

Recommendations on energy efficiency in Belarus

Developed by the partners of the ARCEE project,
considering the research performed by other
organizations

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Glossary

ARCEE	Awareness Raising Campaign on Energy Efficiency
ESCO	Energy Service Company
EU	European Union
GDP	Gross Domestic Product
IEA	International Energy Agency
MEPS	Minimum Energy Performance Standards

1. Introduction

Issue of energy saving and decrease energy intense of GDP is one of the most important in energy policy of the Republic of Belarus. Since 90's many progressive system elements were created: legislative framework, institutional structures, mechanisms of state support and incentives, a lot of government programs with monitoring of their implementation. Nevertheless, there are enough problems that need to be solved. Most of them exist due to inefficient management system, undeveloped competition, lack of knowledge on the issue. To make further progress it is necessary to coordinate the efforts of all stakeholders.

Many national and international organizations are working on the topic of energy efficiency in Belarus, doing independent research and providing practical recommendations on national and local levels. In the context of the ARCEE project, a research on existing recommendations has been conducted in order to avoid duplication. This paper is mainly based on recommendations developed by the partners of the ARCEE project from own experience and observations, but also includes the review of existing recommendations, developed by other organizations. To keep the paper concise, only those recommendations, which are regarded by the ARCEE project as the most crucial and realistic for implementation are presented in the paper. A list of the used documents can be found at the end of the paper.

2. Preconditions necessary for implementing energy efficiency projects in Belarus

It's important to notice that compared to other post-Soviet republics Belarus puts much effort in increasing energy efficiency since 1998 (when the Law on Energy Saving was adopted) and especially since 2007 (when the President's Directive on Savings and Thrift was adopted). A special State Committee on Energy Efficiency and Control of the Republic of Belarus was created (now it's the Department on Energy Efficiency under the State Standardization Committee) to coordinate development and implementation of regional and sectoral programs on energy saving each 5 years. Considerable progress was achieved – GDP intensity of Belarus decreased from 690 kg of oil equivalent per 1 thousand USD of GDP in 1990 to 240 kg of oil equivalent per 1 thousand USD of GDP in 2012, but implemented activities mostly address industry and energy sector.

In order to achieve progress on energy efficiency in Belarus, a lot of reforms have to be implemented in the country. The following aspects are highlighted as particularly important:

- legislative and institutional changes including reform of energy tariffs and improved possibilities to finance energy efficient modernization,
- technical reforms,
- educational programs for specialists dealing with energy efficiency issues at all levels,
- awareness raising campaigns on energy efficiency for broad public,

Effective development of strategies and action plans for increasing energy efficiency in housing sector in Belarus requires **reliable statistic information**. Current energy efficiency indicators include consumption of fuel, oil products, heat and electricity per unit of production (works, services) and losses of heat and electricity in grids, no reliable statistic data about energy consumption in buildings of different types per square meter is available. The partners of the ARCEE project find it extremely important to improve the availability and reliability of energy statistics in Belarus, in order to facilitate the development of effective energy efficiency indicators. The statistical database of the IEA can serve as a good example for the development of statistical data templates and the layout of tables.

One of the conclusions of the research conducted in the frame of ARCEE project is that it is necessary to eliminate cross-subsidies and state support of energy costs for population, which does not motivate people to engage in energy efficiency and reduces the competitiveness of Belarusian enterprises. The system of energy tariffs for the population, businesses and industry should promote the most effective and efficient way of their consumption, and increase the use of renewable energy sources and secondary energy. The process of changes has started, but there is a lack of information and public involvement – inhabitants are just informed about step-by-step increase of tariffs with no supportive information how to get prepared for further increase.

3. Legal and institutional changes

Energy efficiency is one of the key focus of the state energy policy of the Republic of Belarus, but it is obvious that legislation framework still does not provide necessary preconditions for effective promotion of energy efficiency at all levels. The ARCEE experts consider the following action to be crucially important:

- Cutting subsidies for energy prices for population and at the same time providing support to vulnerable social groups

Energy tariffs for population, in Belarus both for heat energy and electricity have been strongly subsidized in the past decades, so that the costs - and consequently the incentive for the inhabitants to save energy - have been rather low. The subsidies have to be gradually removed, relocating the money instead to subsidizing energy efficient measures. This will provide benefits, although posing risk of poverty to particular social groups (pensioners, single parents, low income people). Therefore the reforms related to phasing out of energy subsidies shall be accompanied by targeted support programs for vulnerable groups of the population in order to protect them from poverty.

