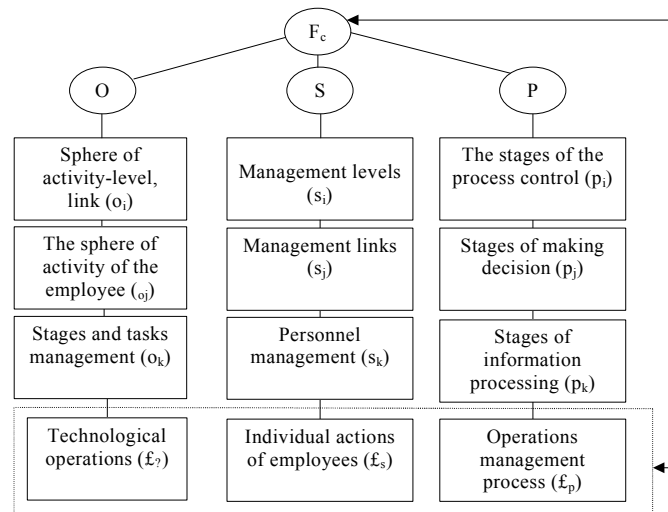


Fig. 4: Management functions in accordance with the characteristics of object, subject, and process management

Table 1: The key strategic area of activities of the CSE

No	Strategic area of activity	Main activities of the CSE
1	Innovative development	Improvement of technological and production-technical base in accordance with the achievements of science, technology and production, to ensure timely diversification, stability, performance of the CSE and the competitiveness of its products
2	Formation and use of resources	Increasing the intensity and balanced use of all resources, improving and maintaining their quality level, reduction in their relative volumes and improvement of the efficiency of use of resources and qualified potential of the personnel.
3	Environmental (external environment). Environmental protection	Implementation of the CSE norms and requirements to the impact of production processes and products on the environment, rational use of natural resources, their restoration and reproduction
4	Organizational management	Raising the level of the corporation's production and management corporation CSE
5	Stimulation and motivation of labour	Improving the employee's social protection, accounting value orientations personnel (theoretical, economic, political, social, aesthetic, religious), increase of a degree of satisfaction of labor by its stimulation and motivation, improvement of working conditions, life and rest, activation the human factor
6	Improvement of production quality	Ensuring compliance with the technical, aesthetic level, quality of developed and manufactured products to the requirements of users
7	Manufacture and implementation products	Creating real plans rhythmical production and realization of manufactured production quality, volume, nomenclature and assortment in time and with the best production cycle

Structure of the set of functions of management, reflecting the views of management subject (S) can be represented as consisting of levels, units and individual employees (s_i, s_j, s_k), i.e. repeating the detailed organizational chart control. Completes this decomposition operating level - individual actions of employees ($£_8$).

Management functions, reflecting the structure of a process control (P), share, respectively on:

- Stages process control (p_i), i.e. planning, organization, control, accounting, analysis, regulation;
- Stages of decision making (p_j);
- Stages of processing of the information (p_k);
- Operations management process ($£_9$).

At the operational level ($£$) managerial work is indivisible whole object, a subject and process control (F_c).

Model of managerial work (Figure 4) allows a better view of the interpenetration of the management functions allocated to the main structure-forming characteristics and also clarifies the issue of emergence of new and disappearance of unnecessary control functions. Indeed, the external environment determines the mission and main goals of development, i.e. the scope of activities (i). Spheres of activity determined by the structure of the management and distribution of labour by artist: levels, employees, workers (j). Performers of any level clarify their activities, their target characteristics and only after that the share management work on the stages and tasks of process control (k) and then and operations ($£$).

This dynamic process is filled with constant decomposition of administrative work and system coordination of its members at all levels.

The strategic level of management decisions is the basic methodology of the innovation strategy of the CSE. It creates a basis for defining the mission and the formulation of strategic objectives of energy saving, determines the main vector, the necessary degree of strategic efforts of the corporation for their implementation. The most problematic are the issues of goal-setting and select a few key concepts and key strategic areas of activities of the CSE, which gives innovative strategies consistency, balance and focus [6].

There is another aspect to be considered in greater detail, is the organizational aspect of the innovation strategy of energy-saving systems corporation. Indeed, the functional hierarchy, shown in Figures 10-12, is based on a conceptual coverage of the system-wide characteristics of essential functions in the complex system of decision-making. In practice function at any level should be selected in such a way that it can be implemented with a subsequent decomposition. Decomposition means the appearance of controls and definition of the structure, i.e. the elements of the relationship between themselves [7].

Organizational issues of formation of innovative strategy and its implementation are independent and sufficiently relevant. The original basis for the study of organizational issues may still be a systematic approach. It defines the meaning of existence of system power management as a desire artificial system to an equilibrium, natural systems. Internal balance CSE ensures organizational concept, which refers to the regulations under which the relationships inside the corporation, technology process control, as well as a system of assessment of the performance indicators, criteria and methods of their assessment and other External balance the CSE is achieved innovation strategy (Figure 5) [8].

Summary: Elaboration and adoption of the organization of strategic innovative solutions in the field of energy saving should be based on environmental information system (Figure 5). For CSE especially important creation of the infrastructure of environmentally relevant data. This is because the data on the pollution of natural environment of scarce resources, etc. are important to the corporation at least give them the values of the society. And this process is hardly predictable. If this or that environmental information is relevant, it must be transformed into economic value. Moreover, this

information may be in the form of weak signals. The existing accounting system, primarily focused on the past and presented in terms of cash value, unable to recognize these weak signals. And this is the situation, in contrast to the market oriented planning that can be limited to data of the market. Environmental information is often detected and processed by the representatives of the foreign corporation for environment. Therefore, information about the external (in the broad sense) environment, including political, represents for the CSE particular importance.

