

ENERGY EFFICIENCY THROUGH ISO 50001 ENERGY MANAGEMENT SYSTEM

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Abstract. *The article discusses that in manufacturing industrial enterprises in developed countries, it is necessary to develop power consumption management based on increasing the efficiency of use of electrical energy and energy resources, assessing energy saving reserves by determining scientifically based values of indicators per unit of production, as well as based on the development of measures for their rational use.*

Keywords: *energy management, ISO 50001 energy management, quality, measurement.*

Energy management is an advanced direction in organizing and running a business in a highly competitive environment. The main goal of enterprise energy management is the efficient use of energy resources and reliable operation of the organization's energy system.

The International Organization for Standardization - ISO in 2008 developed a new international standard, which became the most innovative standard in the field of energy management after approval on June 15, 2011. It received the name "Energy Management Systems – Requirements" and the international designation ISO 50001.

The energy management system includes the following points: energy supply; measuring, documenting and maintaining required records of energy use; selection and procurement of energy production equipment, processes and systems.

When developing an energy management system, you need to go through four stages:

1. Performing a preliminary audit in the management system.
2. Development of an energy management system and its implementation in accordance with the ISO 50001 standard.
3. Carrying out internal audits of the company. Analysis of the effectiveness of the energy management system. Pre-certification audit.
4. Certification audit. (Produced under a contract with a certification body).

The implementation of an energy management system at an enterprise provides the following advantages:

- expands and structures the understanding of the significance of energy use processes;
- provides a systematic, structured approach to the process of integrating efficient energy consumption into corporate culture, as well as into the practice of everyday management in industry;
- forms plans for continuous improvement of energy performance;

– is the organizational basis and structure for continuous work to improve energy performance, regardless of personnel changes.

In Figure 1 shows the trend of changes in the energy intensity of GDP for 2001-2019, from which it can be seen that energy intensity decreased from 0.738 thousand k.o.e. / dollar to 0.152 thousand k.o.e. / dollar or 4.85 times

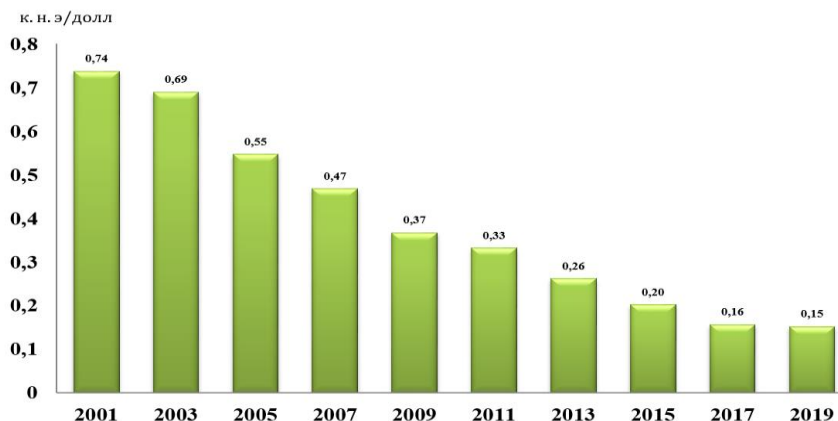


Fig.1. Dynamics of changes in the energy intensity of Uzbekistan’s GDP for 2001-2019

As you know, according to Appendix 5 to the protocol of the Republican Commission on Energy Efficiency and Development of Renewable Energy Sources No. 59 dated November 9, 2020, the target program “Program of target indicators for reducing the energy intensity of the economy by 1.5 times by 2030 by economic sectors and by types of activities” was approved, according to which ministries, departments and organizations are tasked with reducing the energy intensity of products by 2030 to 0.0976. koe/dollar (currently, this figure is 0.1405 koe/dollar) (Fig. 2).

