

## ***Chapter 6. Energy Efficiency and Energy Saving in Residential Sector***

### **A. ENERGY CONSUMPTION IN RESIDENTIAL SECTOR**

The energy sector of the country is the source of 80 per cent of all emissions, 90 per cent of which are in the heat and electric power production sectors. Buildings, primarily in the residential sector, consume about 13.6 per cent of electric power and 40 per cent of heat power. The residential sector is the third largest consumer of heat and electric power in the country, after the energy and manufacturing sectors.

The majority of the housing stock consists of old non-energy-efficient buildings, with the district heat- and energy supply systems constructed in 1950-1985. According to experts, the consumption of heat energy in buildings in Kazakhstan is about 240 kW/m<sup>2</sup> per annum (in comparison, this indicator in Sweden is 82 kW/m<sup>2</sup>; in Germany, 120 kW/m<sup>2</sup>; in France, 126 kW/m<sup>2</sup>; and in England, 130 kW/m<sup>2</sup>). In 2010-2013, a mass energy audit of the residential buildings in Kazakhstan was conducted, which demonstrated that apartment buildings have a high consumption of heat energy: for example, in Almaty, the average consumption of heat energy per annum was 136 kWh/m<sup>2</sup>; in Atyrau, 181 kWh/m<sup>2</sup>; and in Kokshetau, 257 kWh/m<sup>2</sup> (according to the JSC “Kazakhstan Centre for Modernization and Development of Housing and Utilities”).

The housing stock consists mostly of multi-apartment buildings. For the production of electric and heat energies in 2015, 43.6 million tonnes of the equivalent fuel<sup>95</sup> were used, 72 per cent of which was coal. Natural gas (20 per cent) is used as a primary fuel in the west and south regions of the country.

More than a half of greenhouse gas emissions in the heat- and energy supply sectors in Kazakhstan originate from premises heating (due to climate specificity). In 2015, 60.8 million Gcal<sup>96</sup> of heat energy was distributed, including 24.1 million Gcal (39.6 per cent) for population. One fifth of total emissions in the residential sector comes from the consumption of hot water and electricity. The remaining share includes cooking and other types of heat and electric energy consumption. Coal is used for production of 85 per cent of electric energy in the country.

### **B. POLICY AND MEASURES ON THE PROMOTION OF ENERGY EFFICIENCY IN THE RESIDENTIAL SECTOR**

In recent years, improvement of energy efficiency became a national strategic priority. The political will of the country in the promotion of energy efficiency was expressed through the adoption of a number of strategic documents, namely the Strategy of Transition of the Republic of Kazakhstan to a “Green” Economy”, Strategy-2050, and programmes such as Nurly Zhol, 100 Steps of the Nation, Energy Saving-2020, and others.

Energy-efficiency issues are within the competence of different government institutions, particularly, the CCHCS and the Committee on Industrial Development and Industrial Safety of the Ministry for Investments and Development (energy saving and energy efficiency).

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<sup>95</sup> Republic of Kazakhstan, Committee on Statistics of the Ministry of National Economy, Statistical Book “Fuel and Energy Balance”, (Astana, 2016).

<sup>96</sup> Republic of Kazakhstan, Committee on Statistics of the Ministry of National Economy, Statistical Book “Housing and Communal Services”, (Astana, 2016).

The main document on energy efficiency is the Law of the Republic of Kazakhstan No. 541-IV on Energy Saving and Energy Efficiency Improvement of 13 January, 2012. For energy efficiency in buildings, in particular, the Law introduced the term “thermal modernization” for the first time, defined as the activities regarding the improvement of thermal and technical specifications of a building leading to a reduction of heat losses. Furthermore, Article 11 of this Law “ensures an energy efficiency of the buildings, structures, and premises when designing and construction”. The term “building energy-efficiency class” was determined, a designer’s competence was introduced for the development of an “Energy Efficiency” section, for determination of the building energy-efficiency class and for the observance of energy saving requirements and energy-efficiency improvements as imposed by the design (design and estimate) documentation of the buildings. The required energy-efficiency class is specified in a Customer’s Specification for Construction Project Development (reconstruction, capital renovation), and is indicated in the technical data sheet of the constructed and commissioned facilities when registering the real property rights after putting the completely constructed (reconstructed, capitally repaired) facility into operation.

