

UDC 711

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## **TRANSITION TO PROJECT FINANCING IN HOUSING CONSTRUCTION AS A NEW VECTOR OF URBAN DEVELOPMENT**

### **Introduction**

The development of urban areas in Russia is closely linked to the problem of resettlement, which is based on two key factors: the size of the population of our country and the extent of the territory. The ratio of the population is about 150 million people, and the size of the territory is over 17 million km<sup>2</sup>. It makes it possible to estimate the population density: about 9 people per km<sup>2</sup>. While in other countries the density is much higher: in the USA, 30 people per km<sup>2</sup>, in Germany 229, in France 109 correspondingly. However, the resettlement of the population in our country is fairly selective. The main territory (more than 60% of the territory) is inhabited very poorly, less than 1 person per km<sup>2</sup>.

Difficulties with proportional settlement are linked not only with the climatic features of particular territories (sharply continental climate, mountainous terrain, wetlands, etc.), but also with limited access to resources, including material and financial resources. Another significant factor affecting the resettlement feature is the significant distance between centres for the extraction of raw materials and its processing centers for the production and consumption of energy, which determines the high cost of infrastructure solutions for creating comfortable living conditions in remote areas.

All of that is the foundation of the improvement expediency and transformation of the already developed territories in the infrastructure-developed regions of the country where the greatest concentration of population and production capacities take place. This approach is based on the principle of minimizing costs and is evident in the priority development of group settlement systems, connected by transport, engineering infrastructure, cooperation of industrial and economic relations.

The tasks of development of urban areas are currently evident in environmental problems associated with high anthropogenic impact on the environment, in the demand of the population for individualization, ergonomics and comfort of housing.

Solving these problems requires a systemic integrated approach. The problem of financial accessibility of individual, eco-friendly and comfortable housing comes to the fore. The solution should be found in a synergetic effect from the interaction of state authorities and business, as a reaction to environmental problems and the emerging demand from the population.

Housing construction serves the satisfaction of the social needs of the population, which make demands for individual, economical, environmental friendliness and energy efficiency of the urban environment. Such requests are related to the desire of the urban population to live in an ecologically clean and convenient system, which is practically impossible with the existing level of environmental pollution. Foreign practices in the implementation of the climate change strategy are closely linked to energy innovations, the introduction of renewable energy

technologies and the observance of the balance of energy consumption and production, which ultimately should ensure an increase in the efficiency of the use of urban areas and optimize spatial architecture, thereby ensuring the formation of a sustainable demand for energy-efficient housing, providing for intelligent management.

The development of urban areas involves the improvement of existing and the search for new mechanisms that ensure the successful achievement of the transformation of the urban environment. One such mechanism will be project financing for housing construction, which is actively used in other sectors of the economy.

### **Methodology**

This research is aimed at justifying the use of project financing in the implementation of residential development in urban areas to increase the availability of eco-friendly, individual, comfortable housing. Under the ecology of housing we will understand the economy, environmental friendliness and energy efficiency.

For the analysis of the situation in the housing market, the following methods are used: the analogy method and the diagram method, reflecting the cause-effect relationships and allowing to reveal the dynamics of changes, the established trends, the interrelations of quantitative and qualitative indicators. To create an objective dynamic picture of the development of housing construction and development of the construction industry, as well as to form a comprehensive view of the price situation and affordability of housing we used methods of statistical analysis. To compare the quantitative values of indicators with the generally accepted norms (the establishment of legislative and regulatory acts of the processes, procedures, interactions between participants in financial investment and construction processes), methods of comparative and normative analysis are used.

### **Measurement and analysis**

Currently, there is a new structure of the needs of consumers observed in the housing market, taking into account the requirements of a new generation of consumers. In this context, a format such as the organization of urban housing construction in the form of project financing will create conditions at all stages of the implementation of projects for the introduction of energy-efficient living space and become a new vector for the development of urban areas considering the possible risks for the project company participants (Göçmen, 2014; Krygina, 2015; Zaguskin, 2013; Lian & Zhao, 2107).

