

ISSN 1563-0358  
Индекс 75881; 25881

ӘЛ-ФАРАБИ атындағы ҚАЗАҚ ҰЛТТЫҚ УНИВЕРСИТЕТІ

## ҚазҰУ ХАБАРШЫСЫ

Экономика сериясы

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КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ УНИВЕРСИТЕТ имени АЛЬ-ФАРАБИ

## ВЕСТНИК КазНУ

Серия экономическая

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AL-FARABI KAZAKH NATIONAL UNIVERSITY

## KazNU BULLETIN

Economy series

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№2 (114)

Алматы  
«Қазақ университеті»  
2016

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**The concept of transfer to energy  
effective economy by perfection  
of energy audit in the Republic  
of Kazakhstan**

Товма Н.А., Актуреева Э.А.,  
Акимбаева Қ.Т.

**ҚР энергоаудитті жетілдіру жо-  
лымен энерготімді экономи-  
каға көшу тұжырымдамасы**

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Акимбаева К.Т.

**Концепция перехода к энер-  
гоэффективной экономике  
путем совершенствования  
энергоаудита в РК**

In modern conditions of development the energy observation plays the key role because it is the complex technical-economical inspection of organization which is being made to receive authentic information on volume of energy resources used to identify the structure and effectiveness of energy expenses of organization, to detect the possibilities of energy-saving and increase of energy effectiveness. By the results of energy observation the report and energy passport of fuel-energy consumer are being generated. The aim of energy audit is to evaluate the effectiveness of fuel-energy usage and work out effective measures to decrease company's expenses. In article the steps of energy audit that stimulate its effective conducting are improved.

**Key words:** energy effectiveness, energy resources, energy audit, energy costs, energy savings, electric power supply, energy audit.

Қазіргі таңдағы экономиканың даму жағдайында энергетикалық зерттеулер ұйымның кешенді технико-экономикалық сараптамасы ретінде жетекші роль атқарады. Ол кәсіпорынның энергетикалық шығындар құрамын және олардың тиімділігін анықтау, энергоүнемділік мүмкіндіктерін іздестіру мен энергетикалық тиімділікті арттыру мақсатында пайдаланылатын энергетикалық ресурстар көлемі туралы сенімді ақпарат алу үшін жүргізіледі. Осы тұрғыдан бүгінгі күнгі маңызды міндет ретінде экономикалық саясаттың басым бағыттарының бірі болып энергоүнемдеу мен энерготімділікті арттыру табылады. Энергетикалық зерттеулер нәтижесінде отын-энергетикалық ресурстарды тұтынушының энергетикалық паспорты мен есептілігі қалыптасады. Сенімді энергожабдықтау – Қазақстан үкіметінің алдағы жылдары тұрақты экономикалық өсу жолындағы амбициялық мақсатына жетудің негізгі міндеттерінің бірі болып саналады. Энергоаудиттің мақсаты - отын-энергетикалық ресурстарды пайдалану тиімділігін бағалау және кәсіпорын шығындарын азайту үшін тиімді шаралар енгізу. Мақалада энергоаудитті тиімді жүргізуге ықпал етуші кезеңдер жетідірілген.

**Түйін сөздер:** энерготімділік, энергоресурстар, энергетикалық зерттеулер, энергетикалық шығындар, энергоүнемдеу, энергожабдықтау энергоаудит.

В современных условиях развития экономики ведущую роль играет энергетическое обследование, так как это комплексное технико-экономическое обследование организации, которое проводится для получения достоверной информации об объеме используемых энергетических ресурсов, с целью определения структуры и эффективности энергетических затрат предприятия, выявления возможностей энергосбережения и повышения энергетической эффективности. В этой связи, важной задачей на сегодняшний день является энергосбережение и повышение энергоэффективности как одно из приоритетных направлений экономической политики. По результатам энергетического обследования формируется отчет и энергетический паспорт потребителя топливно-энергетических ресурсов. Надежное энергоснабжение – одна из основных задач в достижении амбициозных целей, поставленных правительством Казахстана на пути к устойчивому экономическому росту на ближайшие годы. Цель энергоаудита - оценить эффективность использования топливно-энергетических ресурсов и разработать эффективные меры для снижения затрат предприятия. В статье усовершенствованы этапы энергоаудита, способствующие эффективному его проведению.

**Ключевые слова:** энергоэффективность, энергоресурсы, энергетическое обследование, энергетические затраты, энергосбережение, энергоснабжение, энергоаудит.



**THE CONCEPT OF  
TRANSFER TO ENERGY  
EFFECTIVE ECONOMY BY  
PERFECTION OF ENERGY  
AUDIT IN THE REPUBLIC  
OF KAZAKHSTAN**

Energy needs of mankind increases because of technological, industrial development and increase of population. The share of renewable sources in these conditions increases more.