Moreover, the Law specifies the responsibilities of the competent authority on the enforcement of the requirements regarding energy saving and energy efficiency in architectural and engineering, and other pre-design and/or design (design and estimate) documentation to be developed and approved for the purposes of reconstruction and construction of buildings. Currently, the “Energy Efficiency” section and the availability of the Energy Data Sheet are checked if there is an expertise of the design documentation. The energy-efficiency class of existing buildings, structures, and premises and its revision is determined in the manner established by the competent authority according to the results of the energy audit, and is specified in the data sheet of the building, structure or premises. The energy audit report is attached to the data sheet of buildings, structures, and premises. Energy-efficiency labeling of existing buildings, structures, and premises is established according to the results of an energy audit, and is specified in the energy audit report.

A possibility, indicated in the Law, to assist and support the owners of residential buildings and residential accommodations (apartments) with the payment of measures aimed at energy saving and improvement of energy efficiency in compliance with the housing legislation is of special importance. Also, this Law requires that the design of multi-apartment buildings should provide the compulsory use of energy-efficient materials, installation of in-house heat and water metering devices, in-apartment electric energy, cold and hot water, gas metering devices, heating system controllers, and automated heat consumption control systems.

In addition, Kazakhstan adopted construction standards, such as SNRK 2.04-04-2011 “Buildings Heat Insulation”, establishing the energy-efficiency requirements regarding the design of new buildings. The UNDP-GEF Project “Energy Efficient Design and Construction of Residential Buildings in Kazakhstan” developed a rating table of building efficiency class (see Annex 2) according to heat consumption in compliance with these regulatory documents when designing new residential buildings in pilot cities.

Furthermore, in compliance with the Law on Energy Saving and Energy Efficiency Improvement, the following Resolutions were adopted, which govern the execution procedure of this Law regarding energy efficiency of buildings:

- Resolution of the President of the Republic of Kazakhstan No. 1181 on Setting the Requirements to Energy Efficiency of Buildings, Structures, Premises and their Elements being a Part of Enclosing Structures of 11 September 2012;

- Resolution of the President of the Republic of Kazakhstan No. 1117 on Adoption of Rules for Determination and Revision of Energy Efficiency Classes of Buildings, Structures, Premises of 31 August 2012; and
- Resolution of the President of the Republic of Kazakhstan No.1192 on Adoption of Requirements to Energy Saving and Improvement of Energy Efficiency Imposing to Pre-Design and/or Design (Design and Estimate) Documentations of Buildings, Structures, Premises of 13 September 2012.

For the International Exhibition “EXPO-2017 – Future Energy”, there is increased interest in “green” building construction and certification in Kazakhstan, with the aim of complying with environmental assessment standards. National companies (Astana EXPO-2017 JSC, Samruk-Kazyna Fund and BI Group) are working on the development of a design for “green” districts and exhibition pavilions, which are expected to be certified to obtain the estimates according to the “green” construction rating systems.

One of the first steps for the implementation of the energy-efficiency policy in Kazakhstan cities is the development of economic mechanisms to support the installation of heat metering devices and energy products at public facilities, industrial enterprises, and housing sector facilities, and the subsequent practical introduction of the first devices of individual and group fiscal metering.

Since 1 July 2012, a provision of the Law on Energy Saving and Energy Efficiency Improvement was introduced, according to which consumers shall pay for heat energy according to differential tariffs, depending on the availability, or lack of, heat energy measuring devices<sup>97</sup>.

Thus, the heat supply tariffs in Astana have been set with differentiation, depending on the availability, or lack thereof, of heat energy metering devices in the population:

- if heat metering devices are available, KZT 2,485.45/1 Gcal;
- if heat metering devices are not available, KZT 2,994.91/Gcal; and
- if population living in shabby, failing private premises, and bunk houses where it is impossible to install in-house heat metering devices, KZT 2,495.76/Gcal<sup>98</sup>.

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<sup>97</sup> This regards in-house heat metering devices. Note that consumers in multi-apartment buildings can have individual heat metering devices and pay according to them, according to legislation. However, in practice, it is impossible to do so for different reasons, both technical (rising wiring of the heating system in the building and the impossibility of installing the devices) and economical (high costs for the calibration and maintenance of the devices).

