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ENABLE – Empowered Civil Society for a Sustainable and Efficient City

RESEARCH ABSTRACT

International experience in
organising and financing energy modernisation
of multifamily residential houses



This project is implemented:

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The European Union is an economic and political union of 27 European countries. It is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights, including the rights of persons belonging to minorities. It acts globally to promote sustainable development of societies, environment and economies, so that everyone can benefit.

INTRODUCTION

Case study

"International experience in organising and financing energy-efficient modernisation of multi-family residential buildings"

Relevance of the study

Energy efficiency is the rational use of energy resources (efficiency = benefit / costs; benefit: useful energy or energy service). Energy efficiency implies the effective use of all types of energy, which leads to increased comfort for residents and reduced costs. Modern technologies are used to improve the energy efficiency of multi-family buildings. However, in the Republic of Kazakhstan, the majority of the housing stock consists of old panel and brick buildings, which are typical of Soviet minimalism.

In the past, these houses offered families access to their own homes at relatively low energy prices, which reduced the importance of energy consumption. Over time, the gap in energy consumption between old and new houses has become increasingly noticeable. The time has come for energy-efficient modernisation.

What methods should be preferred when carrying out energy modernisation of residential buildings constructed in the last century? To find the answer to this question, we can study the experience of other countries to avoid repeating mistakes.

Objectives of the study

To actualise the experience of energy-efficient modernisation of the housing stock for further development of the most acceptable solutions in the housing sector of the Republic of Kazakhstan.

Tasks of the study

- Studying the main approaches to energy efficiency in residential buildings.
- Studying the main technical solutions and financial instruments used in organising energy-efficient modernisation.
- Studying the main approaches to working with homeowners in multi-family buildings.

Scope of the study

experience in organising and implementing energy-efficient modernisation of the housing stock, in particular:

- best practices in the adoption, implementation and enforcement of energy efficiency standards and energy-efficient technologies for the housing sector at national and local levels;
- public relations developing in the process of implementing energy-efficient modernisation of the housing stock.

Subject of the study

The subject of the study is the energy-efficient modernisation of residential buildings.

Final form of work

Written report (full report in Russian).

Authors of the study

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RESEARCH ABSTRACT

International experience in organising and financing energy modernisation of apartment buildings

Updating the experience in organising and carrying out energy efficient modernisation of the housing stock is of great importance for developing optimal solutions to select financial instruments aimed at improving the energy efficiency of apartment buildings in the housing sector of the Republic of Kazakhstan, especially taking into account the fact that the main share of the housing stock in the country is made up of old panel and brick buildings embodying the Soviet period of construction.

In the context of global climate change, ageing housing stock and limited financial resources of both the state and owners of residential premises, efficient use of energy becomes not just desirable, but necessary. This not only helps save money, including when paying for utilities, but also significantly reduces the carbon footprint, which meets modern global environmental requirements.

Modernisation of residential buildings allows the introduction of advanced technologies and materials that increase thermal insulation and provide the use of alternative energy sources. This approach improves the quality of life of residents, reduces the risk of various diseases due to low comfort levels, and contributes to the creation of a more sustainable urban infrastructure.

In addition, the exchange of experience and the development of common standards of modernisation contribute to improving the skills of specialists and building trust among consumers, which ultimately ensures not only the satisfaction of current needs, but also the sustainable development of the country's housing sector in the future.

However, in conditions of limited financial resources it is necessary to investigate what methods should be preferred when carrying out energy modernisation of residential buildings constructed in the last century? What are the most acceptable solutions that can be used in the country? And in order to avoid repeating the mistakes made in other countries when planning and carrying out energy modernisation, it is necessary to study international experience in organising and financing energy modernisation of apartment buildings.

For the researcher it is important to analyse not only the main approaches to energy efficiency of residential buildings, the main technical solutions and financial instruments used in organising energy efficient modernisation worldwide, but also to evaluate the main approaches in dealing with owners of premises in apartment buildings.

Social relations formed in the process of implementation of activities on energy efficient modernisation of the housing stock are a complex and multifaceted process involving interaction of various actors - the state, the private sector, citizens, as well as public organisations (NGOs).

In the context of global climate change and the growing need for sustainable development, energy efficiency is becoming a key element in the strategy for modernising the housing sector.

The process of modernisation is not limited to technical aspects such as the installation of modern thermal insulation systems or energy-saving equipment. It also involves changes in legal regulations, economic incentives, and educational initiatives aimed at raising public awareness of the importance of rational energy consumption.

The joint efforts of all participants - from developers to end users - play an important role in the implementation of projects aimed at creating comfortable and safe urban environments. Thus, modern social relations surrounding energy efficient modernisation become the basis for shaping a sustainable future.

To address the concerns of the Kazakh target group, for whom this study is conducted, regarding the perceived impossibility of implementing large-scale energy modernisation of the housing stock in the near future, the study includes a section on the **history of energy-efficient modernisation of residential buildings as a mass phenomenon**. The research analyzes that the development of a national model for housing modernisation was preceded by various prerequisites — historical, political, technological, and others. Each country has followed this path in its own way and at its own pace. There is nothing inappropriate about Kazakhstan beginning this journey today. On the contrary, it is important to move forward without fear, with confidence and determination.

