

Recommendations on energy efficiency in Russia

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

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Glossary

EBRD	European Bank of Reconstruction and Development
EPC	Energy performance contract
ESCO	Energy Service Company
EU	European Union
GEF	Global Environmental Found
HOA	Homeowner association
IEA	International Energy Agency
IFC	International Finance Cooperation
UNDP	United Nations Development Programme

1. Introduction

The housing sector has the highest energy saving potential, ranking as the second final energy consumer in Russia. Residential panel buildings often lose huge amounts of heating energy. These buildings are not insulated, have low quality windows and outdated pipes, radiators and other engineering installations.

Comprehensive refurbishment can greatly increase the energy efficiency of the residential buildings. In case of the old panel buildings it is up to 60% or more. It reduces heating costs and improves the indoor climate of the building increasing the living comfort of the residences. In addition, energy saving will lead to reduced fossil-based resource consumption, positively contributing to the mitigation of climate change.

A number of state programs and international projects aimed at improving energy efficiency of buildings have been implemented during the last years within the framework of the national strategy for energy saving. Nevertheless, their effectiveness on the regional and local levels, including St. Petersburg, is not high.

Many national and international organizations are working on the topic of energy efficiency in Russia, conducting research and providing practical recommendations on national, regional 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 partly based on the review of existing recommendations, but also includes recommendations developed by the partners of the ARCEE project, based on own experience and observations. To keep the paper concise, only those recommendations, which are regarded by the ARCEE project as the most crucial and realistic for implementation will be presented. A list of the used documents can be found at the end of the paper.

Preconditions necessary for implementing energy efficiency projects in Russia

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

- awareness raising programs and promotional campaigns on energy efficiency related topics,
- educational programs,
- legislative and institutional changes,
- technical reforms,
- improved possibilities to finance energy efficient modernization.

The basic measures shall be undertaken for development and implementation of above mentioned aspects. For example:

- Drafting of legal acts concerning energy efficiency, energy tariffs, standardization, construction code and regulations,
- Legislative initiatives development on municipal, regional and federal level,
- Development of monitoring system for energy efficiency and energy saving measures,
- Implementation of measures to stimulate energy saving on federal and regional levels,
- Implementation of comprehensive programme to reduce energy usage planned for 5 – 10 years.

2. Information and education

For successful implementation of energy efficiency in the residential sector it is important to pay attention to various aspects such as for example awareness and educational campaigns among the population. Information and educational activities on energy efficiency issues are important for consumers as well as for professionals in the field of construction and renovation.

Awareness raising campaigns

One of the fundamental problems in Russia is rather low level of public awareness on energy efficiency. Energy efficiency is rather abstract issue, and people often do not know how simple measures 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 in their habits and lifestyles with regard to energy consumption.

Among the topics that should be covered in the information materials are:

- energy performance of the building in general, as well as the energy performance of the building components,
- the existing legislation on energy efficiency,
- benefits of energy-efficient modernization,
- the available energy efficient equipment and household appliances,
- financing options for energy-efficient modernization,
- affordable ways to implement energy efficiency measures,
- good practice examples.

There are many different recommendations that may be offered to improve the situation. ARCEE project partners find the two following aspects are particularly important:

- In order to introduce the concept of energy efficiency to very young population, it would be very useful to introduce mandatory educational programs in schools. Educational materials should present the basics of environmental education with the emphasis on energy-saving lifestyle. Very important topics to be covered in the training programs for its simple measures on how to save energy in the household, waste management (including waste to energy), renewable energy sources, wise resource use, and much more. Information will be offered in a very simple form of visual materials using simple to understand examples, with nice illustrations. It is regarded as the first step in raising of environmentally conscious generation, and also can help to spread the knowledge among parents and other family members.
- In order to reach more people from different target groups, energy efficiency advertising campaigns (including in mass-media) should be conducted all over the country. It is also recommended to organize round tables, workshops, trainings, competitions and annual energy efficiency exhibitions.