- Establishing legal framework for operation of revolving funds and Energy Service Companies (ESCOs) in housing sector

It is vitally important to develop the concessional lending to individuals and businesses of different forms of ownership for implementation of energy efficiency measures with the help of revolving funds. It is necessary to create favorable conditions for the operation of energy service companies (ESCO) in various fields of activity, particularly in the housing stock and the construction sector. Their services must be available to organizations of different forms of ownership and activities. The main advantage of the ESCO is an attraction of private investments and loans, energy efficiency increase without high additional costs to the customers.

- Broadening the practice and increasing the quality of energy audits

It is necessary to increase the quality of energy audits and to use it more extensively (not only for big industrial enterprises, but also for housing sector). It is necessary to develop standardized methods for evaluation of energy efficiency in buildings, its equipment and devices which can serve as a basis for decision making about their further reconstruction, purchase and \ or replacement (for equipment and appliances). Report on the results of the energy audit must necessarily include an economic payback analyses for the recommended energy saving measures. ARCEE project suggests introducing legal and financial responsibilities of energy auditors for their calculations of pay-back and savings and responsibilities of customers of energy audit service for qualified implementation of measures recommended by the energy audit. In case of failure to reach the estimated indicators for energy consumption reduction and payback because of the low-quality calculations, it is necessary to suspend the license of energy auditing organization. Another option- the audit organization must reimburse all losses to the

customer (compensation of customer's credit liabilities for energy audit services). In the case of low-quality implementation of the recommended measures and confirmation of correctness of the calculations made by energy auditing organization, the customer of energy audit services must bear all related losses. These measures can significantly increase the quality of the energy audits and implemented energy saving measures.

- Applying higher energy standards for buildings and quality assurance programs during refurbishment and construction.

All buildings and structures (except historical, religious, temporal and small) must meet the requirements on energy efficiency, both at the time of putting into operation and during operation of a building. Requirements on energy efficiency in buildings should be regularly reviewed with preliminary notification of the planned regulations so that the designing, construction and housing companies have time to be prepared for the next toughening of standards.

The quality of construction (and assumedly of refurbishment) in Belarus as observed during the ARCEE pilot project can be very low. The need for cheap "mass" housing is declared by the government, so the outdated construction materials and technologies like panel construction are used. There is a lack of integrated process during construction - no direct communication between all involved stakeholders - the developer, architects, shareholders, construction company and quality control bodies. Both accepting committee and committee effectuating expertise during warranty period act after end of the construction or refurbishment, so the residents' interests are not represented during the construction process. Therefore ARCEE project suggests introducing **Quality Assurance Program** that can ensure that quality is "built in" at the front end rather than at the back end of construction or refurbishment project. This means to create an independent Quality Assurance Group of experts from the very beginning of the project, which will be responsible for:

- proof of heating energy index of the building,
- control correspondence with air-tightness requirements,
- coordinate development of planning documentation,
- and inspect the works that were carried out

Quality issues should also be included in the standard contracts for construction and refurbishment: construction company should guarantee the specified energy standard, minimize thermal bridges and promote airtight construction, ensure comfortable accommodation for the residents, provide quality guarantees for the owner and user.

4. Technical reform

A technical reform of the current regulations on buildings is necessary in Belarus. This must include a comprehensive set of measures, including the introduction of technical standards, which shall comply with the EU's Directive on Energy Performance of Buildings (Directive 2010/31/EU). The following aspects are regarded as particularly important:

- Promoting individual in-flat metering and regulation of energy resources (especially heat) with payments according to actually consumed amount.

Currently majority of existing houses in Belarus are equipped with group heat meters per house and individual electricity and water meters, so tenants tend to save electricity and water while heat is often wasted through open windows. All buildings should be equipped with individual metering devices and equipment regulating supply of energy resources in each flat or room. Different forms of economic stimulation or state support for tenants is required for introduction of individual equipment for registration and regulation of energy use by consumers (especially for heat), such as installment payment for the installation of individual metering devices for residents of apartment buildings.