<sup>98</sup> As of March 2017, the exchange rate was USD 1 \$ = KZT 318

**Picture 5. An example of an energy efficient residential building in the city of Lisakovsk, Kostanay region (the building underwent complex thermal modernization)**



*Photo by:* Alexander Belyi.

### **C. POSSIBILITIES FOR THE PROMOTION OF ENERGY SAVING IN THE RESIDENTIAL SECTOR**

The current state of energy-efficiency improvement in the residential sector can be assessed as a period of slow creation of an ideology, legal and regulatory provisions, and their slow transfer to practical activity, with the subsequent gradual testing of actual energy-saving technologies.

The following key factors should be mentioned, whose elimination will allow the promotion of the energy-saving process in the residential sector.

Firstly, in case of the existing tariffs for natural monopoly services (such as energy system), a payback period of investments into energy-saving projects on the side of a consumer is too long. The low-paying capacity of most of the consumers, and partial payment for consumed energy (involving energy subsidies<sup>99</sup>), determine non-attractiveness of the sector for investing in the modernization and technical upgrading of residential buildings and facilities. As a result, the quality of energy supply services is decreasing, energy losses are increasing and infrastructure is becoming further out-of-date.

Secondly, construction standards determining the requirements regarding energy efficiency of residential buildings are not always observed regarding the construction of new buildings in order to decrease construction estimate costs<sup>100</sup>. Consumers, in turn, are unaware of the real state of a facility to be put into operation due to the non-availability of energy data sheets for the facilities, although the latter is required for the approval of the design and estimate documentation.

<sup>99</sup> OECD Report.

<sup>100</sup> United Nations Development Programme, Review of activities and results of the UNDP/GEF Full-Size Project “Energy-Efficient Design and Construction of Residential Buildings”, (Astana, 2015), 22 p.

Thirdly, even if a facility has been constructed in compliance with all energy-saving norms and regulations, maintaining its operational condition to ensure the energy characteristics as specified by the project is often problematic. There are no mandatory standards in Kazakhstan regarding the maintenance and operation of the housing fund, including those concerning the level of energy efficiency regarding building. In fact, there are no clear regulations on the maintenance of multi-apartment buildings to be strictly observed by the owners. Currently, owners are given complete control over decision-making (renovations, prevention, maintenance of engineering utilities, communications, etc.). As there are no any existing regulations, apartment owners have a right to waive the necessary operating costs, including costs related to the maintenance of equipment regulating the energy consumption level in the building (for example, heating distribution units, equipment for effective lighting, etc.).

Fourthly, content for capacity building (curricula and, as a consequence, qualification of the graduates) in the field of energy saving fails to comply with the competences required to take different decisions related to the operation and maintenance of residential buildings. The personnel working in these fields does not have sufficient qualifications and competences to make effective energy-saving renovations and further operation of the equipment installed.

And lastly, fairly high values of specific energy consumption in the housing stock are also explained by the existing system of housing management. As is known, after the privatization of apartments, multi-apartment buildings are managed by the association of apartment owners (AAO) and other forms of condominiums. These forms of condominiums deal with the maintenance of the heating systems in the residential buildings (heating distribution units), the preparation of the housing stock for winter conditions, etc. The apartment owners pay for these works through specific charges or monthly payments for building maintenance. For consumed heat read from metering devices (where installed), an apartment owner pays directly to the energy supply company. The management and service provider companies are not motivated to monitor the level of energy consumption because of a lack of clear housing maintenance standards and energy-efficiency target values. This relates to both heat and electrical energy for in-house needs (lighting of public places and other general costs).

#### **D. INFORMATION ABOUT THE ACTIVITIES OF DONORS IN THE FIELD OF HOUSING ENERGY EFFICIENCY**

Since 2007, the UNDP in Kazakhstan, with the support of different donors (particularly, the Global Environment Facility, and the Kazakhstan Government), has been implementing projects aimed at the improvement of energy efficiency and energy saving in different economic sectors, including in the residential one. Among the implemented projects are “Removing Barriers for Improvement of Energy Efficiency in Municipal Heat Supply” (2007-2013), “Integrated Energy-Efficiency Solutions in Small Settlements” (2013-2014), “Energy-Efficient Design and Construction of Residential Buildings” (2011-2015), “Promotion of Energy-Efficient Lighting” (2012-2017), and dedicated components on the housing and communal infrastructure implemented as part of the regional UN Joint Programmes in the Kyzylorda and Mangistau regions (2014-2016).