Despite the existing problems and challenges, further development of energy saving and modernisation of residential buildings promises to create more sustainable and efficient housing conditions for future generations. It is important to continue an active dialogue between all stakeholders to achieve common goals in the field of energy saving and sustainable development of energy saving technologies.

The main approaches to energy efficiency in residential buildings include the use of modern technologies, optimisation of building materials and the introduction of renewable energy sources. The study analyses the main of these, with the aim of obtaining more efficiency for less money. It concludes that it is necessary to maximise energy savings while maintaining an economically viable level of investment costs for homeowners.

To begin with, it is important to focus on insulating the building envelope, which significantly reduces heat loss. The use of high-performance windows with a low thermal transmittance coefficient also plays a key role in maintaining a comfortable indoor climate.

The next step is the implementation of smart management systems that automate heating and lighting processes based on the time of day and human presence. Energy-saving bulbs and appliances that meet energy efficiency standards help reduce electricity consumption.

Of course, the use of solar panels and rainwater harvesting for household needs opens up new horizons for sustainable housing development. After all, a comprehensive approach to energy efficiency should consider not only resource savings but also the improvement of residents' quality of life by creating comfortable and environmentally friendly living spaces.

The key findings of the research section **Main Approaches to Energy Efficiency in Residential Buildings** are as follows:

- a) Political will and determination are the main driving forces for improving energy efficiency in the housing sector.
- b) Raising public awareness about energy consumption is the first step toward energy saving and the energy modernisation of housing.
- c) Major renovation should apply to the entire building.
- d) Residents should be aware of their energy consumption and monitor their energy bills.
- e) The renovation of existing buildings is characterised by long payback periods and therefore requires additional government incentives.
- f) Investments in energy modernisation must be economically justified.
- g) Each condominium apartment building needs a property manager.
- h) During the transition period, government support measures play a crucial role.
- i) To improve the energy efficiency of their housing sector, countries with transitional economies need information, motivation, expertise, capacity, technology, and funding.

The study recommends a specific sequence of actions for the Government of the Republic of Kazakhstan in order to establish the framework conditions for large-scale energy modernisation of the housing sector in the country.

Engineers' views on the **key technical solutions** for achieving building energy efficiency vary. In today's world, the energy efficiency of a residential building is not just a matter of modern technologies, but also deep understanding of the nature of the interaction between humans and the environment.

Each element of the structure, from insulation to heating and ventilation systems, becomes part of a balanced process where resources are optimally distributed. Thus, the engineer, by employing interdisciplinary approaches and the latest developments, creates a space where comfort, energy savings, and sustainability become integral attributes. A residential building, in this way, transforms into an asset that protects nature, reduces utility bills, and improves quality of life. However, as already mentioned, there is a basic set of technical solutions that are primarily used by engineers and architects from different countries around the world. A list of such technical tools is published in the study (Table 1, page 11 of the full report, which includes a description of key energy-saving measures).

When introducing new policies, including those related to energy conservation, various barriers inevitably arise. **The identified barriers to the introduction of energy saving technologies** are an important part of the study.

These barriers include legislative constraints, environmental issues, energy resource availability and costs, as well as economic obstacles to adopting energy-efficient technologies. For example, when modernising the stock of apartment buildings, improper application of proper technology in energy renovation of buildings can cause problems related to moisture and mould formation. Media coverage of such poor renovation practices has a strongly negative impact on public perception and decision-making in favor of energy modernisation.

When developing the framework conditions for energy-efficient modernisation of residential buildings, all the barriers to modernisation described in the study should be taken into account.

The energy modernisation of residential buildings represents a key aspect of sustainable development and efficient resource use. However, this aspect often lacks adequate funding. **The main financial instruments** supporting this process include government subsidies, tax incentives, and various program initiatives. An analysis of the instruments in use demonstrates the high effectiveness of existing financial and investment schemes for energy efficiency, which are widely implemented across European countries. The main types of these financial instruments are described in detail in the study.

Government subsidies play a vital role by providing residents with access to funding for high-efficiency technologies such as thermal insulation, solar panel installations, and smart energy metering systems. Tax incentives allow homeowners to reduce their tax liabilities when investing in modernisation, creating additional motivation to improve energy efficiency.

It is also important to highlight the availability of loan programs developed by both banking institutions and specialised funds, offering low interest rates and flexible repayment terms. The implementation of "green" financing schemes, which involve compliance with environmental standards, adds another layer of support for investments in sustainable energy. Thus, a comprehensive approach to financial instruments helps accelerate the transition to an energy-efficient future.

The study recommends focusing on two main types of financial instruments: long-term loans and subsidies in various forms. A key principle must be upheld: the greater the energy savings, the more substantial the financial support.

For Kazakhstan, **international experience in implementing financial instruments for the energy modernisation of residential buildings** is also of great importance. The study provides examples of how these primary types of financing are utilised across different European countries.

