HOW DOES ENERGY POLICY INFLUENCES SUSTAINABLE COMPETITIVENESS OF INDUSTRIAL ENTERPRISES?

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Energy plays a crucial role in economic growth and vital prosperity for the organization as well as for the nation and the state as a whole. That is why the availability and reliability of energy supply has always been a concern.

The vast majority of energy consumed today comes from fossil fuels. The use of fossil fuels comes with a cost burden and a negative impact on the environment. Given the fact that most of the fossil fuel resources are depleted today, the availability and reliability of energy in the future is already a matter of concern for most today. Ensuring energy security is becoming one of the primary tasks for creating conditions for the normal functioning of all sectors of the economy.

The issues of energy saving, energy efficiency, as well as the formation of an energy saving strategy at industrial enterprises, have recently increasingly attracted the attention of scientists, economists and politicians. Among such scientists, we can highlight: Simone Tagliapietra [3], Will Kenton [4], Matteo Ciucci [5], Mokronosov A.G, Mavrina I.N. [14], Pavlyk A.V. [15], Kupchak V. [17], Lavrenchuk V. [21], Pudycheva G. [23], Zapashchuk L. [24] and others.

However, it should be noted that, despite a significant amount of work, the question of the influence of energy policy on the sustainable competitiveness of industrial enterprises remains insufficiently studied.

The purpose of the study is to study the level of influence of energy policy on the sustainable competitiveness of industrial enterprises.

States are developing sets of government measures aimed at long-term stabilization of the domestic energy market and ensuring the efficiency of the functioning of the national economy in the face of

severe instability in world prices for natural non-renewable energy sources. These measures constitute the energy policy.

The main goal of national energy policies is to ensure demand with a reliable supply. In the study of the World Energy Council, this thesis is confirmed and supplemented: "Security of energy supply is the most important motivating factor for energy transformations in the world"; "another important factor is the reduction in the cost of energy supply." The third most important factor of the study is environmental protection and public perception [1].

Global energy scenarios reflect the ecological and climatic consequences of economic activity, the growing tension with the provision of one or another type of energy resources of countries and regions, as well as globalization, integration and localization processes in the world energy system. International energy analysis and policy centers declare ambitious energy goals for achieving the share of renewable sources, increasing access to energy resources, achieving energy efficiency indicators, etc. At the same time, they recognize that the implementation of one or another scenario mainly depends on groups of countries with a rapid increase in energy demand. Therefore, the energy goals, which are technological in nature, take on an institutional and geopolitical color, and the scenarios require analysis and modeling from the standpoint of the political economy of energy transformations.

It is well known that the level of energy consumption in Ukraine is excessive. Therefore, the promotion of energy efficiency and the development of renewable energy sources (RES) should become the top priority. This will not only help reduce imports, but will also provide significant savings that will boost the economy.

In Ukraine, the introduction of mandatory energy targets will help solve three main tasks at once - reducing dependence on imported fossil fuels, reducing carbon dioxide emissions, as well as stimulating economic growth and creating new jobs.

After signing the Association Agreement with the European Union, Ukraine should set itself goals that are comparable to those of the EU.

Energy is a fundamental factor in the construction of European Union project. The deep interaction and cooperation among the founding members of the Union crystallized around energy considerations.

The disastrous effects of the Second World War and the constant threat of an EastWest confrontation meant that Franco-German reconciliation had become a top priority. The decision to pool the coal and steel industries of six European countries, brought into force by the Treaty of Paris in 1951, marked the first step towards European integration. The Treaties of Rome of 1957 strengthened the foundations of this integration, as well as the notion of a common future for the six European countries involved [2].

To provide a common policy with a precise set of rules and instruments based on exclusive supranational powers conferred to a central institution [3, p.12-16]:

- The High Authority in the case of ECSC;
- The Supply Agency in the case of Euratom

Together with European Economic Community, foundations of current EU.

After initial momentum, role of energy in EU construction weakened over time:

- Single European Act of 1986…
- Treaty of Maastricht of 1992…
- Treaty of Amsterdam of 1997…
- Treaty of Nice of 2001…

But none of these treaties gave to the EU clear competences on energy!

The Lisbon Treaty, also known as the Treaty of Lisbon, updated regulations for the European Union, establishing a more centralized leadership and foreign policy, a proper process for countries that wish to leave the Union, and a streamlined process for enacting new policies.

The treaty has signed on December 13, 2007, in Lisbon, Portugal, and amended the two previous treaties that established the foundation for the European Union.

