

ISTRAŽIVANJE EFEKATA RAZVOJA I PROIZVODNJE ENERGETSKIH SISTEMA NA BAZI INTEGRISANOG ZNANJA

RESEARCH OF THE EFFECTS OF DEVELOPMENT AND PRODUCTION OF ENERGY SYSTEMS ON THE BASIS OF INTEGRATED KNOWLEDGE

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Državna zajednica koja želi da se razvija i da ima rast performansi privrednog sistema mora razvijati i proizvoditi energetske sisteme na bazi domaćeg znanja. To je jedini način da se stvore uslovi za zapošljavanje visokoobrazovanih kadrova i zaustavi njihov odlazak u razvijene zemlje. Ako se prednji koncept razvoja koristi na geografskom prostoru koji posjeduje prirodne energetske resurse, onda se stvara ogromni sinergetski efekat mjereno znatno većim stopama rasta ekonomskih i tehnoloških parametara. Energija proizvedena na bazi domaćih tehnoloških i upravljačkih znanja imala bi znatno nižu cijenu koštanja nego energija proizvedena na bazi opreme iz uvoza. Na taj način se lančano stvaraju uslovi za veću konkurentnost svih domaćih proizvoda i usluga. Istovremeno se stvaraju uslovi za rast standarda stanovništva, jer energija zauzima znatan udio u strukturi potrošnje.

Ključne reči: energetske sisteme; znanje; tehnologija; zapošljavanje

The state community that wants to develop and have the growth of the performance of the economic system must develop and produce energy systems based on domestic knowledge. This is the only way to create conditions for employing highly educated personnel and stop their departure to developed countries. If the front concept of development is used in a geographical area that has natural energy resources, then a huge synergetic effect is created, measured by significantly higher rates of growth of economic and technological parameters. Energy produced on the basis of domestic technological and management know-how would have a significantly lower cost price than energy produced on the basis of imported equipment. In this way, the conditions for greater competitiveness of all domestic products and services are created. At the same time, conditions for the growth of population standards are created, because energy takes a significant share in the structure of consumption.

Key words: energy systems; knowledge; technology; employment

1 Introduction

In the conditions of global change, with the emergence of modern information systems, the significance of energy is not diminished, energy has gained a much more important role not only from the aspect of energy consumption growth for the purpose of satisfying human needs, but also from the aspect of the key basic development resource of the economy of each community and the whole planet. In such a situation, the development goal of each state community, which responsibly manages its socio-economic development, must have the necessary amount of energy primarily for the needs of the citizens and the economic system. Countries that have naturally renewable energy potentials must first put the maximum possible energy potential in place, while respecting certain limitations. Today, as the key constraints on activating the maximum natural energy potential, two extremely insurmountable constraints are created. The first is the lack of necessary knowledge in the structures that decide and create operational development flows in the field of energy. The second limitation is that general interests are subordinate to the interests of individuals. The result of energy management in these circumstances is that the energy system is managed extremely inefficiently. This problem is primarily reflected in the poor and underdeveloped countries.

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The question arises as to whether the inefficient management of the energy sector in poor countries that have natural energy potentials must be created according to a global model (developed model) or it is possible to design an optimal model of integral management from the aspect of the optimal value or benefit of the country concerned. The paper deals with the problem of researching the effects of development and production of energy systems in countries that have natural energy potentials, using integrated multidisciplinary knowledge. The field of scientific observation is the poor countries of the former Yugoslavia that have a high level of renewable natural energy potentials. The first aim of the paper is to show that a model of energy system management and processes based on domestic knowledge can be created. Domestic knowledge should be incorporated into the development and production of equipment that would be used for the construction of new energy units for the production of electricity and heat. The second goal of the paper is to show that the implementation of the system model of integrated energy system development in the Republic of Serbia and the Republic of Srpska would be of exceptional economic and social benefit. The third goal is to familiarize the scientific, professional, management and the general public with the results of the research. On the basis of these goals, appropriate hypotheses are given in the fourth part of the paper. In this part of the paper, a shorter synthesis of survey results is provided without specific data due to limited workload.