For best results in the preparation of awareness raising campaigns it is necessary to take into account the needs of each target group and have an idea of what specific information is necessary, as well as what kind of information can be the most effective.

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 specialists in the area of energy efficiency and often not appropriately qualified professionals, including architects and managers of homeowner associations. Therefore, it is

highly recommended to establish educational programs for energy auditors and business planners, as well as a system of distance learning and dissemination of knowledge. Additionally, training programs for the key personnel from different relevant organizations (e.g. house owner associations) can be developed. This will ensure better skilled professionals in all sectors. Furthermore interregional exchange of experiences and best practices on energy-efficiency should be implemented.

3. Legal and institutional changes

Experts point out a number of reasons for the low efficiency of the implementation of energy efficiency measures in the construction and reconstruction of residential buildings:

- Legislation on energy efficiency at the federal level is not enough rigid in comparison with European countries,
- The use of certain energy saving solutions has not been certified and licensed by the state authorities,
- Low level of energy tariffs prevented the achievement of economic benefits through high payback periods for energy efficiency measures in residential buildings. According to the expert's opinion, the average payback period is 20 - 30 years, in case of maintaining the current tariffs,
- The lack of open dialogue between public authorities and construction business, homeowners, management companies and other stakeholders.

A wide range of recommendations has been developed with regard to improving the legislative basis. Some of the most important and urgently needed actions from the ARCEE project's point of view are pointed out below:

- The policy of strengthening the legislation on energy efficiency issues

It is necessary to constantly review and make more stringent the requirements for the energy performance of buildings in accordance with the long-term plan (in some countries it happens every 2-3 years). It is important to strengthen the position of energy certificates of buildings, to develop special regulations on energy efficiency for engineering systems,

- Improvement of the existing legal framework for the establishment of tariffs for energy resources

The level and structure of tariffs of energy supplying companies currently do not encourage the energy-efficient behavior of consumers and producers of energy. Measures to improve energy efficiency should be aimed at the covering by the consumers of all the resources costs they consume. First of all, a massive installation of meters is needed for the implementation of these measures. The important step is also the increasing of tariffs and following testing of alternative tariff methodologies

- Development of legislative and regulatory acts for certification and licensing of energy-saving technologies

Actions are needed in reduction of energy losses in its production and transportation, as well as in reduction of the flow of heat and electricity by automatic control and regulation equipment and engineering systems as a whole. Requirements for the content and order of the certificates issued must be clearly defined in the legislation of the Russian Federation, as well as the rules for determining the classes of energy efficiency of public buildings. In addition, one organizational task has not been solved, which is to give rights to individuals to carry out activities in the field of energy certification and distribution powers to regulate the activities of these persons between public authorities – for this purpose new regulations and corrections of already existing ones are needed,

- Combining the centralized system of state policy on energy efficiency with the system of funding from the federal and regional budgets for more efficient utilization of energy saving potential in the housing sector and stimulate the implementation of energy efficiency measures in the reconstruction of residential buildings

More recommendations, prepared by the World Bank and its partners can be found below¹:

- Establishment of energy efficiency champion

Dedicated government agencies for energy efficiency have become an increasingly common way to coordinate governmental actions on energy efficiency. Russia may want to consider designating an energy efficiency champion, which may include creating a separate office of energy efficiency within the country.

Around two-thirds of countries have a national energy efficiency agency and the most of them have a Ministry department dedicated to energy efficiency. Energy efficiency agencies help in promoting energy efficiency policies by designing, implementing and evaluating programs and measures that involve a range of stakeholders, including companies, NGOs, and local authorities. Generally, these agencies are public institutions funded through the federal budget, a tax on energy, or, in the case of some developing countries, overseas technical assistance funds. Whether Russia chooses to organize an energy efficiency champion as a separate agency, a department within a ministry, or through some other arrangement (i.e. a national project), the functions of the program could include:

- Providing technical expertise to the government and consumers. This is primarily done by creating and supervising a system for certifying the quality of energy efficiency equipment and services,
- Advising the government and sector regulators on legal and regulatory policy to improve energy efficiency,