Key takeaways of the Lisbon Threaty [4]:

- the Lisbon Treaty updated European Union (EU) regulations, establishing more centralized leadership and foreign policy, a process for countries that want to leave the EU, and a streamlined process for enacting new policies;
- the treaty was built on existing treaties but adopted new rules to enhance cohesion and streamline action within the EU;
- the Lisbon Treaty also replaced the previously rejected Constitutional Treaty, which attempted to establish a Union constitution.

Using the "encirclement strategy" the EU has created a wide legislation on energyrelated issues, particularly using the competitiveness and environmental tools.

In particular, since the 1990s the EU has adopted a series of Directives aimed at liberalising electricity and gas markets, with the aim of opening-up national markets to competition and of creating an EU single energy market.

The process started with the adoption of:

- the Directive 96/92/EC concerning common rules for the internal market in electricity;
- the Directive 98/30/EC concerning common rules for the internal market in gas.

The first and the second legislative packages focused on development of market access, notably, the Directive 2003/54/EC and the Directive 2003/55/EC introduced the free choice of electricity and gas suppliers.

The Third Energy Package was adopted in 2009 with the aim to further liberalise and integrate Europe's energy markets.

The Package pursues the general objective of completing the European Union Internal Energy Market (IEM) and contains provisions on a number of aspects related to electricity and gas supplies, in particular in the following areas: unbundling energy suppliers from network operators; strengthening the independence of regulators; establishing the Agency for the Cooperation of Energy Regulators (ACER); enhancing cross-border cooperation between transmission system operators and the creation of European Networks for Transmission System Operators (ENTSO-E and ENTSO-G); open, fair

retail markets and consumer protection, contract switching, contract termination fees, billing of electricity and gas consumption, the right to receive information on energy consumption, quick and cheap disputes resolution [5].

With regard to consumer protection, the Third Energy Package prescribes the EU Member States to define the concept of vulnerable consumers at the national level and adopt the measures to protect such consumers and to address energy poverty.

The Third Energy Package consists of the following legal instruments [6]:

- Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC;
- Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity;
- Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC;
- Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005;
- Regulation (EC) No 713/2009 of the European Parliament and of the Council of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators.

Challenges facing the EU in the field of energy include issues such as increasing import dependency, limited diversification, high and volatile energy prices, growing global energy demand, security risks affecting producing and transit countries, the growing threats of climate change, decarbonisation, slow progress in energy efficiency, challenges posed by the increasing share of renewables, and the need for increased transparency, further integration and interconnection in markets [7].

A variety of measures aiming to achieve an integrated energy market, security of energy supply and a sustainable energy sector are at the core of the EU's energy policy.

EU-wide objectives for climate and energy were agreed by heads of state and government in 2007, and enacted in legislation in 2009. These energy and climate objectives are framed around three headline targets for 2020. These main targets are shown in Figure 1.

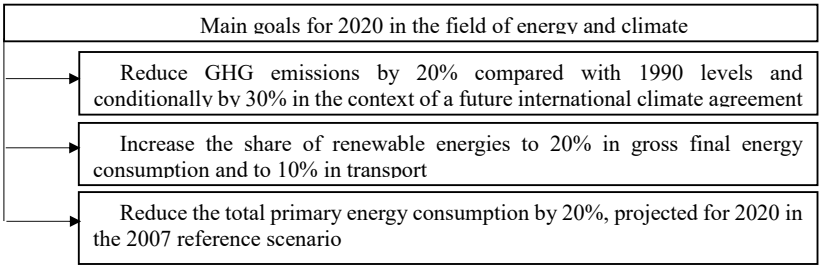

Figure 1. Three main goals for 2020 in the field of energy and climate

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The 2020 Climate and Energy Package consisted of EU-wide GHG reduction effortsharing (Decision 406/2009/EC) in the EU wide carbon market based on the EU Emissions Trading System (ETS) Directive 2009/29/EC and with individual targets for each member state in the sectors outside the EU ETS. Equally, the Renewable Energy Directive (RED) (2009/28/EC) and Energy Efficiency Directive (EED) (2012/27/EU) require member states to set indicative national targets for achieving the EU-wide goals. The package was complemented by the Carbon Capture and Storage Directive (2009/31/EC) and the Biofuel and Fuel Quality Directive (2009/30/EC) as well as the Emission Standards Regulation (EC) No 443/2009.

The 2020 Climate and Energy Package relied on strong EU-wide instruments, including the EU ETS, the internal energy market and harmonised EU-wide energy efficiency policies and measures (eco-design, building codes and energy performance certification for buildings, CO_2 standards for light-duty vehicles).