These projects contributed, and are contributing, to the conservation of the global environment through reducing greenhouse gas emissions by creating the conditions for the complex thermal modernization of buildings and the testing of various technical and organizational solutions leading to energy saving in residential buildings.

The key achievements of these UNDP projects and initiatives for this period are:

- the successful involvement in the adoption of the Law on Energy Saving and Energy Efficiency Improvement, approved in January 2012 and amended at the end of 2014. The Law includes such terms as “thermal modernization of buildings”, “energy-efficiency class”, “energy service company” which promote energy efficiency in such a socially important sector as the housing one;
- the demonstration of the sustainable practices of energy-efficiency improvement in residential buildings with an annual effect of reducing the costs for energy by up to 40 per cent, and a reduction of greenhouse gas emissions of up to 180 tonnes per modernized building;
- the demonstration of essential social and economic benefits for Kazakhstan from energy saving in the form of the creation of new jobs, and an increase in access to sustainable energy. It is estimated that the thermal modernization of one multi-storied building creates, on average, 1 to 2 permanent “green jobs” annually;
- the demonstration that the use of new energy-efficient technologies when constructing residential buildings, while raising building costs by 10 per cent, allow for energy efficiency of 35-40 per cent. A building constructed in this way will comply with a high energy-efficiency class (class B); and
- introduction of amendments to the existing normative technical documents with the attribution of the energy efficiency class to the comfort class of the building, in particular Rules of the Republic of Kazakhstan, 3.02-101-2012 “Residential apartment blocks”;
- based on approved solutions with the involvement of the UNDP, the regulatory and technical documents for the design of energy-efficient residential buildings in Kazakhstan were developed and took effect from 1 July 2015, and the existing building construction standards which govern energy efficiency according to a comfort class of buildings to be constructed were amended.

Examples of different pilot projects aimed at energy-efficiency improvement in residential buildings implemented by UNDP-GEF are given below.

## Example 1. Implementation of smart technologies in heating and energy management: residential building in Aktau

The project, which was focused on the implementation of smart technologies and innovations in the energy management of residential homes, aims to solve heat consumption issues in the central heating system.

The control and automatic regulation of temperature and circulation of heat depends on the outside air temperature. Energy management at home will help the management company to introduce and ensure rational consumption of energy and water.

### Main Outcomes



Reduction of estimated heat consumption and savings during the heating season



Estimated savings when implementing energy management project in condominiums

## Example 2. Energy Efficiency: association of apartment owners “Maksat”

### Project process



- selection of a facility
- signing reciprocal contract with owners
- project design and cost estimation
- equipment supply and installation contract execution
- grant from UNDP/GEF
- preparation of grant application
- supply, installation, putting equipment into operation
- energy-efficiency revolving fund structures
- implementation of additional energy efficiency measures for heat saving

### Outcomes

estimated for period Sep 2011 - Apr 2016



3 326 156 KZT

costcutting transferred to energy-efficiency revolving fund



219.4 tons

greenhouse gas emission reduction



27% (417 GCal)

reduction in heat energy usage



improved

heating supply quality

**Example 3. Modernization of heat consumption system using ESCO (energy service contract) mechanism: Karaganda**

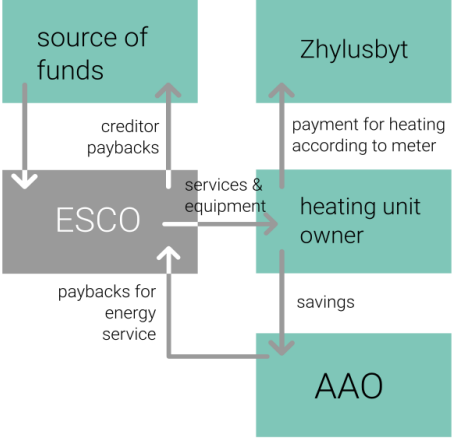


This project is the first of its kind to demonstrate apartment building modernisation using the energy service company/contract (ESCO) model.