Dependence of society on energy is really high and by the time is an only increase together with the development of economy. This dependence induces the necessity to create conditions for day to day provision of its final consumers with the required quantity and quality. Creation of this system in equal shares taking into account the interests of society, government and environment, is one of the main directions of national and international politics of the last years. Rational and ecological responsible usage of energetic resources is one of the main priorities of energy politics of most of countries, firstly members of EU. Republic of Kazakhstan is a competent participant of world society, accepted the obligations on accomplishment of missions settled on Agenda of XXI century (Rio de Janeiro, 1992) and declarations of Millennium Summit (New York, 2000) and World-wide summit on stable development (Johannesburg, 2002). Republic of Kazakhstan accepted measures directed on achieving of stable development. Kazakhstan is member and active participant of Stable Development Committee of UN, «Environment for Europe» and «Environment and stable development for Asia» processes, regional Eurasian network of World-wide counsel entrepreneurs for stable development [1].

Being political, cultural and economic bridge between Europe and Asia Kazakhstan performs the same connecting function in development of landscape and ecological systems of continent. Sizes of Republic of Kazakhstan, the variety of climate conditions, distinctive features of water balance of region drags essential dependence of the ecological situation of the whole Eurasia on its stability in Kazakhstan. Political situation in Kazakhstan demonstrates the whole world the unique example of stability, interdenominational harmony, development of democracy and social institutes in interests of all citizens of country.

In Message of President of Kazakhstan Republic N.Nazarbayev «Strategy «Kazakhstan 2050»: new political direction of successful country» the following statement was announced: «Humanity is on the threshold of Third Industrial Revolution that changes the meaning of production. Technological inventions cardinally change



the structure and needs of world markets. We live in totally different technological reality than before».

As for the production of energy resources in Republic of Kazakhstan, in 2015 its total volume was 2169,4 million tones (equivalent to oil), that includes: production of coal 58,8 million tones (equivalent to oil), comparing to 1991 the production of coal decreased to 12,2%, production of oil increased on 209% and it was 82,4 million tones, production of natural gas increased on 169,5% that was 17,3 million tones (equivalent to oil) [2].

In modern literature there is a whole part of definitions of statements «green increase», «green economy», «green jobs», «green sector of economy».

According to the UN Environmental program (UNEP) «green economy» – this is the economy that increases the welfare of people and provides social justice and at the same time essentially decreases risks for environment. In the very simple understanding «green economy» – is the economy with small emissions of carbonic compounds, effectively using resources and responding all the interests of environment.

«Green growth» is being characterized with the growing usage of «green technologies» in all sectors of economy, increase of «green jobs», production and usage of ecologically safe products and services. It is being aimed on support of economic development providing stable usage of natural capital, minimization of environment pollution and other forms of negative ecological impact.

«Green sector» of economy includes spheres actions in which directed on transformation of resources without spoiling environment and climate as much as possible, - «green energy», transport, recycling and utilization of waste etc.

According to UNEP «green jobs» – are the jobs in agriculture, processing production, SIECW, management, service providing sphere, that firstly makes impact on safety and regeneration of environmental quality.

Requirements to «green jobs» (according to the UNEP): «green jobs» are those in production or companies decreasing the impact on environment because of resources output increase, recycling and utilization of waste, and also because of retention and regeneration of ecosystems and bio variety. «Green jobs» should correspond criteria of deserving labor, means that it should be high-quality jobs, guaranteeing good salary, safe working conditions, employment, adequate perspectives of qualification increase and promotion, and also employees' loyalty. Right after the summit «Rio+20», that took place in 2012 in Brazil, development of «green

strategies» became one of the prior directions of economical politics either in developed or in developing countries. Kazakhstan became one of the first countries within the post-soviet space that switched to the «green development» way. Problem of energy saving and energy effectiveness is raised very sharply in municipal sector. In current conditions there is an aim – to modern economy of Kazakhstan. The law on «Energy saving and energy effectiveness» was issues. According to that law, there is the differentiated costing of consumed energy within the country. This measure stimulates people to rig up the devices to keep the records. As per law, starting 2013 there is a restriction on thermal energy delivery into new building without records keeping devices. Also law prohibits selling and production of electricity consuming devices without the identification of effectiveness class and on filament bulbs as well.

According to power balance of EEU of Kazakhstan for the period till 2030, that was issued by Government of Kazakhstan # 724 dated June 28 2014 «On issuing the concept of oil-energy development center till 2030», the power surplus in 2016 will be 1504 MVatt, in 2020 – 1874 MVatt, in 2025 – 1448 MVatt [3].