2 Knowledge of the base for energy management

2.1 General about knowledge

In the twenty-first century in developed countries, knowledge becomes the dominant part of the economy, that is, business in all segments of human activity. Knowledge is a key factor of success and competitiveness in the market. On the basis of knowledge, today the fastest growing knowledge economy is developing. Knowledge, organizations and individuals who come first to him bring great economic and social benefits. When it comes to applied, that is, technological knowledge, this knowledge brings a great economic value in the first phase. Developed countries have developed effective management systems not only with scientific knowledge, but primarily with applied knowledge. Effectively, it is managed not only by technological but also by managerial knowledge. Management-applied knowledge has a proactive character and they are designed in the long run by applying various methods of systemic excellence. Such knowledge, under the known knowledge economy, exports developed countries most often to underdeveloped and poor countries around the world.

Undeveloped countries are increasingly lagging behind because of the lack of an adequate knowledge management system. Technological development is the basis of general economic and social development. Undeveloped countries most often carry knowledge transfer from developed countries according to the instructions of various intermediaries from developed countries and intermediaries from underdeveloped countries. Mediators from those who develop knowledge transfer are the most common development and marketing experts, while mediators from poor countries are often university teachers who do not have practical, but only theoretical knowledge. Such technology transfer of knowledge into underdeveloped and poor spaces is dominant in the field of applied knowledge. These skills are in function of the projected value system of developed countries for the needs of the underdeveloped. This approach of transferring knowledge to the poor countries is not a creative and proactive character, but an adaptive mechanism. Such a mechanism of knowledge transfer synergistically helps financial capital through various mechanisms of care for underdeveloped and under the control of developed countries.

2.2 Multidisciplinary knowledge and energy management

Today we have a constant growth in the dynamics and intensity of changes in all systems and processes. Changes are all around us, from technology, technology, economics, education, security, ecology, medicine, politics and all other phenomena. All these changes are part of a single global system in all of the above and non-mentioned segments. Changes in one segment cause changes in other segments and are all in a lot of interaction with each other. To be able to manage such com-

plex situations, people must have multidisciplinary knowledge. Under the influence of the environment and the existing knowledge, each system is subject to change. To be effective within the limits of the possible management of change and knowledge, it must change. Older knowledge is being replaced by new ones. In order for this to happen, people who are involved in development and knowledge transfer must constantly learn.

One of the most frequently used indicators of the ability or efficiency of an energy system for the production of electricity is certainly the profit of the corporation that manages the energy system. The basic characteristic of this development approach is to discard all technological and other values based on traditional knowledge and traditional mechanisms and tools, or traditional technology. The one who projects such a model of development for the poor does not do it to help the poor, but to put the poor in dependence on the rich. There is a famous saying in our people that says: "If you want a neighbor in a business never to come, he constantly tells him to do the same thing you do." While the neighbors draw the existing knowledge, one who already mastered this knowledge, will in the meantime improve and develop and acquire new more effective knowledge. It follows the clear conclusion that in the essence of sales there is already obsolete knowledge (technology) under the name of modern. On the other hand, the one who accepts offered technologies has practically renounced his technology and his knowledge, and in which he had satisfactory results. It is clear that this model has not reduced the efficiency between the rich and the poor, that is, modern and traditional, but there has been an increase in the development gap both by absolute and relative indicators.

It is very important to understand that knowledge is a very dynamic process. Both technological and managerial knowledge evolve as all processes. At the same time, value systems are changing. There are general value systems that are valid in general, but they are also variable in shorter or longer time. In today's time of multipolarity and duality, the system of values is no longer a constant. It depends on who values, when it is valued and for the reason for which it is valued. Of course, all of this is extremely important in the function of interest, primarily individual. Evaluation of knowledge, or technology, has become a matter of lateral marketing, lobbying and of course of interest. Under such influence from the environment, the poor and underdeveloped countries can hardly be adequately suppressed by the views of the developed ones. These attitudes of the developed people are successfully transmitted through the education system and relatively little financial motivation through various agencies and other organized and unorganized mediators. In the ambient interwoven with various partial knowledge, interests, marketing and lobbying for making the right decisions, it is very important that people in the underdeveloped and poor countries understand the importance of multidisciplinary knowledge. Only systemic multidisciplinary knowledge allows poor countries or any entity to behave optimally at a lower hierarchical level. Only optimal behavior when it comes to developmental systems such as energy, requires designing an optimal development path. Various criteria must be respected for these paths to be projected. When it comes to modern technology or some other phenomenon of contemporary character, one must never lose sight of the fact that it is a modern one primarily the determinant of time. This is the most modern one at the same time and optimal for the developed, but not for the poor. Due to this fact of a poor country, when it comes to technological development, they have to make an optimal solution between the traditional and the modern.