During the development strategy establishment, special attention should be given to such parameters as individualization of housing, environmental friendliness, ergonomics and comfort. As foreign researchers (Göçmen, 2014) note that the strategies for encouraging the most environmentally sustainable models for the development of territories include: the provision of the most favorable institutional environment, the development and adoption of rules for the protection of natural resources, and the continuous improvement of environmentally sound development. According to the author (LeeWon Park 1 ID, 2018), in the early stages of designing smart homes, priority was given to the user-friendliness concept, but nowadays energy efficiency and economic efficiency are becoming increasingly important. Another problem is that with the increase in the cost of energy resources, the problem of energy efficiency becomes critical, considering that Russia is the 10<sup>th</sup> in the world for energy waste (Zaguskin, 2013).

Analysis of statistical data allows us to conclude that the pace of housing construction in the country is quite dynamic and has recently grown significantly. Experts predict that the demand for real estate will be increasing (Fig. 1).

At the same time, it should be noted that the housing market dictates its conditions, which in modern realities are determined by the key parameters: demand - supply, cost - purchasing power. With this model, the opportunity to increase sales of housing under construction in most cases depends on the ratio of cost per square meter and the level of income of the population.



Figure 1. Dynamics of construction of residential real estate in Russia, million m2

The quality of housing development in the context of environmental and energy efficiency is completely ignored and goes against the main objective of the program “Providing affordable and comfortable housing and public services for the citizens of the Russian Federation and creating a comfortable urban environment” to decrease the cost per square meter (Krygina, 2015; Zaguskin, 2013).

According to KPMG experts, the factors that determine the innovation, i.e. the cost of materials, currency risks, equipment, are most significantly influencing the cost of construction.<sup>1</sup>

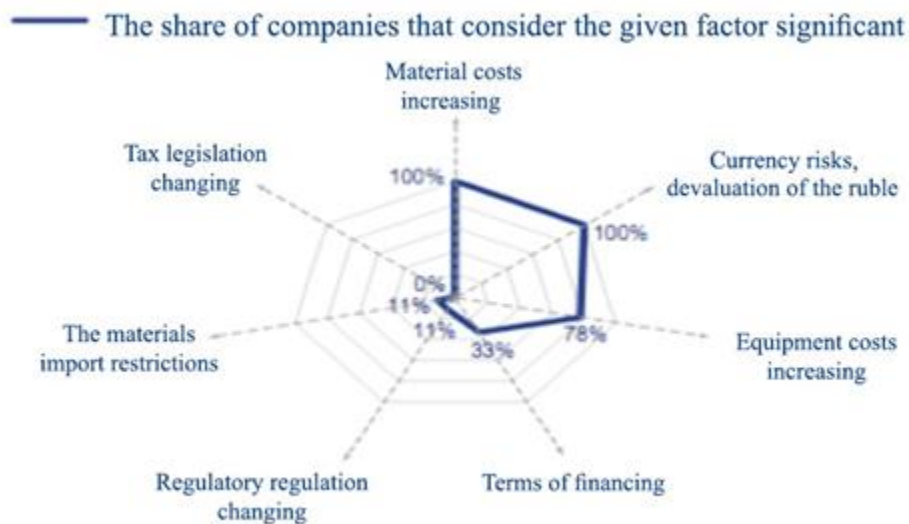


Figure 2. Key factors of construction costs change in 2014-2016

In the segment of housing in Moscow, a stable share of the main cost items - engineering networks (26% in 2016) and construction works (44% in 2016) was observed.

The formation of demand for individualization (both non-volatility including), environmental friendliness, energy efficiency, ergonomics and comfort is formed through two significant contents:

Requests from the modern population, urban type, the so-called generation Y, which prefers a reliable “smart space”, with a small area. Compared with other countries, the Russian Federation is characterised by a high proportion of one- and two-bedroom apartments in the housing stock (Fig. 5).

<sup>1</sup> Overview of construction and construction materials costs in Russia, January 2017, KPMG in Russia and the CIS