It was announced that Kazakhstan, Russia and Belorussia are going to form electricity-energy market in terms of Eurasian Economic Union by 2019 (EEM EEU). Countries are already in process of discussion of project concept creation program of this market, which in common production of energy is going to be largest in the world. In nearest 4 years members of EEM EEU have to take measures to harmonize legal-actual base in spheres of energy, technological regulations and standards, to prepare base for working subject to access the markets of other countries, and to create new common legal acts in sphere of energy.

The concept of Kazakhstan's switch to «green economy» is going to be implemented in 3 steps: 2013-2020 – within this period the main priority of government will be the optimization of resources usage, together with creation of «green» infrastructure. 2020-2030 - on the base of created «green» infrastructure it is going to be started the transformation of national economy, oriented on careful usage of water, stimulation of development and wide implementation energy regeneration technologies, as well as construction of objects on the base of high standards of energy effectiveness. 2030-2050 – the switch of national economy to the principles of as it called «Third Industrial Revolution», that requires the usage of natural resources in conditions



of its regeneration and stability. Issues of transfer to «green economy» will be regulated with legislative acts of the Republic of Kazakhstan on issues of transfer to «green» economy.

The instruments of realization of definite aims of the Concept by sectors are acting program documents taking into account changes and amendments in terms of main directions of Concept such as Program of agricultural complex development in the Republic of Kazakhstan for 2013-2020, «Agricultural business 2020», Governmental program on forced industrial-innovative development of the Republic of Kazakhstan for 2010-2014 and 2015-2019, «Kazakhstan 2050» Strategy, Governmental program of education development of the Republic of Kazakhstan for 2011-2020, programs of territory development, strategical plans of governmental authorities, the list of field programs, that will be corrected and the new accents on the following issues will be done: the increase of air quality, management of production waste, the struggle with land degradation, increase of soil fertility, fishing development and regeneration of fish resources.

One of the main instruments of energy effectiveness increase is the enhancement of energy audits in the Republic of Kazakhstan.

Energy audit – collection and analysis of data on usage of energy resources in order to evaluate possibilities and potential of energy savings and preparation of conclusion. Right after the changes into the law «On energy saving and increase of energy effectiveness» that took effect in January 2015, the deadline for energy audit for the companies that are in the governmental energy register was moved from July 2015 to July 2016. By now among the 3270 companies the audit was conducted only by 7%. Energy auditors note that most of the companies do it only «for reporting», trying to decrease the potential of energy effectiveness.

There are 79 companies on Kazakhstan market suggesting services on energy audits with the accredited license from Ministry of investments and development. There is a Committee of Industrial security that is doing this accreditation and in general is dealing with the issues of energy saving. From the moment the law being issued in 2012 and from the moment tenders being issued people saw that right financial support is being done for the development, and companies without any experience in project working and even relative spheres started to express their interest to the issues of energy auditing and receiving the accreditation.

According to article 16 point 5 in the law «On energy saving and increase of energy effectiveness»

the subjects from governmental energy register, except governmental organizations have to receive conclusions on energy audit conducted within 3 years right after this Law took effect.

The main aim of energy audit is to find the ways and possibilities for energy saving and help to the subjects of monitoring to identify the directions of effective usage of energy resources.

There is an order of energy audit conducting approved by the Government of the Republic of Kazakhstan # 1115 dated 31 August 2012 with the «Regulations of energy audit conducting».

According to that regulations the energy audit consists of 4 main parts:

Preparation step. Aims of that step are to create a program of conducting the energy audit (pointing all deadlines and the full list of objects that are on company's balance sheet) and to form the list of necessary documentation and information that have to be provided to customer.

Measuring (Trial) step. Aims of that step are to measure and register the characteristics of energy resources consumption with the help of stationery or/and portable devices, to investigate oil-energy streams on object in general or partially.

Analyzing step. Aims of that step are to analyze information and records (calculations of actual figures of energy effectiveness of buildings and types of equipment with all the standards) received from measuring step and to analyze the effectiveness of object's oil-energy resources usage.

Conclusive step. Aims of that step are to summarize analysis of energy resources consumption by building, objects, equipment by groups and types of energy sources and to give the conclusion on energy saving and ways to increase energy effectiveness of the object in general and partially.

In order to make the the energy investigation to be more effective it is necessary to operate the process of energy inspection more efficient.

We think it is necessary to make the steps of energy audit detailed:

I step. Evaluation of actual effectiveness of innovations and measures implemented before.

II step. Evaluation of energy effectiveness of resources' potential and determination of main directions of rational energy consumption.

III step. Working out the energy passport.

IV step. Working out the program of energy effectiveness increase.

Thereby, energy inspection, in other words «energy audit» this is first of all an activity directed on evaluation of energy resources consumption and working out the measures on its shortening in company.



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