According to the Energy Union (2015), the five main aims of the EU's energy policy are next (Figure 2).

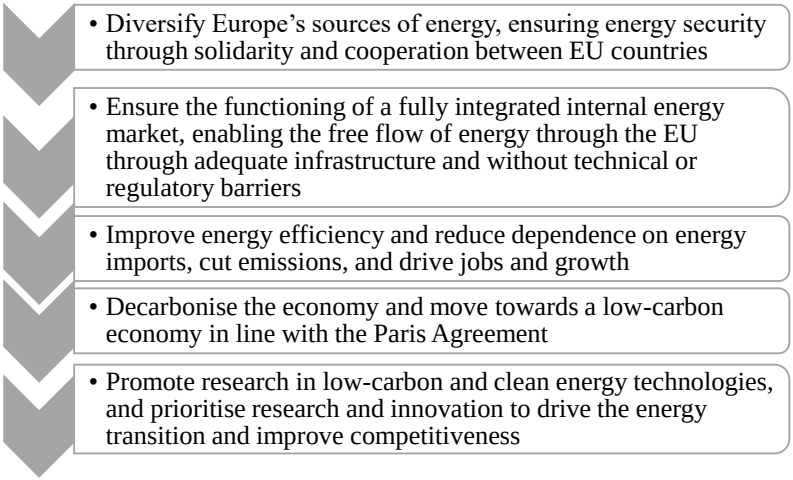

Figure 2. The main objectives of the EU energy policy
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Article 194 of the TFEU makes some areas of energy policy a shared competence, signalling a move towards a common energy policy. Nevertheless, each Member State maintains its right to 'determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply' (Article 194(2)).

To implement the Energy Union Strategy, the Commission proposed the Clean Energy for All Europeans package (also known as the Clean Energy Package [CEP]). It consisted of eight legislative acts, which were adopted during 2018 and 2019:

- Electricity Market Directive 2019/944/EU and Electricity Market Regulation 2019/943/EU ACER Regulation 2019/942/EU
- Regulation on Risk-Preparedness in the Electricity Sector Regulation 2019/941/EU and Repealing the Security of Supply Directive
- RED 2018/2001/EU (RED II)
- EED 2018/2002/EU (EED II)
- Energy Performance of Buildings Directive 2018/844/EU (EPBD)

- Regulation 2018/1999/EU on the Governance of the Energy Union.

Prior to the CEP, EU-wide headline targets were in place for 2030 to cut GHG emissions by 40% from 1990 levels, to increase the share of renewable energy and foster energy efficiency, while boosting interconnectivity and tackling emissions from cars, vans and trucks. The CEP has increased the ambition of the Energy Union for renewable energy and energy efficiency action to enable it to meet the overall emissions reductions target for 2030 [10].

Energy efficiency first: the revised EED II sets a target of efficient energy use for 2030 of 32.5% (compared with business-as-usual projections of 2007), and the new EPBD aims to maximise the energy saving potential of smarter and greener buildings and to boost the renovation of existing buildings.

More renewables: an EU-wide target of at least 32% in renewable energy (as opposed to national targets in RED I) by 2030 is fixed under RED II, which includes specific provisions to ensure that public support, if granted, is cost-efficient, to facilitate self-consumption and the creation of renewable energy communities, and to foster renewables in the heating and cooling and the transport sectors.

Governance of the Energy Union: A new governance regulation under which each member state drafts National Energy and Climate Plans (NECPs) for 2021-30 setting out national ambitions (national voluntary targets) and the policies to contribute to meeting EUwide targets. In a first round, member states shared their draft NECPs with the European Commission which reviewed them and provided country specific recommendation. In spring 2020, most EU countries submitted the revised final plans to the European Commission.

More rights for consumers to produce, store or sell their own energy, including more transparency on bills and choice.

A smarter and more efficient electricity market to increase security of supply while helping integrate renewables and improving cross-border co-operation and the EU-wide assessment of adequacy needs and common rules for capacity markets (a new electricity regulation, an amending electricity directive, risk preparedness and a

regulation outlining a stronger role for the Agency for the Cooperation of Energy Regulators [ACER]).

In 2018, EU GHG emissions were 23% below the levels of 1990 – the EU has thus already reached its 2020 target. By the end of 2019, progress towards the renewables and energy efficiency target was not sufficient. The share of renewables stood at 18% in gross final energy consumption in 2019; the EU is thus broadly on track towards the 20% by 2020 goal. However, further efforts are needed to reach the target during 2019-20 and even up to 2030. The share of renewables stood at 32% in electricity, 8% in transport, and 19.7% in heating and cooling in 2018 [11].