**Outcomes**

- up to 762 000 KZT
savings on winter heating payments
  
- 2.9 mln KZT
cost of energy service contract (ATP with metering unit + service)
  
- 5.5 mln KZT
additional actions on energy efficiency windows, roof, basement etc,
  
- up to 27%
annual housing heating savings
  
- up to 140 tons
annual reduction in greenhouse gas emissions

**ESCO Model**  
'energy efficiency by installments'



- ✓ No need for initial investment from apartment owners in project implementation
- ✓ Energy savings due in cost of payments for ESCO services
- ✓ Owners obtain renewed estate without initial investments
- ✓ Modernization payment made in installments

In 2010-2013, a German-Kazakhstan Project “Development and Implementation of Qualification Improvement Course – Management of Building Energy-Saving Rehabilitation” was implemented in Kazakhstan. This project was supported by the Federal Ministry for Economic Cooperation and Development of Germany; the private businesses Viessmann Industrial Group, Profine, Lacufa; and a non-profit organization from Berlin “Initiative Wohnungswirtschaft Osteuropa”.

Within the project implementation, workshops and events were conducted in five regions of Kazakhstan, which focused on buildings’ energy-saving rehabilitation, and familiarization with the European practice of housing renovation. Within the project implementation, a training course “Management of Buildings’ Energy-Saving Rehabilitation” was developed with the support of international and local experts.

In 2012, as part of the activities of the Task Force on the Implementation of the Environmental Action Programme (EAP Task Force) for Eastern Europe, Caucasus and Central Asia, the Project “Improvement of the Energy Efficiency of the Residential Sector in Kazakhstan: a pilot design of the public investment program” was implemented. The similarly-named published report summarizes the results of a pilot project implemented to support the activities of the



Ministry of Environmental Protection on the identification, development and cost estimation of the long-term programme of budgetary investments in a key area related to the climate change – energy efficiency of the residential sector. The residential sector was designated as a priority; the main phases, criteria and tools for the development of the budgetary investment programme were to be demonstrated. The developed programme provides three project portfolios:

- *the thermal insulation (thermal renovation or modernization) of residential buildings, particularly of typical bearing-wall residential buildings;*
- *the assembling of automatic building level substations (BLS) and the installation of thermostatic regulators on the radiators to improve heat-energy distribution according to needs, and increase the thermal comfort in the living space; and*
- *the transfer from coal to natural gas when producing energy for heating in the residential sector (i.e. local boiler stations supplying heat to multi-apartment buildings).*

The proposed design of the public investment programme on energy-efficiency improvement in the residential sector of Kazakhstan has not yet been put into practice.

## ***Conclusions on Housing Sector***

### *Housing Policy and Housing Construction*

The Republic of Kazakhstan is a country with a steadily growing population. Since 2011, the population has been annually increasing by 1.40-1.45%. As of 1 January 2017, the total population was 17,918.2 thousand people, of which 57.21% lived in urban settlements. According to forecasts, the population of Kazakhstan will reach 24 million people by 2031.

The population is unevenly distributed across the country. With an average population density of 6.6 people per 1 square kilometre, the most densely populated South-Kazakhstan region has 24.5 persons/km<sup>2</sup>, the capital city of Astana has 1,389.6 persons/km<sup>2</sup>, and the largest city of Almaty has 2,501.9 persons/km<sup>2</sup>.

The further territorial development is planned as the development of urban agglomerations with hub cities of Astana, Almaty, Shymkent, Aktobe, and, in the longer term, Ust-Kamenogorsk. Even now, the emerging urban agglomerations are home to a third of the population. In rural areas, there are plans to develop hub human settlements, whose industrial and social infrastructure will be used by citizens living in adjacent areas.

As of 1 January 2017, the total floor area of the housing stock was at 342.6 million m<sup>2</sup>, 76.2% of which were urban housing stock. From 2005 to 2016, the housing stock of the country increased by 34.56%, at the same time since 2009 the growth rate of the urban housing stock has been 2-3.5 times higher than that of the rural one. Out of 5,115,260 homes that Kazakhstan has, 66.4% are located in urban settlements and only 33.56% are in rural areas.

Given the general increase in housing provision between 2005 and 2016 (from 17.5 m<sup>2</sup> per person to 21.4 m<sup>2</sup>), the housing provision with regard to the urban population is higher than that in rural areas – 24.0 m<sup>2</sup>/person, and 18.0 m<sup>2</sup>/person, respectively.

