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GONCHARENKO I.

Kyiv National University of Technologies and Design

**IMPLEMENTATION OF PRIORITY TECHNOLOGIES IN
THE ENERGY-EFFICIENT MANAGEMENT OF
ENTERPRISES**

Purpose. *Justification of necessity to implement priority technologies in energy management of enterprises, determination of the conditions and factors that influence on the implementation of the energy efficiency strategy.*

Methodology. *The following general scientific methods have been used: the method of expert analysis (from the issues of efficient use of energy resources), analytical, and system ones (to define approaches of the implementation of energy efficiency strategy, the implementation of the latest energy-efficient technologies), economic analysis and diagnosis (grouping and generalization of energy efficiency measures for enterprises).*

Results. *The possibilities to improve energy efficiency of enterprises by means of the implementation of energy management systems have been considered.*

Scientific novelty: *The article considers problems of use of priority technologies in organization of energy management, the mechanisms of the implementation of the energy efficiency strategy have been proposed.*

Keywords: *energy management, energy efficiency, energy saving, management of energy supply, the mechanism of the energy efficiency strategy, enterprises.*

Introduction. The current state of the Ukrainian economy advances some new requirements for the functioning of enterprises. Enterprises consume significant amounts of various energy resources including all types of natural and transformed energy sources such as fuel, electric and thermal energy. Energy resources are essential and their lack may become a threat for the economic activity. Therefore, every enterprise needs organizing of the uninterrupted energy supply. The search for mechanisms of efficient management of the energy processes and resources is important as well. In many European countries, there are the state programs aimed at supporting of energy efficiency of enterprises, and attracting of investments into energy technologies. There are common Ukrainian programs for the development of energy efficient technologies in accordance with international standards (e.g. on the basis of Norwegian-Ukrainian cooperation in the renewable energy projects). The renewable energy sources in Ukraine have a great potential but are still not widely used. The European Bank for Reconstruction and Development launched a Program of financing of alternative energy to attract enterprises to participate in the implementation of projects for sustainable energy development. For the period of 2006-2013, the EBRD invested € 13 billion in 756 sustainable energy projects in 35 countries of the world.

Definition of objective. The main objective of energy management is to increase energy efficiency and energy saving. The limitation of energy resources affects all industries and is a global problem. The consequences are the following: inefficiency of the economy, low competitiveness of products, small sales volumes in the domestic and foreign markets, increased costs for export. The objective of this research is to substantiate the necessity of implementation of priority technologies in the energy management, and determine the conditions and factors that influence on the implementation of energy efficiency strategy.

Results of research. The issues of increasing of energy supply reliability and energy saving is now extremely important. To solve the problem of energy saving is possible only by implementing new technologies in the system of energy efficient management of enterprises.

The system of energy efficient management in enterprises is a complex of organizational, technical means and supply of programs and methodologies that work together to manage the production process so that only the minimum amount of electrical energy that is required to produce a certain number of products would be consumed.

As Ukraine imports a significant portion of energy to meet its needs of primary energy, more attention has been paid to the problems to switch to alternative energy sources.

However, there are a number of the factors that inhibit the implementation of programs of energy efficiency: 1) narrow regulatory framework for energy efficiency; weak organizational structures of energy efficiency management; 3) weak encouraging policies for pricing, taxes and customs related to energy efficiency; 4) insufficient use of scientific and technical capacity in the implementation of energy saving technologies; 5) limited informational support of energy efficiency policies.

Among Western scientists, the following ones have paid significant attention to study the energy management as an effective means for increasing energy efficiency: T. Mort, L. Brake, N. Jepsen, M. Stobbe, etc. The native researchers have also paid attention to the problem of effective management of energy economy of an enterprise. Among them there are the researchers Yu. V. Dziadykevych, O.V. Zakharova, V. V. Mykytenko, I. M. Sotnyk, D. O. Lazarenko, etc.

The concept of energy management is still quite new, and in the national literature there is no consensus regarding the implementation of this tool in business practices. The problems of use of priority technologies in the organization of energy management are being investigated as well as the basic conditions and factors of influence on the implementation of the energy efficiency strategy.

At present, the scientists have improved the system of management of electrical energy consumption in industrial production on the basis of classification of the stages of management of electrical energy consumption. This allowed taking into account the influence of external and internal factors of production on the formation of the electric capacity of products. The system of indicators of resource intensity of production has been supplemented by the indicators of electric capacity of natural output of products for integrated assessment of the impact of electrical energy on total resource intensity [1].

The mechanisms of management of energy saving have been investigated in terms of environmental factors. A new systematization of environmental and economic effects of energy saving has been suggested according to the stages in the life cycle of fuel and energy resources, which to the fullest extent takes into account the environmental, economic and social outcomes in evaluating the effectiveness of energy saving activities by business entities in different spheres of activity. The scientific and methodical approach to ecological and economic justification of energy saving within enterprises and government has been improved, on the basis of analysis of the conflict of their interests in the implementation of energy saving measures [2].

