

# STATUS OF APPLYING OF INTERNATIONAL ENERGY MANAGEMENT STANDARDS IN UKRAINE

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In the current realities of Ukraine concerning the country's energy supply problem is energy conservation and efficiency is one of the country given the orientation of the most relevant, its decision should be in the direction of European integration, which implies that the requirements of the relevant EC Directives and the implementation of international standards. Directives such as there is 2010/30 / EU on the labeling and standardized information on energy consumption, 2009/125 / EU on the requirements for eco-design of products related to energy consumption 2010/31 / EU on the energy performance of 2009/28 / EC of buildings to support the use of energy from renewable sources and others. But the basic Directive on energy efficiency can be regarded as Directive 2012/27 / EU [1], the adoption of which resulted in significant changes to the Directives 2010/30 / EU and 2009/125 / EU and the abolition of 2004/8 / EC Directive on the promotion of cogeneration based on the demand for useful heat in the internal energy market and 2006/32 / EC on energy efficiency and energy services. Implementation of Directive 2012/27 / EU in Ukraine is today an urgent task, which in turn requires a legal and regulatory support, in particular the use of relevant international standards. a number of issues, in particular the EU Directive requirements and a description of the international standards of ISO 50000 energy management, in general, has already been presented in the literature, but it is necessary to stress the requirements of the new Directive 2012/27 / EU for the construction of efficient energy management systems and identify groups of related applied, which should be harmonized in Ukraine for the practical implementation of the Directive. Directive 2012/27 / EU introduces an integrated approach to energy conservation policy at all stages of production, transformation, supply and consumption of energy and sets the overall framework for measures to promote energy efficiency in the European Union in order to ensure achievement of the objective of the EU - raising of the energy efficiency 2020 20 % - and laying the way for further energy efficiency improvements beyond that date. One of the most effective mechanisms to ensure rational use of energy is the energy audits and implementation of energy management systems of different levels.

The requirements of Directive 2012/27 / EU (Article 8) to conduct energy audits are intended to maximize the use of energy-saving potential, and extend to large, medium and small enterprises, in particular in large enterprises energy audits should be mandatory and regular and for small and medium-sized enterprises at the national level should develop programs to encourage such companies to conduct energy audits and the subsequent implementation of the recommendations from these audits. At the state level is also provided for the development of programs to raise awareness of households about the benefits of such audits and training to improve the skills of energy auditors programs, the possibility, if necessary, to implement incentive schemes and support for the implementation of recommendations from the energy audits and similar measures. Particular attention is paid to ensure that energy audits conducted in an independent and cost-effective way by qualified and (or) accredited experts or implemented and supervised by independent authorities under national legislation. Annex VI of the Directive contains the minimum criteria for energy audits, according to which the energy audit is [1]:

- based on measured operational data on energy consumption and load profiles that can be tracked;
- include a detailed overview of the profile of energy consumption of buildings, industrial facilities or installations, including transportation;
- as far as possible based on an analysis of the costs over the entire life cycle;

- to be comparable and representative to obtain a reliable picture of overall energy efficiency and to identify the most significant opportunities for improvement.

Directive 2012/27 / EU also defines general principles for calculating the amount of electricity produced in cogeneration for different technologies (Annex I), the method of determining the efficiency of cogeneration (Annex II), a conversion table for the energy content of various fuels for final consumption ( Annex IV). The purpose of the audit is to clear information on potential savings, based on detailed calculations and confirmed. Separately noted that energy audits must comply with European and international standards, such as EN ISO 50001 (energy management system), EN 16247-1 (energy audits), EN ISO 14000 (Environmental Management Systems).

Today came into force in Ukraine, international standards of ISO 50000 for the energy management, which became the basis for building energy management systems and energy audits in the EU. basic standard in this series – ISO 50001 – is based on the methodology of continuous improvement PDCA processes: Plan , Do, Check, Act.