3 Model of integrated systemic energy management

The question arises what would be integrated systemic energy management for a country? Today, every system is extremely dynamic, open and susceptible to the growth of entropy. In order to be managed, there must be a projected and operational setup of a manageable system. A well-designed and operational set-up system is a more abstract solution that satisfactorily reflects selected inputs and outputs and intrusions and influences within the real desired system as well as the intrusion with the environment. An excellent system is one capable of effectively adapting to changes and proactively influencing the course of developmental changes. If the system enables effective management of development changes, we have a development system. When it comes to

systemic energy management, this means that it is managed efficiently by measured system value measures. Complex multiple hierarchical systems can not be measured by a measure of value, but by a greater number of selected value measures. The selected value measures must be quantitatively integrated into a smaller number so that the system can be mathematically modeled in order to set the optimal solution. When it comes to the energy system in addition to the optimal horizontal and vertical structure, it is often necessary to perform lateral optimization. What is more complicated today is the modeling of integrated system management, that is the changeability of the system's inputs and outputs in time. The problem is successfully solved using the phase of sets. The model of integral systemic energy management in the observation space The Republic of Serbia and the Republic of Srpska are based on the fact that the Republic of Serbia and the Republic of Srpska, besides the natural energy potentials, also have the personnel potentials for winning development and production of equipment for power plants . The effects that would be achieved by applying this development model of integrated energy management would be: accelerated socio-economic development of the Republic of Serbia and the Republic of Srpska, the development of modern energy systems based on their own knowledge, such electricity would have significantly lower cost of energy cost than in a variant when energy is produced by installing imported equipment and based on the knowledge of people from developed countries. This development model would also enable technological progress in other segments. The most important effect would be to stop the departure of highly educated professionals in the developed countries because the development and production of power plants is based on modern technologies that require highly educated personnel in electrical, mechanical, construction, ecological, geodetic, informatics and other waist.

4 Research synthesis

The scientific research problem is the study of the effects of the development and production of energy systems in countries that have natural energy potentials. The field of scientific observation is the poor countries of the former Yugoslavia that have a high level of renewable natural energy potentials. The first objective of the paper is to demonstrate whether it is possible to create a model for managing energy systems and processes based on domestic knowledge. Domestic knowledge should be incorporated into the development and production of equipment that would be used for the construction of new energy units for the production of electricity and heat. The second goal of the paper is to show that the implementation of the system model of integrated energy system development in the Republic of Serbia and the Republic of Srpska would be of exceptional economic and social benefit. The third goal is to familiarize the scientific, professional, management and the general public with the results of the research.

Basic research hypothesis: It is possible to create a model for integral management of the construction of new energies based on domestic development and domestic production of equipment for such electric and thermal power plants.

Additional research hypothesis: The application of an integrated system energy management model in the Republic of Serbia and the Republic of Srpska would be a driving force for accelerated national economic growth and development.

Both hypotheses are confirmed with a high probability of reliability. The following scientific research methods were used: systemic analysis and synthesis, induction and deduction method, scientific observation method and logical conclusion methods.

5 Conclusion

The poor and undeveloped countries under the burden of global influence do not have an integrated system of technological, economic and general social development. The concept of the development of an integrated industry based on domestic product development and domestic technologies is missing. Research shows that this is the result of the fact that existing economic structures do not have their own component research and development. The economy based on foreign development and technology creates only a greater gap in the level of development of developed and underdeveloped countries.

The solution to the problem is that in the underdeveloped countries of the former Yugoslavia all domestic management and technology expert structures take responsibility for the integrated concept of the development of the energy equipment industry on the basis of which new power and heat power plants will be built. The model created in this work allows this. The application of the given model would result in an accelerated development of the Republic of Serbia and the Republic of Srpska with significantly higher growth rates that would enable the technological gap to decrease compared to the developed countries. At the same time, the departure of young highly skilled personnel of all technical profiles would be stopped. The key obstacle is the unwillingness of the management structures, which today decide on development issues, to take responsibility for development based on domestic knowledge. New research is needed in the direction of operationalization and finding solutions for various resistance, obstacles and threats.

6 References

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