Since the global financial and economic crisis in 2008-09, the role of energy efficiency in the EU has been important. Without energy efficiency, energy use and emissions would have been much higher. The rate of improvement has been slowing down and the EU off track towards its 20% target.

In November 2018, the European Commission presented a long-term vision for a climateneutral EU economy by 2050. The communication "A clean planet for all" (EC, 2018) includes scenario analysis with a baseline and eight alternative decarbonisation pathways (six with 80% GHG reduction and two with 100% GHG reduction, keeping global temperature rise to 1.5 degrees Celsius or less). All the scenarios rely on several pillars (Figure 3):

- Maximise the benefits from energy efficiency, including promotion of zero-emission buildings: A central role for energy efficiency is highlighted in all scenarios, including anticipated decreases in 2050 primary energy demand ranging from 32-50% below 2005 levels. In the residential sector, the Commission scenarios show energy reductions of 41- 57% in 2050, relative to 2005 levels.
- Maximise the deployment of renewables and the use of electricity to fully decarbonise Europe's energy supply: All scenarios rely on very high levels of end-use electrification (up to 53% by 2050), combined with full decarbonisation of the power sector. Renewable energy generation is expected to meet more than 80% of electricity demand, and nuclear would account for 15%.

- Embrace clean, safe and connected mobility: The EC highlights the essential role of clean vehicles, with the share of electric cars in the EU fleet surpassing 90% in net-zero emissions by 2050. It also shows the significant contribution of sustainable alternative fuels and of improvements in the efficiency of the transport system.
- A competitive EU industry and circular economy as key enablers to reduce GHG emissions: In industry, energy demand would need to decrease by between 22% and 31% by 2050 relative to 2015 in Commission scenarios. Develop an adequate smart network infrastructure and interconnections: The electrification and high renewables deployment requires increased cross-border and regional co-operation.
- Reap the full benefits of a bio-economy and create substantial carbon sinks: In the scenarios, bioenergy consumption will increase by around 80% by 2050 relative to today. Land and forest sinks could absorb between 240 million tonnes of CO_2 ($MtCO_2$) and 340 $MtCO_2$.
- Tackle remaining CO_2 emissions with carbon capture, utilisation and storage (CCUS): The European Commission underlines the role of CCUS as a valuable option for locked-in fossil fuel infrastructure and for generating negative emissions when combined with bioenergy. CO_2 captured in 2050 ranges from 50 $MtCO_2$ to 90 $MtCO_2$ in all but one scenario (which sees almost 300 $MtCO_2$ captured).
- Hydrogen and power-to-X also play an important role in some scenarios, notably in those with a strong focus on electrification. At the December 2019 European Council, the EU member states endorsed the Commission's vision for climate neutrality by 2050, with the exception of one member state which has asked for more time to implement such a goal. Under the UNFCC Paris Agreement, the EU and the EU member states are both invited to develop and submit 2050 long-term strategies (LTSs). It will be critical that member states ensure consistency between national LTSs to 2050 and the NECPs, in line with the Governance Regulation.

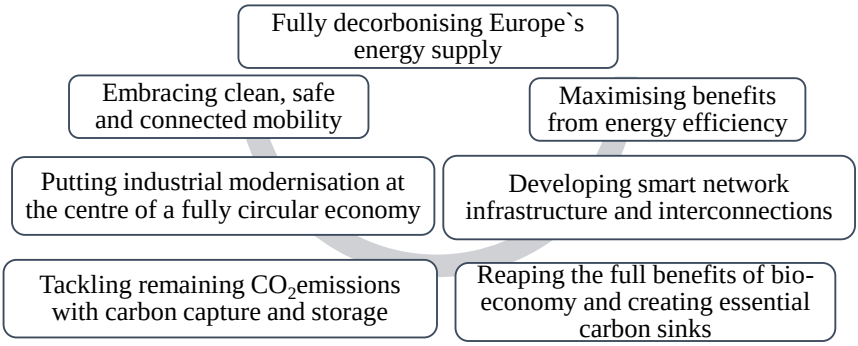

Figure 3. Road to climate neutral economy: strategic priorities
Sourse:[12]

Following all the goals of energy policy plays a decisive role for domestic enterprises.

The relevance of energy saving at the enterprise and increasing the energy efficiency of production is determined by the following factors [13]:

- High costs of energy resources. Currently, the level of expenditure on energy resources in the cost price of domestic products is many times higher than that of other countries, which reduces their competitive advantages.
- Constant growth of tariffs for energy resources, difficulty of connecting additional capacities. Annually, tariffs for energy resources for the enterprise grow inexorably, and every year this growth will be more intense.
- An increase in energy consumption limits production growth.
- Enterprises need a high-quality, reliable and uninterrupted supply of energy resources, which cannot be guaranteed by worn-out power equipment.