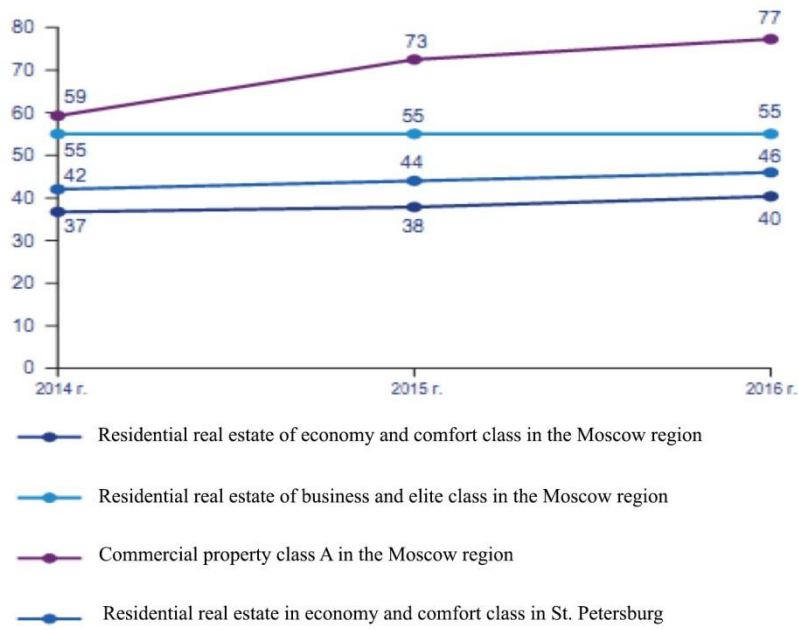


Figure 3. Dynamics of the average cost of construction in 2014-2016, rubles per square meter

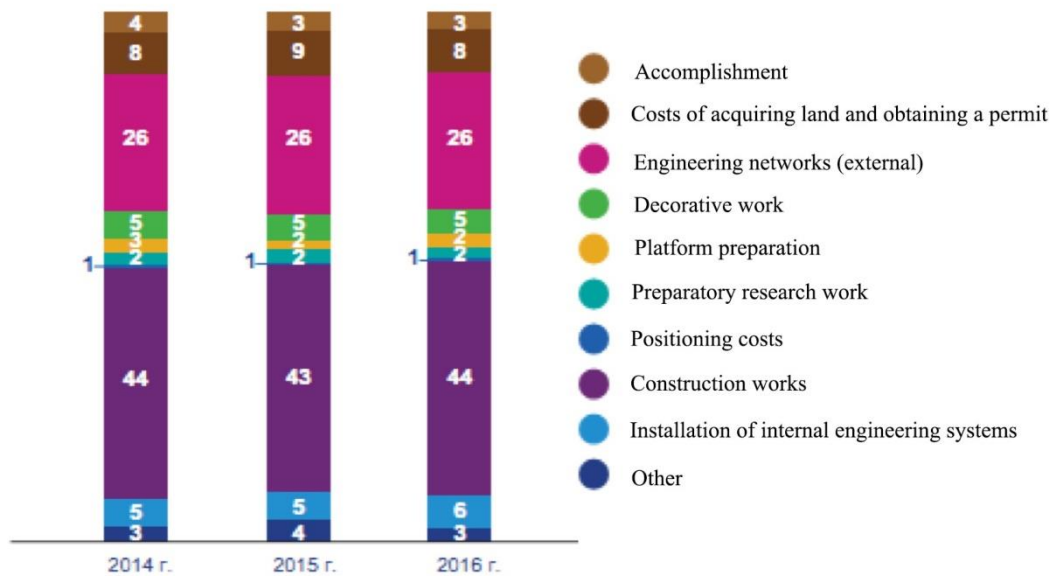
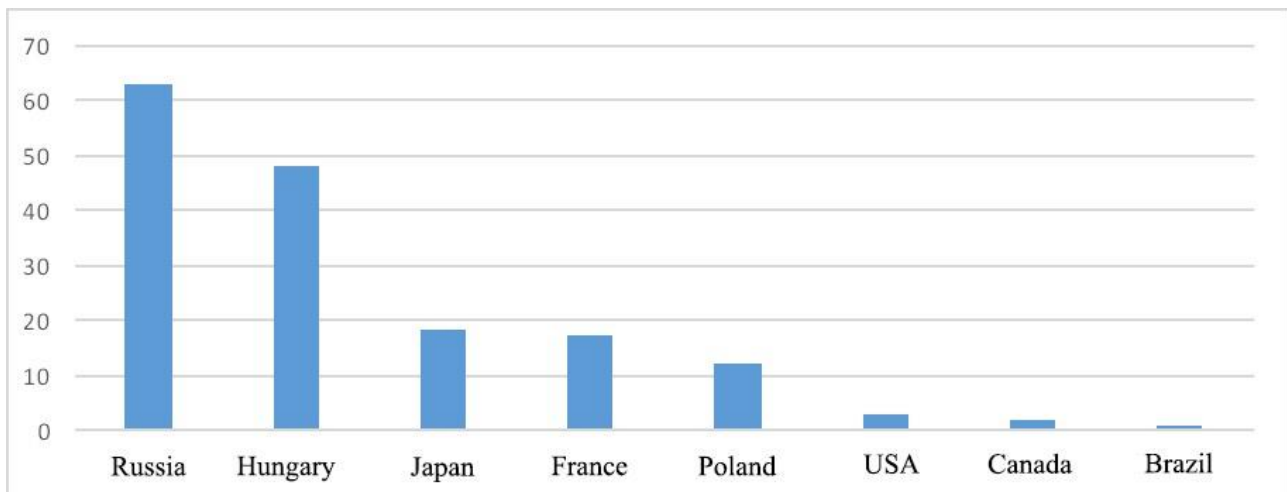