According to available world experience, the implementation and assimilation of energy management systems which are compliant to ISO 50001 standard, will become the key activities

related to increasing of energy efficiency of industrial enterprises [3]. The standard is provided to an enterprise, regardless of its size, territorial or geographic location, as well as a complete strategy of actions both in management and technical fields in order to increase the efficiency of the enterprise's energy system.

The basic idea for solving of management problems of increasing of energy efficiency consists in consecutive implementation of the systematic approach to energy management. Thus, additional opportunities to increase the level of energy efficiency may be obtained by applying the standard methodology PDCA (Plan-Do-Check-Act) which is typical for the international standards (ISO 9001, 14001 etc.). The additional arguments that explicitly demonstrate the advantages of the system of energy management arise from the opposing of systemic and non-systemic approaches to energy management. The targeted financing of municipal enterprises makes a significant contribution into the state programs for the development of renewable energy, within the framework of international cooperation. In 2015, Zhytomyr city received CHF 15.1 million from Switzerland for energy efficiency measures. The amount of such target financing exceeds three times the annual budget that is supposed for the city development [4].

The implementation of complex of accounting and analytical procedures for optimizing of energy costs, energy efficiency and financing of energy efficient measures is an important task of energy management for the enterprises that switch to renewable energy.

The energy management determines the method of energy consumption – economic or contract. In the case of using of the economic method, the enterprise's energy management provides a complex of organizational measures aimed at increasing of energy efficiency. These include: 1) organizing of material and technical support to regularly ensure resource base; 2) maintenance and effective use of energy equipment; 3) control over the manufacture of energy products with effective coefficient of efficiency; 4) control over energy consumption (at the points of arising of energy consumption). In the implementation of the contracting method, the list of functionalities of energy management is rather reduced and limited by calculating operations. However, the role of energy management of a contractor as a partner is increasing in ensuring of energy saving and implementation of energy efficient measures.

Conclusions. The problem of reducing of the energy intensity of production by at least 40% is a priority for managers of industrial enterprises on issues of energy efficiency. With the help of the goal setting agreements between the government and the companies in the industrial sector, it is possible to achieve significant results in energy saving and increasing of energy efficiency (long-term voluntary agreements). The experience in implementation of priority technologies of energy management should serve as a basis to develop a broad practice of making such agreements and to introduce the national standard for energy management which should be compatible with ISO 50001.

The task to increase energy efficiency should be included into the list of strategic issues at microeconomic and macroeconomic levels, without which any further progressive development of any economic activity is impossible. The basic mechanisms for implementation of energy efficiency strategy include creation of the necessary legal and regulatory framework for sectors of the economy; formation of a reasonable market environment; support of the strategic initiatives of business entities; technical regulation of energy efficiency.

References

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ВПРОВАДЖЕННЯ ПРІОРИТЕТНИХ ТЕХНОЛОГІЙ В ЕНЕРГОЕФЕКТИВНОМУ МЕНЕДЖМЕНТІ ПІДПРИЄМСТВ

ГОНЧАРЕНКО І.М.

Київський національний університет технологій та дизайну

Мета. Обґрунтування необхідності впровадження пріоритетних технологій в енергоменеджменті підприємств, визначення умов та факторів впливу на реалізацію стратегії енергоефективності.

Методика. Використано такі загальнонаукові методи: експертного аналізу (з проблем ефективного використання енергоресурсів), аналітичний та системний (для виділення напрямків реалізації стратегії енергоефективності, впровадження новітніх енергоефективних технологій), економічного аналізу та діагностики (групування і узагальнення енергоефективних заходів для підприємств).

Результати. Розглянуто можливості підвищення енергетичної ефективності підприємств завдяки впровадженню систем енергоменеджменту.

Наукова новизна. Досліджено проблеми використання пріоритетних технологій в організації енергоменеджменту, запропоновано механізми реалізації стратегії енергоефективності.

Ключові слова: енергоменеджмент, енергоефективність, енергозбереження, управління енергозабезпеченням, механізм стратегії енергоефективності, підприємства.

ВНЕДРЕНИЕ ПРИОРИТЕТНЫХ ТЕХНОЛОГИЙ В ЭНЕРГОЭФФЕКТИВНОМ МЕНЕДЖМЕНТЕ ПРЕДПРИЯТИЙ

ГОНЧАРЕНКО И.М.

Киевский национальный университет технологий и дизайна

Цель. Обоснование необходимости внедрения приоритетных технологий в энергоменеджмент предприятий, определение условий и факторов влияния на реализацию стратегии энергоэффективности.

Методика. Используются такие общенаучные методы: экспертного анализа (по проблемам эффективного использования энергоресурсов), аналитический и системный (для выделения направлений реализации стратегии энергоэффективности, внедрение новейших энергоэффективных технологий), экономического анализа и диагностики (группировки и обобщения энергоэффективных мероприятий для предприятий).

Результаты. Рассмотрены возможности повышения энергетической эффективности предприятий благодаря внедрению систем энергоменеджмента.

Научная новизна. Исследованы проблемы использования приоритетных технологий в организации энергоменеджмента, предложены механизмы реализации стратегии энергоэффективности.

Ключевые слова: энергоменеджмент, энергоэффективность, энергосбережение, управление энергообеспечением, механизм стратегии энергоэффективности, предприятия.