Despite fairly good average statistical indicators of housing provision (21.4 m<sup>2</sup> of housing per person, and 1 home per household), there is still a significant demand for housing resulting from population growth, migration and urbanization. About 14% of the population (about 2.5 million people) are in need of housing. These figures take into account only citizens registered with local executive authorities as those in need of housing and entitled to housing from the municipal (state) housing stock (400 thousand people), participants of the housing construction

savings system (who have deposits in the Housing Construction Savings Bank – 780 thousand people), and citizens placed on the waiting lists to be allocated land parcels for individual housing construction (1.3 million people).

To meet the current housing demand, as well as taking into account the projected population growth, by 2031 it is necessary to increase the floor area of the housing stock by at least 54% as compared to the existing stock (even without any increase in the housing provision indicator of over 22 m<sup>2</sup> per person, which is targeted for 2020). In this regard, Kazakhstan faces an ambitious housing construction challenge: between 2016 and 2030, the country should annually put into commission an average of at least 12 million m<sup>2</sup> of housing.

Creating favourable environment for housing provision is a priority of the national housing policies in the Republic of Kazakhstan. Since 2005, the Government has adopted seven government housing construction programs. Government programmes provide framework for the development of various housing construction mechanisms. While the initial programmes were aimed at satisfying housing needs on the market, the recent government housing construction programme “Nurly Zher”, approved in December 2016, aims to ensure housing provision for people with different incomes. The programme was designed for a five-year period (2017-2021) and it is supposed to provide housing for 1.5 million citizens. Housing provision is planned to be improved through the following mechanisms:

- *construction of rental housing for socially vulnerable categories of population* – housing construction by local authorities at the cost of targeted transfers from the Republican budget to be leased (with no purchase option) to citizens placed on waiting lists and entitled to housing provision from the communal housing stock;
- *support of individual housing construction* through provision of citizens with land parcels equipped with communal infrastructure, development and free distribution of model projects for the construction of individual houses from local materials and structures (predominantly industrially manufactured), as well as pilot projects of individual housing construction by a single public customer in a unified architectural style with their subsequent sale to citizens placed on waiting lists for land parcels for individual housing construction;
- *construction of affordable housing for participants of housing construction savings system* – construction of apartments with limited floor area and price to be acquired by citizens for their deposits kept in the Housing Construction Savings Bank and preferential housing loans granted by the Bank;
- *encouraging construction of affordable housing by private developers* through the provision of soft loans for the construction of housing with limited floor area and fixed price;
- *increasing the availability of mortgage loans* by providing banks with subsidies to reduce their interest rates on mortgage loans;
- *support of shared-equity housing construction* by providing citizens with guarantees with respect to the obligations of private developers through the Housing Construction Guarantee Fund.

Under the Nurly Zher programme it is planned to put into operation 62.41 million m<sup>2</sup> of housing due to all sources of financing (taking into account the commissioning of 2016 planned under the Regional Development Programme 2020). In 2016 10.53 million m<sup>2</sup> of housing were put into operation (17.6% more than in 2015), of which 5.2 million m<sup>2</sup> were commissioned by individual developers.

Successful implementation of the Nurly Zher programme will significantly advance the solution of the problem of providing the population with housing. But after it is completed, it is necessary that the worked out mechanisms continue to operate.

Due to the data on necessary housing construction, taking into account the goal of achieving housing provision in 2020 of 22 m<sup>2</sup>, it is necessary to increase the annual construction from the planned 10.4 million m<sup>2</sup> to about 12 million m<sup>2</sup>.

Based on the number of registered people in need of housing (2.5 million people), the implementation of the programme will not completely solve the problem of providing housing as it provides for the construction of housing for 1.5 million people. It is also necessary to take into account that the number of people in need will increase during the implementation period of the programme. In addition, there is an unaccounted need for housing for those households that do not belong to socially vulnerable categories with the right to housing in the communal fund and are not investors of HCSB, as their incomes do not allow them to make savings and buy housing on mortgages.

Thus, upon the completion of the Nurly Zher programme, the government needs to support the established mechanisms through the introduction of new programs that must take into account, among other things, housing security indicators or housing space standards for provision.

The government presence in the housing construction sector is very significant. In addition to local executive authorities (akimats of regions, districts, cities of Astana and Almaty), national development institutions and companies with state participation also take part in the implementation of the government housing programmes. Substantial budgetary funds are allocated for addressing housing provision challenges.