Figure 4. Dynamics of the cost structure of housing construction in Moscow, %

2. Understanding by the state of the necessity of greening residential space in order to solve a serious problem of the anthropogenic impact on the environment, and as a result, its degradation (Krygina, 2015).



According to [https://dom.rf/wp-content/uploads/2016/04/AHML\\_17-let\\_2017.12.11.pdf](https://dom.rf/wp-content/uploads/2016/04/AHML_17-let_2017.12.11.pdf)  
Figure 5. Share of one- and two-bedroom apartments in the housing stock, %%

Thus, the survey of satisfaction with the urban environment<sup>1</sup> showed that the factor “Ecology of the city” is the most important factor of the urban environment for comfortable living in the first place.

The intersection of these two contents results in a huge problem and is a challenge to the existing system of housing construction and the construction industry as a whole.

Therefore, the search for the answer to the challenge in our country has already started and it is reflected in the following directions of implementing the housing policy:

the global trends in housing construction are shifting towards “green building”, which is reflected in the implementation of standards of national systems of voluntary standardization of facilities and certification of buildings in accordance with these requirements (BREEAM, LEED, DGNB (GSBC), STO NOOSTROI 2.35.68 - 2012 in Russia);

popularization and dissemination of the energy literacy of the population, rather as the need to reduce the fees for consumed housing and communal services, creates a demand for individualization of housing and communal services, the need for individual consumption/expenditure and as a result, savings on such costs (non-volatile equipment, energy efficiency and alternative housing provision systems communal services, so-called “smart house” systems) (Krygina, 2015);

the desire of the state to regulate/stimulate the solution of the problem of the quality of residential development in the direction of ecologization, energy independence and energy efficiency, by creating a regulatory framework in the field of compliance with environmental requirements in construction (Zaguskin, 2013).

Implementation of such directions promotes the increase of socioeconomic and ecological priorities of the population. Nevertheless, the implementation of such projects requires the availability of sufficient resources, including financial resources. On a global, world-wide scale, the prevalence of socioeconomic and environmental priorities, considering the structured sources of financing, has led to the formation of the green economy concept, which is a resource-saving, carbon-reducing, socially inclusive economic model aimed at diffusing the three components - social, natural and economic.

Priorities of the “green economy” are formed by “green” trends in all sectors and spheres of our life. Thus, the term “green building/construction” is actively used in housing construction, and many attempts are being made to stimulate it. For example, organizations are exempted from paying property taxes during the first three years in relation to newly introduced facilities with

<sup>1</sup> VTsIOM [https://дом.рф/wp-content/uploads/2016/04/AHML\\_17-let\\_2017.12.11.pdf](https://дом.рф/wp-content/uploads/2016/04/AHML_17-let_2017.12.11.pdf)

high energy efficiency or a high energy efficiency class (according to the list of the Government of the Russian Federation). However, this privilege is not provided for individuals, at the same time, it is stipulated that “green construction” should be implemented in the part of the housing stock. The introduction of such a mechanism would allow stimulating an increase in demand for energy-efficient, eco-friendly housing, and as a result, stimulation of “green building”.

One of the obstacles in promoting “green construction” is the lack of awareness of the principles and advantages of such a development, which in turn does not ensure the formation of the necessary demand. An important role in this task can be played by effective advertising, both commercial and social.

Commercial advertising, despite the increase in prime cost at the initial stage of the project launch, will further increase the demand for housing, and in the long term, along with social advertising, will create the culture of demand for energy-efficient, comfortable, high-quality housing.