¹http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2008/12/22/000334955_20081222045018/Rendered/PDF/469360WP0Box331C10EE1in1Russia1engl.pdf

- Coordinating government initiatives in the field of energy efficiency. Dedicated agencies help to avoid scattered, uncoordinated, and overlapping efforts by multiple ministries,
- Negotiating financial packages for energy efficiency with international financial institutions.²

➤ Improving energy data collection

It's necessary to organize a system for gathering and processing the energy consumption statistics of public organizations at both regional and federal level in Russia. Without detailed and systematic data reporting, collection, and analysis, producers and end-users will not be able to fully understand its energy efficiency challenges and potential,

➤ Improving competition in energy production and supply

Russia will not be able to reap the gains of energy efficiency without allowing for greater competition in energy production and supply. Monopolies or oligopolies in the oil, gas, and electricity sectors severely limit Russia's ability to tap its energy efficiency potential.

4. Technical reform

A technical reform of the current regulations on buildings is necessary in Russia. 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). Energy efficiency should be one of the priorities of the national energy strategy, as it is in the member states of the European Union. The following aspects are regarded as particularly important:

➤ Introducing mandatory building energy labels and certificates

Building energy labels and certificates will stimulate consumers to purchase more efficient products, contributing to informed choice by the consumer,

➤ Focusing on more efficient appliances and equipment

For St.-Petersburg, a problem of energy efficient technologies, equipment, materials and systems implementation in energy sector of the city due to the scale of energy production and consumption is of particular relevance. Implementation of energy-saving technologies is needed anywhere. It is not always cost-effective energy savings, therefore requires special consideration, including economic incentives to convince and motivate building owners to implement energy-saving measures. The following ways for implementation of energy-saving technologies for existing, reconstructed and designed building can be offered:

- Architectural planning and design,
- Measures on engineering systems,
- Measures for the use of secondary and renewable energy sources. Engineering systems focus on the equipment

For the purpose of the legislation requirements of the Russian Federation, Ministry of Economic Development has developed recommendations for the establishment of regional and municipal energy efficiency programs. Recommendations presented in the Order of Ministry of Economic Development of 17.02.2010 N 61 "On approval of the indicative list of measures in the field of energy conservation and energy efficiency, which can be used to develop regional and municipal programs in the field of energy conservation and energy efficiency." This document includes the following technical and technological recommendations for energy saving and energy efficiency³:

- The construction of multi-dwelling units in accordance with the legislation on energy saving and energy efficiency,
- Measures to improve energy efficiency in the capital repair of multi-dwelling units, for example, energy audits of buildings,
- The warmth-keeping of houses, flats and common areas in multi-dwelling houses beyond repair, and the introduction of control system for energy resources,
- Activities for modernization and reconstruction of multi-dwelling houses with energy-efficient technology and a reduction of the costs for providing housing and public services,
- Placing of information signs about classes of energy efficiency on the facades of buildings,
- Measures to improve the energy efficiency of lighting systems, including activities to install motion sensors and energy-efficient lighting equipment in multi-dwelling houses,
- Activities aimed to improving the energy efficiency of household equipment (stimulating replacement of refrigerators, freezers and washing machines with a lifetime over 15 years to the energy-efficient model),
- Replacement of boilers with individual heating system to energy efficient boilers, as well as using condensation boilers,
- Improving energy efficiency of elevators, for example, by the use of less powerful engines;
- Increasing the efficiency of water usage and reducing water losses This can be done by:
 - Construction of new or capital repairs of existing water supply systems,

³ Law Information System "Referent": <http://www.referent.ru/1/150496>

- Improve the reliability of reinforcement by replacing the rubber sealing gaskets in the valve to ceramic washers with a lifetime of about 20 years without maintenance, as well as the use of special filler and drain valves to a water closet supply tank,
 - Using the water-flow control devices with flexible diaphragm.
- Automation of heat consumption in buildings, for example, by using the local heat distribution and metering stations. The automation system monitors the temperature of the heat conductor, supplied to the building, and regulates it according to the temperature schedule, depending on the outdoor temperature. As a result of this regulation, heating energy surcharges are excluded, especially in autumn and spring. Heat meters for monitoring the heat supply to consumers, pressure sensors and other instrumentation should be installed at the output of boilers,
 - Thermal insulation of pipelines and energy efficiency of thermal points, distributing pipe heating and hot water,
 - Reconstruction / implementation of hot water circulating systems, automatic / manual balancing of the distributing heating systems and risers,
 - Installation of frequency drives control of pumps in hot water systems,
 - Relaying of electrical networks to reduce electricity losses,