Today, there is a tendency for prices of traditional energy sources to rise in the territory of Ukraine. All this has a negative effect on the cost of production, and, as a result, on the price level. Unfortunately, the action of these factors has a negative impact on the competitiveness of domestic enterprises.

In the context of increasing competition for each enterprise, the task of maintaining and increasing its own competitiveness comes to the fore [14].

An increasing number of enterprises are focused on achieving victory in the competition and achieve their goals as a result of the constant efforts of management in the implementation of an effective competitive development strategy.

In the context of the global crisis, the problem of developing sustainable competitiveness has become particularly relevant due to the increased variability of the external environment and the lack of scientific and methodological development of many aspects of the formation and implementation of the competitive advantages of enterprises.

Energy saving should be understood as a reduction in the physical consumption of energy resources for the production of products, which leads to a decrease in the energy intensity of products. The main direction of energy-saving activities is to increase the efficiency of the use of energy resources in technological processes at consumers, when using energy resources in production and when they are distributed between production units [15]. At the same time, the most important result of energy saving should be considered a reduction of energy consumption, i.e. costs of providing the enterprise with energy resources, and ultimately - a reduction of the share of energy consumption in the total costs of production.

The Law of Ukraine "On Energy Conservation" No. 74/94 - VR dated July 1, 1994 interprets energy conservation as "...activity (organizational, scientific, practical, informational) aimed at the rational use and economical consumption of primary and transformed energy and natural energy resources in the national economy and which is implemented using technical, economic and legal methods" [16].

Based on this, it is possible to formulate the characteristics characteristic of the "energy saving" category [17]:

- effective use of primary (natural) non-renewable energy resources;
- involvement of renewable energy sources in economic turnover.

Unfortunately, modern energy consumption is largely based on the use of non-renewable reserves of fossil fuels - coal, oil and gas. As a result, this creates an energy problem: the rapid depletion of non-renewable types of fuel at increasing rates of its consumption.

One of the ways to solve this problem is the use of non-traditional sources of energy.

However, despite the recognition of the urgent need for alternative energy, the practical implementation of this direction is slow.

The effectiveness of the development of alternative energy sources depends primarily on the effectiveness of the regulatory and legislative framework, the main goal of which should be the creation of favorable conditions for work on the domestic renewable energy market.

The main regulatory legal acts that regulate legal relations in the field of alternative energy on the territory of Ukraine are the Law of Ukraine "On Alternative Energy Sources", adopted by the Verkhovna Rada of Ukraine on February 20, 2003, with amendments dated April 13, 2017 [18]. The main principles of state policy in accordance with this Law in the field of alternative energy are: increasing the volume of production and consumption of energy produced from alternative sources, with the aim of economical consumption of traditional fuel and energy resources and reducing Ukraine's dependence on their import by restructuring production and rational energy consumption according to due to the increase in the share of energy produced from alternative sources; attracting domestic and foreign investments and supporting entrepreneurship in the field of alternative energy sources, including through the development and implementation of national and local programs for the development of alternative energy. state policy. On December 29, 2016, the National Commission, which carries out state regulation in the fields of energy and communal services, adopted the Resolution "On the establishment of "green" tariffs for electricity for business entities and allowances to "green" tariffs for compliance with the level of use of Ukrainian-made equipment" [19]. In this resolution, a decision was made on the adoption of "green" tariffs for electric energy produced by economic entities at electric power facilities that use alternative energy sources, and a surcharge to "green" tariffs for

compliance with the levels of use of Ukrainian-made equipment. On December 20, 2018, the Verkhovna Rada of Ukraine issued the Resolution "On Adopting as a Basis the Draft Law of Ukraine on Amendments to Certain Laws of Ukraine on Ensuring Competitive Conditions for the Production of Electricity from Alternative Energy Sources."

On the territory of Ukraine, in September 2008, with the aim of creating investment attractiveness of the use of environmentally friendly energy sources, the Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding the Establishment of a Green Tariff" was adopted [30]. According to this tariff, the state buys electricity produced at power plants that use alternative energy sources. In April 2009, the effect of the "green" tariff was improved at the legislative level. Namely, the validity period of the "green" tariff was extended until January 1, 2030, and the amount of the tariff was tied to hard currency - EUR 0.113 per 1kWh.