Energy-efficient housing, providing for intellectual management, will allow to regulate the operating costs of each owner depending on individual needs. In foreign practice, there are developments on the introduction of an electricity transactions ecosystem, which provides transactions between users and consumers. This platform is based on the blockchain peer-to-peer (P2P) technology and is an effective deal for the use of electrical energy. The payback of the introduction of the eco-platform is about four years (LeeWon Park 1 ID, 2018).

The current economic system, which allows to ensure the growth rate of construction, contains a high level of risk, which manifests itself in the unfair execution of the cost-sharing arrangement contracts, and forms a high level of social tension.

The application of the concept of housing construction in the format of project financing is justified by the fact that energy-efficient, energy-safe green buildings are investment projects with high-risk parameters. In such cases, project financing is most adaptively adjusted to the high-risk project implementation environment, taking into account both external and internal risks.

Currently, most of the projects in the field of housing construction in the Russian Federation are implemented through the cost-sharing arrangement contracts, with the help of equity holders. Over the next three years, it is planned to implement a phased transition to the project financing mechanism, which has existed for a long time in other countries, thus, developers will not be able to use the means of co-investors to finance construction.

We will analyze the conditions that form the environment for the implementation of project financing at the current stage of solving the problem of stimulating “green construction” for the effective development of urban areas. For Russia, the form of housing development in the format of project financing/support is relatively new. At the legislative level, new conditions are created to phase out the financing of housing construction under the cost-sharing arrangement contract and transition to project financing. The requirements for developers have seriously tightened: work experience at least 3 years; the number of built housing is not less than 10 thousand m<sup>2</sup>; requirements for organizational and legal form - only business entities, public joint stock companies, joint-stock companies and limited liability companies; the presence in the name of the company of the phrase “specialized developer”. Thus, the entry of new developers into the market with this approach will be very difficult, which can adversely affect the competition in the field of housing construction.

The principle – “one builder - one building permit” is introduced, from July 1, 2018 it will not be possible to build (create) apartment buildings and other real estate objects simultaneously for several building permits, which will prevent the creation of “financial pyramids”, but also the complex development of the territories will become practically difficult, since the construction of infrastructure facilities outside the building site will not be possible.

The requirement to the minimum amount of own funds from the developer is introduced: 10% of the planned project cost of construction.



At the institutional level, a tool has been created that is designed to monitor the financial status of developers attracting citizens' funds through the cost-sharing arrangement contracts - the Fund for the Protection of Citizens' Rights - Participants in Equitable Construction (Compensation Fund). The organizational structure of control in the sphere of shared construction with the assignment of powers to the bodies of state construction supervision has also been reformed.

Another organizational tool is the introduction of special accounts by ESCROW in an authorized bank. Scheme of interaction of participants is shown in the Figure 6.

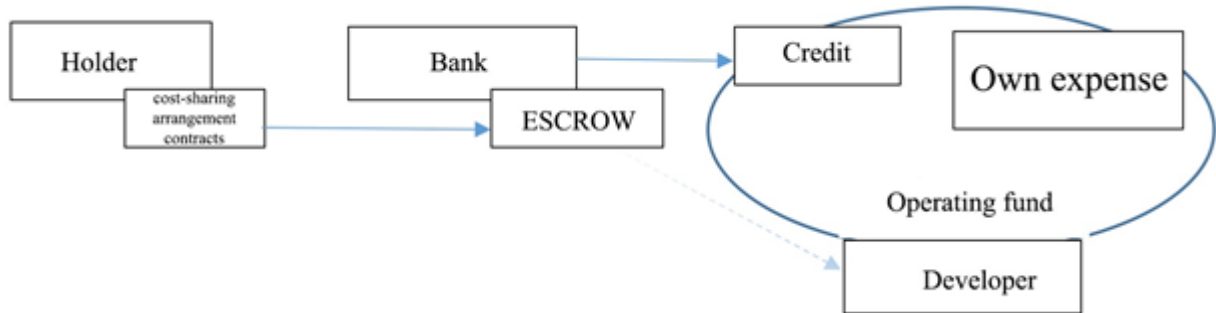


Figure 6. Financing scheme in conditions of using ESCROW accounts

When the construction is completed, the funds from these accounts are transferred to the developer, thus acting as an analogue of the letter of credit. The developer constructs at their own expense or by credit.

Another institutional tool is the creation of authorized banks to finance housing construction, which will make targeted bank lending to developers more affordable, including through the impact of two key factors in the financial market of the Russian Federation: a reduction in the Bank of Russia's key rate to 7.25% (April 01, 2018), reduction of annual inflation (at the end of 2017) to a record low.



