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**PROJECT MANAGEMENT OF ENERGY SAVING:**

**UKRAINE AND THE EU**

A comparison of the European experience in the implementation of energy-saving programs indicates the need for radical steps. This concerns the development of complex organizational and economic mechanisms for managing energy saving projects in Ukraine and their further implementation. The existing energy saving management system does not meet modern requirements and requires further improvement. Therefore, there is an urgent need to study the management system in the implementation of energy-saving technologies in the construction industry. The issue of comparative analysis of energy saving project management in Ukraine and the EU is particularly important. This issue is becoming more and more relevant every year in the context of rising energy prices and tariffs.

The implementation of the energy saving project is carried out with the cooperation of all participants. In particular, these are state bodies; the customer; the organization financing the project; contractors (design, construction and other organizations). Coordination of actions for the implementation of the each project phases are carried out by management.

Consider the existing definition of the term "project management". This definition can be interpreted as the ability of management to manage human and material resources throughout the life cycle of the project. The main objective of project management is to achieve the energy saving results envisaged by the project. Such results are the composition and scope of work, cost, time of implementation of the project results and its quality, motivation of project participants.

The life cycle of an energy-saving project is the period of time between the moment of its inception and the moment of its liquidation. The life cycle of the project is divided into the main activities (investment research, project planning, development of design and estimate documentation, tendering and Contracting, construction and commissioning, project commissioning, project operation, project closure) and its provision (organizational, legal, personnel, financial, logistical, marketing and information). The duration of the project life cycle is determined by the volume and complexity of the work of its individual phases, which are a kind of mini-projects with new goals and limitations. The duration of the conceptual phase of the project is 3% of the total time, the planning phase – 5%, the design phase – 20%, the construction phase – 60%, the final phase – 12%. The complexity of the project is gradually increasing in the first three phases, increases sharply in the construction phase and decreases in the final phase. The main phases of the project life cycle and their duration depending on the type of construction are given in table 1 [1].

Table 1– Project Life Cycle Phases

|  |  |
| --- | --- |
| Type of construction | The duration of the project, years |
| Conceptual phase | Contact phase and detailed design | Construction |
| Private sector |
| Residential building | 0,5-6 | 0,5-4 | 0,5-1,5 |
| Industrial facility | 0,5-2 | 0,5-2,5 | 0,5-2 |
| Commercial building | 1-10 | 1-4 | 0,5-3 |
| Public sector |
| Residential apartment buildings | 1-4 | 1-3 | 1-4 |
| Large business buildings | 1-7 | 1-3 | 1,5-2,5 |
| Small and medium-sized buildings | 0,5-3 | 0,5-2 | 0,5-1,5 |
| Educational institution | 1-4 | 0,5-3 | 0,5-2,5 |
| Medical institution | 1-5 | 0,5-4 | 0,5-5 |
| Roads and harbours | 1,5-10 | 1-4 | 0,5-3 |
| Water supply and Sewerage facilities | 1-4 | 0,5-3 | 0,5-2,5 |

The experience of European countries shows that in a market economy it is impossible to achieve results in the management of energy saving by market mechanisms alone. These energy saving mechanisms should be combined with the use of administrative and organizational measures systems (the creation of conditions for free competition and the adoption of antitrust laws; the establishment of special norms and energy standards for energy-saving equipment, the efficiency of electrical and industrial equipment; the unification of all services for the supervision of the use of power plants, equipment and resources themselves into one independent body; the organization of legal regulation of energy saving through the consolidation in legislative acts of economic and administrative measures in the management of energy saving; the organization of trust funds for energy saving). Tasks and functions of the state management of energy saving are carried out by means of the corresponding control elements (Fig. 2.) [1]. These are development and implementation of pricing policy, certification of equipment and instruments, energy assessment of projects, licensing of consulting and auditing firms, decisions regarding the provision of tax and credit incentives, development of energy standards.

Виробники і постачальники палива та енергії

Виробники енергетичного обладнання та приладів

Проектно-конструкторські і технологічні організації

Консалтингові та аудиторські фірми

Інвестори

Контроль палива та енергії

Елементи державного управління

Ціни, тарифи

Сертифікація

Експертиза

Пільги податкові та кредит

Інспекція, стандарти та нормативи

Проекти енергозбереження

Споживачі палива та енергії

Fuel and energy manufacturers and suppliers

Manufacturers of power equipment and devices

Design and technological organizations

Consulting and audit firms

Investors

Fuel and energy control

Elements of public administration

Prices, tariffs

Certification

Examination

Tax and credit benefits

Inspection, standards and regulations

Energy-saving projects

Fuel and energy consumers

Figure 2 – Block diagram of energy saving management

Experience of implementation of energy saving programs in the European countries indicates the need for the development and implementation of integrated governance arrangements and implementation of energy efficiency projects with the aim of improving competitiveness and economic growth. The components of the energy saving project management mechanism are shown in figure 3.

Mechanisms of project management of energy saving

Legal regulation

Administrative management

Administrative and environmental instruments

Development of energy saving infrastructure

The tools of social actions

Information management tools

Figure 3 – Components of the energy saving project management mechanism

In European countries, recently the requirements of regulatory documents to the level of thermal protection of houses have been revised, which increase with each new edition. Abroad, the problem of energy saving is solved comprehensively, by reducing the energy consumption of all built and under construction houses. The best results are achieved by increasing the thermal qualities of all external fencing of buildings: walls, coatings, floors, window openings filling. In Europe, energy saving has long entered the lives of citizens, commercial enterprises, is the policy of local and state authorities. Regulatory, energy efficiency and energy management strategy is defined in EPBD Directive 2010, ISO 50001, DIN V 18599-2 [2 – 4] and many other documents. Energy efficiency assessment is demonstrated by an energy certificate-a certificate with a specific energy efficiency class. The EPBD Directive adopted the term "energy efficiency class". The European Union has established seven energy efficiency classes (A, B, C, D, E, F, G): class a corresponds to maximum energy efficiency, and class G – minimum. Some countries establish additional energy efficiency classes A +, B + +. According to the EPBD, by 2020 all buildings and goods in Europe must meet class a [4].

Another concept for improving energy efficiency and managing energy-saving projects is accounting for different energy costs in financial analysis.

When forming an effective energy saving project management system in Europe, the Foresight method is used. This method allows the selection of project management programs from a comprehensive perspective to identify the problem and critical areas of the future, to determine the existing factors affecting the formation of development strategies, to organize an expert group. The set of approaches used in foresight projects is constantly expanding and covers dozens of methods today. Among the most productive are Delphi, Key Technologies, Scenarios, Technology Roadmapping, Expert Panels, Cross-Impact Analysis, SWOT-Analysis, Futures Workshops. A set of methods used in a particular energy saving project can be selected taking into account many factors: time and resource constraints, the availability of a sufficient number of highly qualified experts, access to information sources and others [5].

**References**

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