Alternative energy continues to spread. The reason is its clear advantages over traditional sources, which are difficult to refute. In some countries, the government runs complex public programs with huge financial investments for gradual replacement, but so far the results remain insignificant.

Alternative energy sources are renewable sources, which include the energy of solar radiation, wind, seas, rivers, biomass, Earth's heat, and secondary energy resources that exist constantly or appear periodically in the environment [20].

In recent years, the developed countries of the world increasingly began to focus on the problem of financing the development and implementation of alternative technologies. The main reasons for revitalizing the discussion of this topic are [21, p.1]:

- exhaustive character of non-renewable fuel and energy resources (FER);
- the absence of a real possibility of their complete replacement at the moment;
- the general trend of rising prices for traditional energy resources, caused by the rarity of the product and artificial restrictions on its production;

- instability in the markets of fuel and energy resources due to the speculative nature of operations;
- the difficult political situation in the part of the countries of extraction of PER, as well as transit countries;
- efforts to increase the country's energy security as a component of economic security.

The following main reasons for actively investing in the development of alternative energy can be identified.

1. "Green" energy has become cheaper.
2. Alternative energy creates new jobs (this issue is especially important for consideration of rural regions, where the construction of plants operating on biomass is a very promising business).
3. Renewable energy sources can increase the country's energy security (replacing traditional fuel and energy resources, most of which are imported, with alternative sources will reduce the state's dependence on energy supplier countries and the negative consequences of fluctuations in the market price of gas and oil).
4. Alternative energy is much more attractive for investors, because it is a rapidly growing market with a high level of profitability.
5. Renewable energy requires significantly less state subsidies.
6. "Green" energy is able to improve the existing environmental condition (a vivid example is the reduction of carbon dioxide emissions by industrial enterprises and thermal power plants).

The high energy intensity of products of domestic industrial enterprises makes it impossible to compete at both the national and global levels. Therefore, energy saving is a very relevant issue that is being discussed today not only in Ukraine, but also all over the world.

Achieving a real improvement in the energy efficiency of enterprises should be based not only on technical solutions, but also on better management. Recognizing the importance of energy as a resource that requires the same management as any other expensive resource, and not as a business overhead, is a "Major First Step" to improving energy and environmental efficiency and reducing costs. Energy management is a complex tool that can provide enterprises with cost savings due to the implementation of a competent energy policy for the use of energy resources.

The state of the domestic industry can be characterized by backwardness in comparison with the countries of the West. The most important reason for the backwardness of the domestic industry is that the leadership of the Soviet Union gave instructions to develop the northern, eastern and central regions of Russia. Such actions led to the technological backwardness of industrial enterprises of Ukraine and, in accordance with the urgent need for energy conservation.

Traditionally, the management of the enterprise pays more attention to the urgent needs of production, and not at all to the efficiency of energy use, which is considered a technical problem, not a managerial one. At the same time, management of any resources, including energy resources, is a scientific process and a vital necessity for every enterprise. Not being a specialist in the field of energy, not having an idea of energy management, a manager without special training is unlikely to be able to understand and support the implementation of an unfamiliar energy efficiency improvement system.

It is necessary (at a minimum) to have reliable information about the actual state of energy services of enterprises, to analyze and summarize it in order to form one's position and relevant proposals.

Industrial enterprises are an energy-intensive sphere of production, in which, as a result of physical and moral wear and tear of fixed assets, there is a significant increase in the consumption of energy resources [22]. The continuous growth of costs for energy resources causes an increase in the cost of production, which determines the necessity and importance of reducing the energy component in production costs. One of the determining conditions for reducing costs at industrial enterprises and increasing the economic efficiency of production as a whole, and therefore the cost of manufactured products, is the systematic modernization of the production process with the simultaneous implementation of energy-saving measures at the enterprise.

At the same time, enterprises are weakly interested in the development and implementation of energy saving programs, which is caused by the lack of economic incentives and energy saving mechanisms, limited financial resources. As a result, there are no energy

saving programs at the enterprise, or they are being developed formally. At the same time, the energy-saving way of development of the domestic economy is possible only with the formation and further implementation of energy-saving programs at individual enterprises, for which it is necessary to create an appropriate methodological and methodical base. Postponing the implementation of energy-saving measures causes significant economic losses to enterprises and has a negative impact on the general ecological and socio-economic situation.

In addition, the further growth of costs in industry is accompanied by a growing deficit and an increase in the cost of financial resources, which restrains the renewal of the enterprise's production base in comparison with the achievement of scientific and technical progress.