Figure 7. Dynamics of the key rate and inflation, %

Thus, at present, the incentive mechanism for “green building” is formalized in a triune system and is shown in Figure 8.

In the incentive mechanism, all three components remain not well developed. As already noted above, attempts are being made to tax incentives: such a tool refers to the financial and economic leverage. Socio-ecological instruments, such as environmental monitoring, environmental auditing and environmental risk assessment, are applied in a rather limited form and, in most cases, to industrial buildings. In the socio-environmental instruments, it is also necessary to add an increase in the energy literacy of the population. Such a tool will have a

stimulating effect on the demand from the population for eco-friendly housing. Budgetary instruments, such as subsidizing interest rates, are also not currently applied to “green houses construction”.

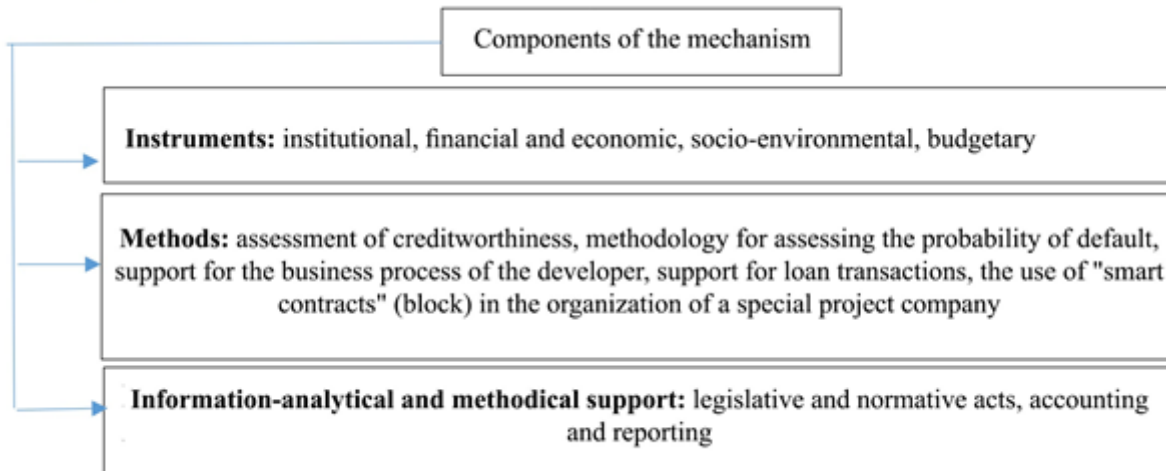


Figure 8. Mechanism to stimulate “green building” as a vector of development of urban areas.

The component “methods” are better developed. Thus, not only the use of “smart contracts” remains unplanned, other methods are used to organize business processes of developers as necessary aspects of financial relationships.

The high-priced process and technologies that create and enhance the environmental friendliness, ergonomics and comfort of housing are quite expensive for the current stage of development of the construction industry in Russia. The limited ecological, energy-efficient, energy-saving resources and technologies cause their high cost. Ecologization of the economy, development and implementation of innovative materials (let us call them resources), energy-saving technologies, energy security and energy independence of housing and human life is selective - not mass demand - therefore involves increased costs and high costs.

The demand from new generations, the need to prevent environmental degradation, requires justification and implementation of a system providing accessibility of housing with these characteristics. Solving the problem of accessibility will lead to increased demand. Moreover, we do not exclude the solution of this problem not by an evolutionary but, perhaps, a compulsory way. The market concept will lead to the opposite effect in today’s situation, i.e. a reduction in demand.

Since it is not possible to ensure the availability of eco-friendly housing in the short-term period by reducing the cost per square meter, objectively ensure the stimulation of demand through the implementation of an effective mutually beneficial financial and credit mechanism linking the producer of housing and the consumer.

At present, such a financial and credit mechanism is supported by the main instrument, such as housing lending and mortgage. Figure 9 shows the quantitative dynamics of mortgage in relation to existing lending institutions.