It should be noted that all housing construction mechanisms within the framework of government programmes are aimed at the acquisition of home ownership by citizens. Meanwhile, as a result of privatization of the public housing stock, Kazakhstan, as well as other former socialistic countries, lost virtually its entire rental housing sector. Although the construction of rental housing was announced as one of the promising areas of housing construction, rental housing constructed under government programmes is provided to citizens placed on the waiting lists with local executive authorities with an option to purchase such apartments within 15 to 20-year period (with the exception of apartments from communal housing stock provided to socially vulnerable categories of citizens). Thus, rental housing remains rental only for a certain period of time, until it is redeemed at the expense of the rental payments, after redemption the housing is no longer rental and it becomes privately owned by citizens. In the longer term, it can be expected that there will re-emerge issues with management, maintenance and repair of multi-apartment rental houses, which, following the buy-out of apartments, will become condominium objects; these issues will be similar to those of apartment houses with privatized apartments.

Few houses constructed within the framework of communal housing stock projects are targeted exclusively at socially vulnerable groups of citizens placed on social housing waiting lists with local executive authorities. In Astana and Almaty, to be placed on such lists, citizens eligible for social housing are required to permanently reside in these cities for at least three years. A large proportion of low-income households, which do not belong to socially vulnerable groups and whose incomes make it impossible for them to build up savings at the accounts of the Housing Construction Savings Bank, cannot afford to satisfy their housing needs. The demand for affordable rental housing of middle-income households is neither satisfied. The demand for affordable rental housing is especially significant in developing urban agglomerations, which are the destination of internal migrant flows. Currently, it is satisfied only by the provision of rental housing owned by citizens at a semi-legalized market of commercial rental housing.

Transition economies are only beginning to discuss the question of establishing non-profit rental housing sector. The Russian Federation adopted legislation on social rental housing and commercial rental housing in 2014. However, there are very few examples of social rental housing construction as municipalities lack financial support from the government. This fact confirms that establishment of the sector of affordable rental housing, which can be rented by citizens with different incomes for different periods, requires government support.

Kazakhstan has an extensive experience of providing government support to housing construction, it has good capacity to develop a specialized programme aimed at establishment of affordable rental housing sector to meet the housing needs of citizens who are not entitled to social housing and cannot or do not want to acquire housing in their ownership.

The housing stock in Kazakhstan has a fairly high level of development. Water is provided to more than 99% of multi-family and individual buildings in urban settlements and to more than 96% of the buildings in rural human settlements. 89.7% and 80.8% of apartment houses in urban areas are supplied with central heating and hot water, respectively. High level of gasification (more than 95%) of individual houses in both urban and rural settlements, as well as that of apartment houses in rural areas makes it possible to ensure heating and hot water supply from individual installations.

The objectives of ensuring citizens' access to clean water and other utility services, as well as reducing significant degradation of utility networks have always been addressed through several government programmes aimed at development and modernization of municipal infrastructure. The Republican budget allocates substantial funds for the implementation of infrastructural projects; funds are also raised from international financial organizations.

Following the reorganization of the Republican state executive authorities in 2017, the responsibility for the implementation of the Nurdy Zher housing programme and infrastructural development programmes is shared by the Ministry for Investments and Development of the Republic of Kazakhstan and the MoNE. This requires good coordination between the ministries, government development institutions and local executive authorities involved in the implementation of government programmes. At the same time, challenges of housing and utility sectors are a priority for neither of the ministries.

#### *Management, Maintenance and Repair of Multi-Apartment Housing Stock*

As of 1 January 2017, multi-apartment buildings made up only 14.14% of the total number of residential buildings in Kazakhstan, but apartments in multi-apartment buildings made up 51.43% of the total floor area of the country's housing stock. About 97% of the housing stock were in private ownership. So, almost every apartment building in Kazakhstan (except those constructed within the framework of the government programme of rental housing) is an object, in which apartments and non-residential premises are in individual ownership of citizens and other persons, while shared property (common areas, supporting structures, engineering systems, etc.) belongs to all homeowners as a right of common shared ownership. The legislation of the Republic of Kazakhstan defines such type of ownership as "condominium." The relations in multi-apartment buildings/condominiums are governed by the law of the Republic of Kazakhstan "On Housing Relations" (1997). The main provisions of the law "On Housing Relations" with regard to management and maintenance of multi-apartment houses are similar to the legislation of other transition economies, which saw the privatization of their public housing stock, and stipulate that a general meeting of homeowners shall make decisions on management, maintenance and repair of common property in multi-apartment buildings, and

also that homeowners in a multi-apartment building shall be entitled to create a legal entity – a cooperative of apartment (home) owners (traditionally abbreviated as CHO) to manage a multi-apartment building or to choose another method of management.