To prevent financial losses during the formation of a set of energy-saving measures, it is necessary to develop and improve methods for evaluating the effectiveness of energy-saving programs that take into account the multivariate use of investment sources intended for their implementation. Reducing the energy component in production costs will allow to obtain additional funds to ensure an acceptable level of moral and physical wear and tear of technological equipment.

Energy management is considered by Western researchers as a process whose goal is to develop a plan for the most profitable energy consumption and ensure optimal management of energy use. In addition, it represents a comprehensive approach to solving general energy problems of the organization, such as minimizing energy costs, achieving reliable energy supply, reducing energy consumption, assessing the greatest efficiency and applying energy experience in everyday work [23].

In addition, in order to obtain the maximum energy-saving effect at industrial enterprises, the energy-saving program should consist of a set of targeted measures. For this, it is necessary, on the one hand, to classify the objects of energy saving of the enterprise and to determine their technical and economic indicators, and, on the other hand, to identify the system of factors affecting energy saving. The identified system of factors will allow designing a unified economic model of energy saving of industrial enterprises. At the same time, the economic

efficiency of the developed model is of great importance, which is determined in each specific case taking into account the specifics of the technological process at various stages of production. For these purposes, it is advisable to define energy saving zones of the enterprise: main and auxiliary production., preparation, modernization and maintenance of production, logistics operations and non-production sphere of the enterprise. Taking into account the characteristics of the listed zones, it is necessary to implement an energy-saving program of the enterprise.

It should be noted that there are some tools in Ukraine that deal with the analysis of energy efficiency and develop measures and provide recommendations for its improvement.

The Institute of Renewable Energy of the National Academy of Sciences of Ukraine (IRE of the National Academy of Sciences of Ukraine) was created as part of the Department of Physical and Technical Problems of Energy of the National Academy of Sciences of Ukraine with the aim of further development and coordination of research in the field of renewable energy sources and ensuring the use of their results in order to implement the Resolution of the Presidium of the National Academy of Sciences of Ukraine No. 299 dated 10.12.

In addition to the indisputable scientific authority and leadership positions in the field of scientific developments and the expansion of the use of renewable energy sources in industry, the communal sphere and agriculture, the Institute of Scientific Research of the National Academy of Sciences of Ukraine is a co-founder of the Department of Renewable Energy Sources at the National Technical University "KPI", taking an active part in the training of highly qualified specialists industry. The Institute initiated the development of the Project and is the first institution of the National Academy of Sciences to act as a co-executor of the UNIDO-GEF technical assistance project.

To ensure energy saving at enterprises, it would be advisable to:

- comprehensive application of economic incentives;
- determination of funding sources and directions;
- creation of a base for the implementation of economic measures, the use of the system of state standards when determining the size of

the provision of economic benefits and the application of economic sanctions;

- introducing a fee for the irrational use of PER;

- provision of subsidies, grants, tax, credit and other benefits to legal entities and individuals for stimulating the development, implementation and use of energy-saving technologies.

The efficiency of energy saving in production is achieved with the increase in the use of the existing energy capacities of the enterprise, the renewal of fixed assets, the use of effective management, the introduction of modern less energy-intensive production technologies, the use of new types of energy and energy carriers. The transition to new sources of energy is due to a significant reduction in exhaustible energy reserves in the world and in Ukraine in particular.

From the point of view of energy saving and compliance with the energy, and therefore economic efficiency of production, the volume of production for enterprises will be optimal, for which the marginal expenditure of energy resources for its production is equal to the marginal energy value of the produced products. This means that in the production process, the increase in energy consumption is justified as long as they do not exceed the energy value of the products obtained from their use, which will ensure the competitiveness of the company's products.

The benefit of effective energy saving is confirmed by world experience, research results, and practice.

On a global scale, energy saving benefits everyone:

- it brings improvement of the environment and living conditions to the population (increase in real incomes, new jobs);

- to the state - expansion of the tax base, reduction of capital and current costs, increase of income;

- producers - profit growth, production loading, etc.;

- investors - projects and contracts with a low degree of risk;

- energy supply organizations - reduction of the share of energy production volumes on less efficient equipment, reduction of the need for installation of new installations.

Increasing energy efficiency at the enterprise increases the enterprise's income and, at the same time, brings the following results [24, p. 430]:

- saving money, which ensures the growth of the enterprise's competitiveness, especially in the case of rising energy prices;
- increase in the level of profitability of the enterprise;
- increase in productivity due to improvement of production processes related to the method of energy use;
- release of funds for business development, investments in the social sphere;
- establishment of emission quotas, which makes it possible to reduce dependence on energy prices, reduce company risks, which, in turn, increases the value of the enterprise;
- reduction of emissions into the environment, due to which the environmental condition improves, and with it the image of the enterprise.