These recommendations are the basis for further development of energy conservation and energy efficiency programs on the regional and municipal level. It should be noted that the Order of Ministry of Economic Development of 17.02.2010 N 61 is not required for execution – it is just guidance. However, the complexity of the measures can be the basis for granting the federal and regional subsidies for energy saving programs.

5. Financing

Energy efficiency measures often require significant investments. So far, the loans provided by local banks are too expensive for the population, and sometimes the savings from improved energy efficiency will be nullified due to very high investments. Lack of financial incentives from the state and the relevant financial instruments does not contribute to the implementation of energy efficiency measures and technologies by homeowners (HOAs management companies or municipalities).

In particular, the followings aspects are recommended in order to improve the financing options:

- Adoption at the federal or regional levels (i.e., at the level of the constituent entities of the Russian Federation) of regulation governing the provision of state support to promote the

extension of bank loans (credit facilities) for capital repair and energy efficiency improvement projects in multi-family apartment buildings,

- The establishment of clear and transparent regulation governing the granting of state subsidies to residents' organizations, on competitive terms⁴,
- Provision of preferential credits by commercial banks to homeowners (HOA and management companies) for the implementation of projects for the introduction of energy-efficient technologies in capital refurbishment, including the compensation by public authorities of expenses paid as interest rate.
- State budget support in the form of co-financing in energy audit, development of construction documentation to improve the energy efficiency of apartment building and the creation of energy passport of building,
- Creating guaranteeing funds,
- Soft loans for banks and international financial organizations,
- Concessional loans for Russian commercial banks and international financial institutions incl. Reimbursement of paying interest of loans by public authorities granted to investment projects in the field of energy efficiency in buildings⁵.

In addition, there are a lot of recommendations about development of energy service agreements (energy service contracts, ESCO's). Energy service contracts can play an important role in energy efficiency promotion. In EPCs, as a rule, payment is calculated based on energy savings achieved, or a certain level of savings is guaranteed by the service provider that is legally fixed in the contract.⁶

6. Conclusion

The main barriers to the successful implementation of energy efficiency measures in the construction and reconstruction sector in Russia are low level of population awareness on the topic; low energy tariffs; use of outdated technical solutions for old and new buildings; lack of financial incentives from the state and the lack of open dialogue between public authorities and representatives of the construction business, homeowners, management companies and other stakeholders. The solution to the existing problems requires an integrated approach to the implementation of national strategies and regional programs for energy efficiency by all governmental agencies, construction companies, homeowners and other stakeholders.

It is necessary to strengthen the scientific and educational potential, to develop the energy efficiency trainings, consider interregional experience and the best existing practices.

⁴ [http://www.asros.ru/media/File/filelist/Policy_Summary_-_Housing_Repairs_\(RUS\).pdf](http://www.asros.ru/media/File/filelist/Policy_Summary_-_Housing_Repairs_(RUS).pdf)

⁵ <http://www.undp-eeb.ru/files/buklet.pdf>

⁶ [http://www.asros.ru/media/File/filelist/Policy_Summary_-_Housing_Repairs_\(RUS\).pdf](http://www.asros.ru/media/File/filelist/Policy_Summary_-_Housing_Repairs_(RUS).pdf)



The process of developing and the adoption of laws and regulations should be more open and transparent. Changes in legislation on energy efficiency shall be available for wide public in relevant internet resources. And last but not least, there shall be a possibility for different stakeholders (i.e. civil society organizations) to participate in the discussion and open dialogue with the authorities.

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