- Introducing mandatory energy labels and certificates for building step by step.

The system of energy labeling of buildings should be introduced in Belarus not only at the designing stage, but also when putting buildings into operation after construction or refurbishment, sale or rent of existing buildings. This system serves as an instrument to ensure proper energy performance of buildings which are under construction or reconstruction and to stimulate energy-efficiency measures in existing buildings due to difference in market prices of housing with different energy classes. Apartment buildings and municipal buildings should provide information about their energy efficiency class (Energy Certificate) on the facades. This will allow to inform all tenants and involve them more actively in energy saving, Besides energy performance certificates can serve as a more transparent basis for decision-making about selection of buildings for financing energy-saving renovation works with state support, preferential credits or grants.

Energy certificates of buildings in Belarus should contain information about the type and function of the building, dates of construction and refurbishment, main characteristics, address and view, heat and electricity consumption; per square meter in standard conditions, energy efficiency class; recommended measures to improve energy efficiency of the building.

Energy certificates for buildings must be issued by organizations and experts, duly accredited. Education and retraining system should be created for preparing accredited experts and ensuring their skills. Database of all energy certificates issued and periodic quality control must be established. The data will allow quality and large-scale analysis of energy consumption in buildings and development of relevant strategies and action plans to increase their efficiency.

- Focusing on more efficient appliances and equipment

Awareness level about the energy efficiency of electric appliances and equipment is quite low. In order to improve the situation, the energy characteristics of all appliances and equipment should be mandatory posted together with the price. It is necessary to introduce specific energy efficiency requirements for the government and public buildings and organizations, for example taboo to purchase and install the equipment below the Class A.

5. Financing

There is a very big potential for energy efficiency in housing sector in Belarus which also means the need for significant investments. The loans provided by local banks are too expensive for the population and companies, and in most cases the savings from improved energy efficiency are not paid back in reasonable period due to subsidies of energy prices. The establishment of reliable financing system with opportunities affordable for the population and companies is the crucial aspect for promotion of energy efficiency in Belarus.

- Development of concessional lending, revolving funds, ESCOs for energy efficiency measures

It is important to develop concessional lending to individuals and legal entities of different forms of ownership for energy efficiency measures using revolving funds. It is necessary to create favorable conditions for energy service companies (ESCO), revolving funds in various fields, particularly in the housing stock and the construction sector, for organizations of different ownership forms and activities. The main advantage of the ESCO is the attraction foreign investments and loans, increasing energy efficiency without additional cost to the customer of ESCO services.

- Access to all forms of financing for energy efficiency measures to organizations with different forms of ownership

Access to public financing, concessional lending, private investment and other economic methods to stimulate the introduction of energy-efficient technologies should be available not only for government organizations (enterprises, housing companies), but also for individuals and legal entities of different forms of ownership, including access for homeowners' associations to finance energy efficient renovation of apartment buildings.

- Cooperation with commercial banks

The government needs to strengthen cooperation with commercial banks in order to create and promote the financial and loan products in the field of energy efficiency and energy-saving equipment.

6. Information and education

For a successful implementation of policies on energy efficiency in the residential sector, it is very important to facilitate awareness raising and educational campaigns among the population. Informative and educational measures on energy efficiency are necessary both for energy consumers and for professionals in the construction and refurbishment sector.

Awareness raising campaigns

One of the fundamental problems in Belarus is quite low level of the population's awareness on the topic of energy efficiency. Energy efficiency is a rather abstract topic and the population is often not aware of how simple measures like efficient ventilation and the use of a lid while cooking food can significantly reduce their energy bill at the end of the month.

Comprehensive, but at the same time simple and user-friendly informative materials on efficient energy consumption may stimulate the citizens' interest on energy-related topics and ensure steady improvements regarding their habits and lifestyles with regard to energy consumption.

Among the topics, which need to be covered in information materials are:

- the energy performance of a building in general as well as the energy performance of building components,
- the benefits of an energy efficient modernization,
- existing energy efficient equipment and home appliances,
- financing options for energy efficient modernization.