Kazakhstan is facing serious challenges regarding management of multi-apartment buildings/condominiums. They relate, first of all, to the fact that homeowners are not sufficiently active in managing their shared property because of lack of awareness and overcomplicated rules for making decisions at general meetings. Second of all, they are related to the predominance of multi-house CHOs in the management of apartment buildings; such CHOs were established during the privatization process upon the initiative of local executive authorities rather than new homeowners to replace public housing and maintenance organizations. Homeowners in such CHOs are practically not involved in the process of making decisions on management of their shared property. Such CHOs seem to be managing and servicing organizations rolled into one rather than associations of apartment owners, representing their interests. Multi-house CHOs do not contribute to the formation of the market of professional services to ensure management and maintenance of apartment buildings, nor do they provide professional level of management services for apartment houses and their adequate maintenance.

Other countries have similar challenges. For instance, Uzbekistan had similar challenges with managing apartment buildings by multi-house associations of homeowners. They were overcome in many respects through the awareness-raising of apartment owners, maximum simplification of procedures for exiting such associations and establishing single-house associations, as well as through economic preferences provided to the newly created private managing and servicing companies.

In Kazakhstan, the government efforts to improve the management and maintenance of apartment buildings were mostly aimed at reinforcing the legislative requirements for the CHOs' activities (obligation to open a separate bank account for each multi-apartment building managed by a CHO, prohibition to provide maintenance services for apartment buildings using their own resources, and obligation to enter into contracts with service companies), and conferring special powers to housing inspections under local executive authorities. The requirements of the legislation are not fully implemented in practice, in particular because of the lack of an adequate environment for their implementation. There is no system for training professional managers, there is no market for maintenance of apartment buildings (the fact that CHOs cannot afford to pay for the services of private servicing companies makes this area unattractive for new businesses).

For most CHOs, the small amount of contributions from apartment owners on maintenance of shared property makes it impossible to ensure all necessary maintenance and repair works in apartment houses. This entails accelerated degradation of multi-apartment housing stock, and increased need for its refurbishment. About a third of the multi-apartment housing stock is in need of urgent refurbishment, as well as improving its energy efficiency.

Amendments made to the law “On Housing Relations” in 2011 call on homeowners in multi-apartment buildings to build up savings for the refurbishment by making special contributions. This legislative requirement is not fully implemented because it is necessary to make a relative decision at a general meeting, as well as because of an excessively high amount of contributions established by the law. Contributions for refurbishment are paid mainly in apartment buildings, which are refurbished under government programmes.

Under government programmes, apartment buildings are refurbished at the cost of targeted budgetary funds, which are subsequently reimbursed by homeowners through the payment of

contributions for refurbishment during 8 to 15-year period. Thus, the scope of refurbishment of apartment buildings is limited by budgetary funds. Refurbishment works are carried out by authorized organizations (general contractors) specially established by local executive authorities, which makes it impossible to take advantage of market-based competition during refurbishment.

The Kazakhstan's mechanism of funding and refurbishment of multi-apartment buildings is not consistent with the best international practices of providing budgetary funds for refurbishment and improving energy efficiency as subsidies to support initiatives of homeowners' associations, as well as of creating environment for them to attract loans for refurbishment and modernization of apartment buildings.

According to official statistics, dilapidated housing stock makes up only 0.5% of the total floor area of the housing stock. Most dilapidated residential buildings are located in urban settlements, in particular in Almaty. The mechanism for the liquidation of dilapidated housing and relocation of citizens is currently going through the development stage in the context of a pilot project in the city of Astana. Dilapidated housing is demolished and new buildings are constructed by an authorized public organization at the cost of earmarked budgetary funds. Citizens relocated from dilapidated buildings are provided with homes of equivalent floor areas.

Kazakhstan also has a system of granting budget subsidies to low-income households (housing assistance) to pay for housing costs and utilities.