In a number of specific methods of analysis of the external environment, received application lately, includes “the system for early recognition” [9]. Related to these systems are weak signals can occur anywhere, for example, due to the emergence of many homogeneous environmentally relevant event, the dissemination of new knowledge, etc. For their detection organization can transmit suppliers, logistics enterprises and trade organizations trend-forms (checklists).

Another technique of this set of methods for the analysis of the external environment is “dispersion curve”. There are the typical way of dissemination of ideas of perception of problems, processes, decisions that follow non-linear trends (s-shaped curves). First noted the slow process of collecting information, then it is an avalanche-like increase, then the flow of information is kept at a high level, for the resolution of interest to the information weakens.

With regard to environmental information, the increasing amount of information of this kind is getting into the centre of public attention, that may be the symptom of the beginning of the diffusion process. For individual organizations analysis of such information is fraught with well-known difficulties. In this area, preferable to the activities of the branch or of other business associations. If a Corporation is conducting a passive environmental policy will likely wait for a reply from the state, corporations with an active environmental policy will take preventive measures, realizing the danger of escalation of public attention and the intensification of the debate. With the increasing tension, when the company “gathering environmental clouds” to ease the heat of the passions, is enough (as first steps) give a credible explanation and simply signaling of stake-holders about their readiness for cooperation and dialogue [10].

Following the analysis of the internal and external environment made the transition to the development of an environmental strategy. Its development is a vital function of strategic environmental management.

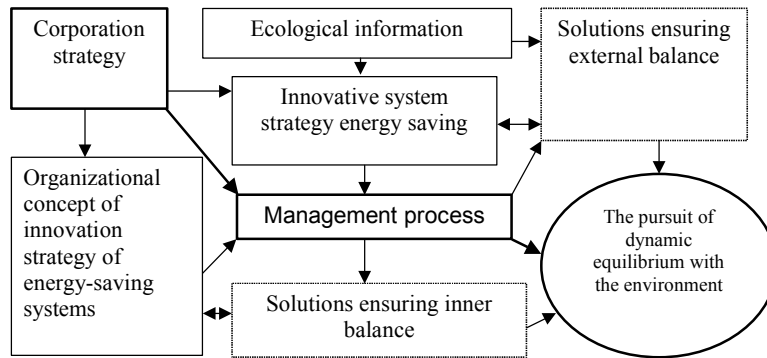


Fig. 5: Components of the innovative strategy of energy-saving systems corporation and their interrelation

CONCLUSIONS

Strategic environmental management aims to identify potentials of the ecological character for success company (advantages in the field of environmental protection, resource saving, environmental safety, in competition with other enterprises), as well as connected with his activities environmental risks, identify on this basis the long-term objectives of the company and to ensure their implementation through the use of a sound system of measures and instruments. In this perspective, it becomes an integral part of the innovation to the CSE.

REFERENCES

1. Doroshenko, Y.A., 2012. Modeling of innovation performance / Y. A. Doroshenko, I. V. Somina // Social-humanitarian Knowledge, 8: 172-177.
2. Doroshenko, Y.A., 2012. Formatting of the objective functions of effectiveness the effectiveness of the system of investment activity / Y.A. Doroshenko, S.N. Glagolev, K.S. Bykov // Application of New Technologies in Management (ANTiM 2012): 3Rd International Conference, Belgrad: Serbia, 19-21 April 2012 ã. / ALFA University, Belgrade, Faculty for Education of the Executives, Novi Sad (Serbia). Beograd: Centar za educaciju rukovodeæih kadrova i konsalting (CERK), 1: 230-233.
3. Johnson Gerry and Scholes Kevan, 1998. Exploring corporate strategy. Published by Prentice-Hall International. New York, pp: 332.
4. Minberg G., B. Alstrend and D. Lempel, 2000. School strategies: Per. from English. - St.Petersburg: Publishing house «Piter», pp: 336.
5. Reznichenko, A.A., 2012. Approaches to ensure effective innovation development Corporation / A.A. Reznichenko, M. S. Starikova, S. M. Mikalyt // Innovative Bulletin of the Region, 3: 81-86.
6. William L. Miller, 1999. Langdon Morris 4th Generation R & D. Managing Knowledge, Technology and Innovation. John Wiley & Sons, Inc.
7. Kurbatov, S.V., 2010. Resource of business assets and sources of their financing and the development of innovative and investment approaches his assurance / Kurbatova S.V. // Actual problems of economic development: Sb. Dokl. INTL. scien. practical. Conf., Belgorod, 2010 / BSTU - Belgorod: Publishing house of the BSTU, 1 O'clock, pp: 350-356.
8. Naumenko, S.M., 2006. Conceptual approaches to formation of strategy of energy saving organizations of a building complex.//Monthly journal «Modern aspects of the economy» '19(102) Saint-Petersburg, pp: 62-66.
9. Robertson Paul L. and N. Langlois Richard, 1994. Institutions, inertia and changing industrial leadership. Industrial and Corporate Change, 3(2): 359-378.
10. Ivanov, V.N., D.B. Melnikov and N.S. Melnikova, 2004. Social innovation in management: questions and answers, structural and logical schemes / M: Municipal Peace, pp: 288.