The same principle is set basic standards of other ISO management system that provides a high level of compatibility of ISO 50001 with ISO 9001 Quality Management System, ISO 14001 Environmental Management System, OHSAS 18001 Occupational Health and Safety Management System [3], which is already implemented in Ukraine. This approach creates the conditions for the integration of different management systems in the enterprise.

A series of energy management standards ISO 50000 consists of six documents, requirements which apply to organizations of all types and sizes regardless of the types of energy:

- ISO 50001 specifies requirements for the design, implementation, maintenance and improvement of the energy management system to continuously improve energy efficiency and reduce harmful effects on the environment. This standard can be used for the certification of energy management systems and the comparison of different organizations;

- ISO 50002 defines the principles of the energy audit, the requirements to the process of the audit and the outcome;

- ISO 50003 specifies requirements for the competence, consistency and impartiality of the audit and certification of energy management systems for bodies providing these services. This standard is intended for use in conjunction with ISO / IEC 17021-1 «conformity assessment. Requirements for bodies that carry out audit and certification of management systems. Part 1: Requirements »;

- ISO 50004 provides practical guidance and examples to create, implement, maintain and improve the energy management system according to a systematic approach in accordance with ISO 50001;

- ISO 50006 provides general principles and guidelines on the definition of energy efficiency, using a baseline of energy consumption and energy efficiency;

- ISO 50015 defines general principles and guidelines for planning and carrying out measurement and verification of energy efficiency in the organization or its components.

To create opportunities for the application of the above standards to the full to analyze the relationship of these standards, to identify other related standards and determine what standards should be harmonized in Ukraine.

As shown by comparative analysis of the existing national standards of Ukraine and international standards, as shown, to date harmonized are the basic standards of the various management systems (DSTU ISO 9001 DSTU ISO 14001, State Standard OHSAS 18001, DSTU ISO 22000, DSTU ISO 50001) on the implementation of audit systems management (DSTU ISO 19011), the requirements for bodies providing audit and certification of management systems (DSTU ISO / IEC 17021), the requirements and guidance for the validation and verification of data on the amount of greenhouse gases (DSTU ISO 14064-3) standard, and regulating the nominal and performance of electrical rotating machines (DSTU EN 60034-1). This represents 26% of the total number of international standards required for the development and implementation of energy management systems, besides some existing DSTU need to be updated according to the new versions of international standards, have received major changes (ISO 9000: 2015, ISO 9001: 2015, ISO 14001: 2015, ISO / IEC 17021- 1: 2015).

So, we can say that there are national standards harmonized with international, which are fundamental for the creation of efficient energy management systems. However, the requirements of Directive 2012/27 / EU fully expedient is to harmonize all the ISO 50000 series of standards, as well as the related series of standards EN 16247 (energy audits), ISO 11011 (evaluation of the energy efficiency of compressed air systems), ISO / ASME 14414 (evaluation energy pump installations), ISO 80000-1 and IEC 60027 series (scientific and mathematical quantities and their units, letter

symbols), ISO / IEC / TS 17022 (requirements and recommendations for the content of the report of the Audit management system, conducted by a third party), ISO / IEC / TS 17023 (installation for determining the duration of the certification audits of management systems), ISO / TR 16344 (terms, definitions and symbols to assess the energy performance and energy certification of buildings), ISO 16818 (the terminology of energy efficiency in the design of engineering systems of buildings) , ISO 17747 (determination of the energy saving potential in organizations), ISO / IEC guide 98-3 (guide to the expression of uncertainty in measurement).

### CONCLUSIONS

1. For the implementation of Directive 2012/27 / EU on energy efficiency in Ukraine is necessary to use relevant international standards, first of all, referred to in Directive 2012/27 / EU, namely EN ISO standards 50001 (energy management system), EN 16247-1 ( energy audits), EN ISO 14000 (environmental management system), which are based on the methodology of continuous improvement PDCA process that creates conditions for the integration of different management systems in the enterprise.

2. Define a group of related international standards which need to be harmonized in Ukraine in order to build effective systems for energy management and optimization of energy audits in accordance with the requirements of 2012/27 / EU Directive.

### REFERENCES

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