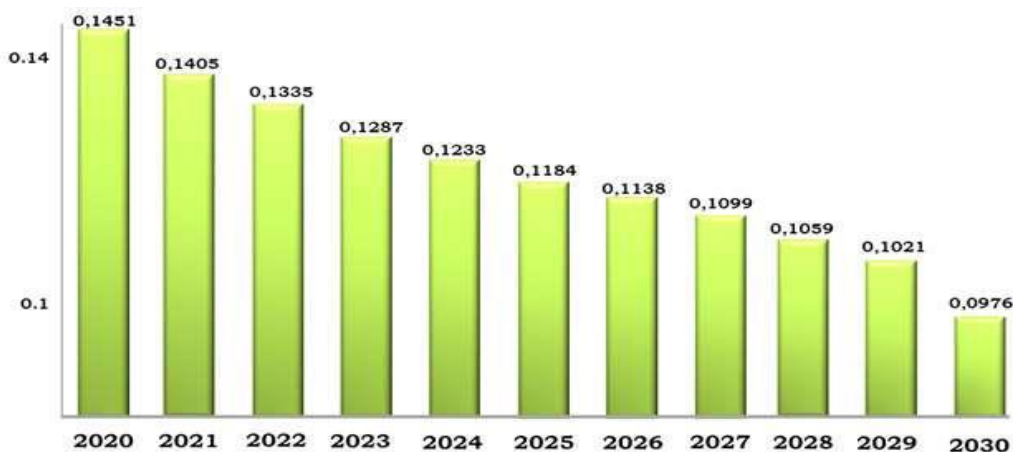


Fig.2. Dynamics of changes in the energy intensity of Uzbekistan’s GDP for 2020-2030

As a result of the implementation of the energy management system according to the ISO 50001 standard, the following is ensured:

- increasing the investment attractiveness of the enterprise;
- reduction of costs up to 15% on fuel and energy resources;
- operational management of energy consumption and costs.

An enterprise that has implemented and certified an energy management system gains the opportunity to:

- improve the production cycle;

- provide evidence of the functioning of the energy management system in accordance with the requirements of the ISO 50001 standard;
- increase your energy efficiency;
- timely carry out effective measures to save energy;
- implement plans related to improving the effectiveness of energy saving by analyzing current and expected energy consumption;
- receive returns from energy saving measures in the form of financial profit.

Benefits that certification provides:

- high level of competence and authority in the field of energy;
- the possibility of undergoing an energy audit together with certification according to the standard;
- experience in implementing management systems in energy companies;
- expanding knowledge and experience in technical issues when implementing an energy management system.

The ISO 50001 standard ensures effective management of fuel and energy resource costs and is used as a tool to improve business efficiency and competitiveness.

Let's consider a diagram (Fig. 3) showing the behavior of an ordinary consumer who wants to reduce the costs of purchased energy resources.



Rice. 3. Reducing costs for purchased energy resources

An additional benefit of the ISO 50001 standard is its integration with other standards:

- ISO 31000:2009 Risk management;
- OHSAS 18001 Occupational Safety and Health Management;
- ISO 9001 Quality Management Systems;
- ISO/IEC 27001 Information security;
- ISO 26000:2010 Social responsibility;
- ISO 14001 Environmental management;
- ISO 28000 Supply chain security and more.

The new international standard forms the basis for industrial and commercial companies to continuously improve their energy capacity - increasing competitiveness, saving money, reducing environmental pollution.

It is necessary to understand that the ISO 50001 standard only formulates requirements: what must be done in the organization and how all this will be done must be set out in the “Energy Manual” of the enterprise. It should describe all the elements of the organization's activities

through which it achieves the requirements of the ISO 50001 standard and the activities of the persons involved in this work.

To implement an energy management system, the following procedures are required in the organization:

- “energy planning”;
- ensuring the required level of personnel competence;
- management of documentation (including technical) that supports activities in the field of energy management;
- working with potential and actual non-conformities, and, in addition, taking corrective and preventive actions, based on the importance of achieving energy goals and the possible consequences if they are not taken.

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