An important aspect is the establishment of a financing mechanism for joint initiatives, such as public-private partnerships. This approach not only attracts additional resources but also allows for risk-sharing, which is especially relevant for large-scale projects. The application of international standards and

regulations, such as the Kyoto Protocol, contributes to harmonising approaches and attracting a broader range of investors.

In certain countries, eligibility for financial support is determined not only by the level of energy efficiency achieved but also by income levels (energy poverty), thereby incorporating social aspects into the criteria.

A major challenge for many post-Soviet countries, including Kazakhstan, lies in the fact that, as a result of mass privatization, many homeowners still feel responsible only for their individual apartments and not for the maintenance of common property (such as basements, entrance areas, roofs, façades, etc.). Therefore, the study analyzes how specific support strategies and programs with a focus on multi-apartment buildings are implemented in Eastern European countries.

Naturally, there are also obstacles to the implementation of financial instruments. **The identified barriers to the adoption of financial tools** have also been analyzed and included in the study.

For example, a lack of information and awareness among homeowners about the available opportunities and benefits of modernisation often results in reluctance to participate in such initiatives. Complex financial models and the absence of accessible credit resources further hinder the investment process.

In addition, legal and administrative barriers – such as an underdeveloped legislative framework or bureaucratic procedures – significantly complicate project implementation. A lack of coordination between government bodies, the private sector and residents also slows down the progress.

Finally, financial risks related to economic uncertainty and fluctuations in energy tariffs create hesitation among potential investors. Overcoming these obstacles through a comprehensive approach and the development of effective strategies is essential for the successful implementation of such programs.

The study analyzes the main legislative barrier to establishing financial instruments for the energy renovation of condominiums in Kazakhstan.

This barrier lies in the inadequacy of the current legal framework for the establishment and management of condominiums. The study proposes adopting alternative approaches – specifically, those used in continental law countries, including most European Union member states and certain post-Soviet countries. In these regions, financial instruments for the energy modernisation of existing housing stock operate effectively, based on a more advanced legal model of condominium ownership and governance.

The study also analyzes the reasons why homeowners are reluctant to make the decision to start energy modernisation of their buildings. Based on this analysis, **key approaches are proposed for working with the population in Kazakhstan when preparing decisions on choosing an energy-saving modernisation model for housing**. The study explores what civil society organisations (CSOs) can do to address these challenges in the current situation and offers a strategy of action.

This involves providing basic knowledge to the owners of multi-apartment building units and establishing special communication channels with residents. The study includes an example of a plan for working with homeowners of multi-apartment buildings and a sample survey questionnaire for residents of multi-apartment buildings, presented as separate inserts in the research.

The study is structured in a sequential and logical manner. If you have financial instruments for modernisation, have overcome all the barriers described in the research, and received the consent of the building owners, the next step is the need to choose contractors for the modernisation. Therefore, the study includes a final section titled **"Key Approaches to Selecting Specialists for Organizing Energy Renovation"**.

The three main groups of specialists you will need are the construction contractor, the energy consultant, and the manager. The study provides a detailed description of the functional responsibilities of each, their

Strengthening the capacity of CSOs to increase their participation in decision-making for supporting the development of sustainable housing with a focus on energy efficiency of buildings

areas of responsibility, and offers recommendations on communication between the client of the modernisation project and the group of specialists.

The study concludes that in matters of energy-efficient modernisation, everything depends on the professional qualities of the three mentioned groups of specialists and the communication skills of the qualified manager with the property owners. The more capable and knowledgeable the manager is, and the better they can collaborate with the owners in a trusting manner, providing them with information, the higher the guarantee of success.

Thus, with this study as a guide to action, you, dear reader, now also possess the essential skills of an organiser for energy-efficient modernisation of residential buildings. You are aware of the obstacles to energy efficiency, and you are capable of overcoming them!

The team of researchers behind the ENABLE program wishes you success on this journey!

European Union project ENABLE

Project Goal

Strengthening the capacity of civil society organisations (CSOs) to increase their participation in decision-making to support the development of sustainable housing with a focus on energy efficiency of buildings.

Project Objectives

- to improve the knowledge of CSOs on sustainable housing
- to increase the capacity of CSOs to educate and inform citizens to raise public awareness
- to improve co-operation between CSOs and local authorities in the field of sustainable housing, in particular energy efficiency in buildings and energy-efficient modernisation of multi-family buildings (MFBs)

Implementing Partner in Germany

Housing Initiative for Eastern Europe (IWO e. V.), Berlin, www.iwoev.org

Implementing Partners in Kazakhstan

Almaty City Association of Apartment Owners' Cooperatives (ALMATY ASSOCIATION), Almaty, <https://gkhsp.kz>

Kazakhstan Parliamentary Development Fund (KPDF), Astana, <https://clck.ru/38Ui8y>

Петропавловская региональная ассоциация КСК, г. Петропавловск, <https://clck.ru/QtEDY>

Current information on the website: <https://enablepro.kz/>