The main measures in the field of energy saving at enterprises include [24, p. 431]: the need to account for consumption in the most energy-intensive sectors of production; more efficient utilization of energy; reducing the level of reactive power consumption due to the establishment of compensatory means; increasing the efficiency of fuel use; the use of various alternative types of fuel, namely gas and waste; introduction of automatic tools for monitoring, managing the distribution and use of energy carriers in production; control over the consumption of electricity for lighting, implementation of economical lighting systems; reduction of fuel and thermal energy losses due to improved sealing of thermal equipment; repair of thermal insulation using modern thermal insulation materials; implementation of modern temperature control systems; replacement of metal pipes with plastic ones in water, heat and gas supply systems, etc.

A similar approach should be adopted by organizations and enterprises when planning and managing energy use. Organizations must play an active role in supporting government initiatives and aligning their internal policies so they can thrive in the new energy market.

Let's take a closer look at the reasons why organizations need to consider energy management as an integral part of their daily activities and plans for the future:

1. Reduce costs while seizing opportunities for future growth

Growth is inevitable, and with this growth comes the problem of energy management. If we continue to conduct business as usual, the cost of energy is expected to increase even more due to factors such as tariff increases, reduced equipment performance, and additional operational requirements (such as increased occupancy or changes in work schedules).

Growth may also require infrastructure upgrades, such as additional transformers or utility connections, which will incur additional costs. Energy management makes it easier to use saved energy costs for future investments and supports the best growth opportunities for any organization.

2. Risk reduction

As countries continually set higher energy efficiency targets, it is expected that there will come a time when energy management will no longer be an option but a requirement. It is expected that energy regulations will evolve and high energy performance will become the standard.

The cost of energy is heavily subsidized in the Gulf states. The electricity tariff is expected to gradually increase until it eventually equals the actual cost of energy. Tariff increases are a major risk factor for organizations to remain profitable and to thrive in their business. The electricity tariff increased in January 2017 in Abu Dhabi from 16 charges to 20 charges per kWh for the commercial sector and to 29 charges per kWh for the public sector. Similarly, the tariff in Saudi Arabia increased last year from 26 gal to about 30 gal per kWh for the commercial sector. These increased tariffs create a greater challenge for organizations to manage their energy costs.

Energy management can also improve the reliability and sustainability of the power supply. Reducing peak demand and preventing power outages can be one of the benefits of an energy management program.

3. Energy efficiency ratings and improved branding

Organizations that are more responsible and impactful of energy consumption are better placed to position their brand in the marketplace. Green products or services are considered to be more popular and considered as a marketing tool.

Dubai will introduce an energy efficiency rating for existing buildings, which will certainly influence the preferences and behavior of tenants. Owners of buildings with a poor energy efficiency rating will have no choice but to compromise or provide additional benefits that add value to their buildings. Such ratings will influence trends in consumer behavior and the competitiveness of buildings.

4. Standardization and rules

When Estidama was launched in 2010 and Pearl's building grading system became mandatory, Abu Dhabi's construction industry was shattered. The standard has not only impacted building materials and the supply chain, but has also impacted industry practices and stakeholders.

Similarly, energy efficiency standards and labels such as the «Energy Efficiency Standards and Labeling (EESL)» program of the Emirates Standards and Metrology Authority (ESMA) have imposed energy efficiency requirements on manufacturers and importers of home appliances. All new appliances must meet minimum requirements and be labeled for their energy efficiency.

A similar case was presented in Saudi Arabia when the Saudi Standards, Metrology and Quality Organization (SASO) introduced a similar energy labeling program.

5. Other benefits

Energy management can bring many other benefits such as:

Environmental benefits such as reduced environmental impact and carbon emissions.

Improving the quality of life and improving health, such as improving indoor air quality,

Can be used as a management tool for benchmarking and tracking the performance of production or services.

Expansion of purchasing activities through an in-depth assessment of the competitiveness and impact on the life cycle of various items or products (especially during system upgrades).

All these consequences further lead to an increase in the competitiveness of the enterprise. Thus, it can be argued that there is a direct relationship between energy efficiency and competitiveness.

Solving the problem of energy saving and increasing energy efficiency can only be done comprehensively with the help of: carrying out an energy survey to determine the efficiency of energy use and energy saving potential; implementation of the energy management system; development of a program of measures to improve the efficiency of energy use, implementation of the program; monitoring and confirmation of the effect of the implemented energy saving measure.

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