A lot of different recommendations can be offered in order to improve the situation. The partners of the ARCEE project find the two following aspects particularly important:

- In order to introduce the concept of energy efficiency already to very young citizens, it would be very useful to start mandatory educational programs at schools. The educational materials shall present the basics for environmental education with a particular focus on energy saving life-styles. Very important topics to be covered in the curricula are simple measures how to save energy in the household, waste management (including generating energy from waste), renewable sources of energy, wise resource consumption and many others. The information shall be offered in a very simple form supported by visual materials, using simple understandable examples, complemented with nice illustrations. This is regarded as a first step to raise an environmentally conscious generation, and will also help to distribute knowledge among parents and other family members. Learning the basics of rational energy use can be integrated at all stages of education (from primary to higher education) in the teaching of different subjects (not only specialized or additional required courses). For example, the math and Belarusian language can be studied using the texts and examples related to the topic on energy efficiency., NGOs and pedagogues have developed a large number of teaching materials and examples of lessons integrating ecology and energy saving topics. The

most successful handbooks and lessons should be collected, analyzed and edited for further dissemination among schools.

- It is necessary to establish the cross-sectoral information platforms on energy efficiency in Belarus for constant information exchange at national, regional and municipal levels. The platforms should provide information about best practice of energy efficiency in housing, different construction methods and analytical data on energy consumption, tariffs for different type of consumers with tips how to reduce the energy bills, existing possibilities of state support, loans and grants for energy saving measures, description of available services from ESCO and energy audit companies
- It is necessary to oblige the sellers of all electrical equipment and appliances to indicate the energy efficiency class of equipment together with its price. Moreover, the tips on choosing more energy-efficient modes and regimes of operation should be obligatory mentioned in the section "Instructions on operation of electrical appliances" sold in the Republic of Belarus'
- It is important to provide mechanisms for public participation in decision-making process and awareness raising. Interested non-governmental organizations can substantially contribute in analysis and recommendations development dissemination of information about efficient energy use among individuals and SMEs
- It is crucial to inform/instruct residents on the appropriate use of energy efficient measures (windows ventilation, turn on heater or mechanical ventilation for cooling only during the time of building use).

Education and training of specialists

In the context of their work on the ARCEE pilot projects on energy efficient refurbishment, the partners from the ARCEE project have noticed another obstacle for progress in the energy sector: the lack of qualified specialists on energy efficiency, including architects and construction workers.

Although local architects and engineers are informed about technical and passive methods to design energy efficient buildings, it seems that they do not properly consider this knowledge. One of the reasons is the fact that their awareness regarding the importance of energy efficient measures and their influence on the actual final energy performance of the building is poor. In the planning phase energy performance of the building is not properly assessed, several design options to achieve the best energy consumption are not tested. Besides, very often the unskilled labor prevents the correct execution of the details on the construction site which altogether results in low quality and low energy efficiency.

It is highly recommended to establish educational programs for key personnel from different relevant organizations (e.g. designing institutions, construction companies) about new construction technologies and methods, passive (without additional investments) design

measures to increase the energy performance of buildings. Some of the important aspects include:

- ensure building compactness
- consider building orientation to take advantage of the solar radiation
- avoid placement of elements which lead to heat loss through energy transmittance or unintentional ventilation (elevator shafts, garbage shafts, staircases, balconies, etc.) inside the heated area

7. Conclusion

There is enough potential for improving energy efficiency in the Republic of Belarus. The realization of this potential, as well as creation of preconditions for more effective management and stimulating the economy, involves the rejection of the usual forms of cross-subsidy, gaining an understanding of social and legal responsibility for the overall property, the implementation of price policy in relation to the market pricing and covering all costs.

A lot of support is required from the government. The legal background for implementing energy reforms has to be in place. Therefore, creating financing mechanisms and providing cheap reliable credits for the population and companies shall be one of the priorities for the government in establishing pleasant conditions for the development of energy efficient programs in the country.

In carrying out reforms, it is necessary to use international experience in energy efficiency, and to build cooperation with countries and regions that have achieved certain goals in a given area.

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