Over the past decade, in our country, it has been possible to form a certain level of confidence in the purchase of housing in the primary market. This situation was facilitated by the introduction of the Federal Law No. 214-FZ in 2004. However, this regulation did not allow to completely protect the population from fraudulent schemes and the country’s economy from the problem of “deceived co-investors”. The VTsIOM (Russian Public Opinion Research Center) survey showed that the readiness to purchase housing under construction through the cost-sharing



arrangement contracts decreased by 15% (from 34% in 2015 to 19% in 2017).<sup>1</sup> At the same time, the study of demand at the stage at which the consumer is ready to buy housing in the primary market showed that the risk of lack of ownership is predominant: 33% of respondents are ready to purchase housing only when this is right and 20% of respondents are ready to buy housing at the key issuance stage. Thus, it is clear that with certain guarantees that the demand in the primary market will increase. According to the research, the increase in demand for the provision of state guarantees at each stage of construction grows (from 5% at the stage of the project declaration, up to 12% at the stage of keys transfer).

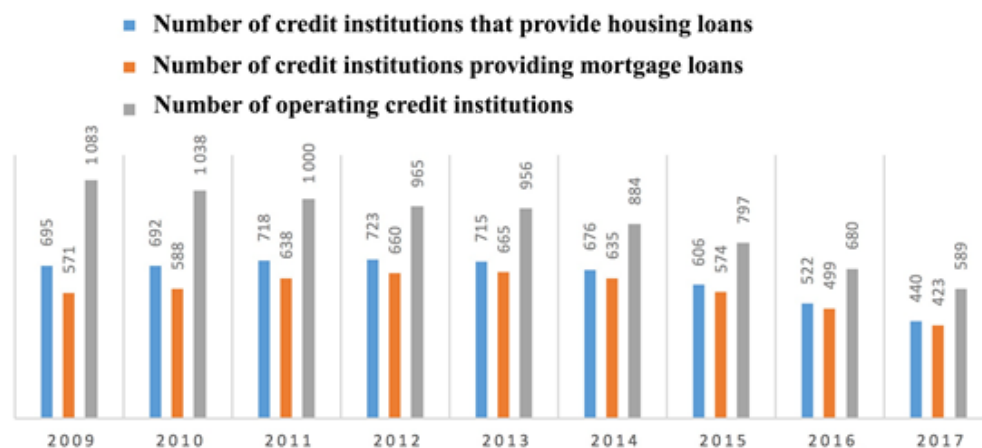


Figure 9. Dynamics of the number of issued loans for the purchase of housing<sup>2</sup>

In general, when the state provides guarantees of timely completion of construction, demand through the cost-sharing arrangement contracts grows 1.4 times from 350 million m<sup>2</sup> to 490 million m<sup>2</sup>. Under the conditions of the current Federal Law No. FZ-214, the demand at the stage of initial site works and below is only 7%. When granting state guarantees for the completion of construction, it increases by 3 times to 22%. The element of guaranteeing the transaction will be provided fairly well in the implementation of development in the form of project financing.

Analysis of the availability of housing on the mortgage in the context of the regions will illustrate the possibility of the most effective regional stimulation of the demand for eco-friendly housing. Figure 10 shows a cartographic representation of the availability of housing.

There is high concentration of availability in the Yamal-Nenets district, in the Murmansk region, in the Far East. Regions with concentration by natural conditions are favorable for large-scale use of alternative energy sources, which is an additional factor in stimulating “green building”.

A few key parameters that can provide project financing in green construction projects: the form of ownership of the building site, the relationship between the participants in project financing on the allocation of risks, the structuring of sources of financial resources.

In project financing, as in other forms of project implementation, the stages of the project life cycle are significant. The complex interaction of all participants of project financing in the organization according to the scheme “without recourse to the borrower” is shown in Figure 11.

1. Development of a business plan and preparation of project documentation.
2. Contribution of interested investors (co-investors) to the project.
3. Contribution of the project initiator’s own funds, own capital to the amount necessary to cover operational costs + covering% of payments on the loan (can be carried out both in cash and in property (liquid assets held by the initiator)).

<sup>1</sup> VTsIOM [https://дом.рф/wp-content/uploads/2016/04/AHML\\_17-let\\_2017.12.11.pdf](https://дом.рф/wp-content/uploads/2016/04/AHML_17-let_2017.12.11.pdf)

<sup>2</sup> According to Russian Federal State Statistics Service (July 01, 2017)

4. Project financing (the authorized bank provides financing for the project at the conditions agreed with the initiator earlier).

5. Payment of interest to the authorized bank at the expense of cash flows generated by the green construction project.

6 and 7. Insurance companies carry out insurance of credit risks of the authorized bank and technological risks of the project company in case of limiting the possibility of securitization or in addition to using securitization.

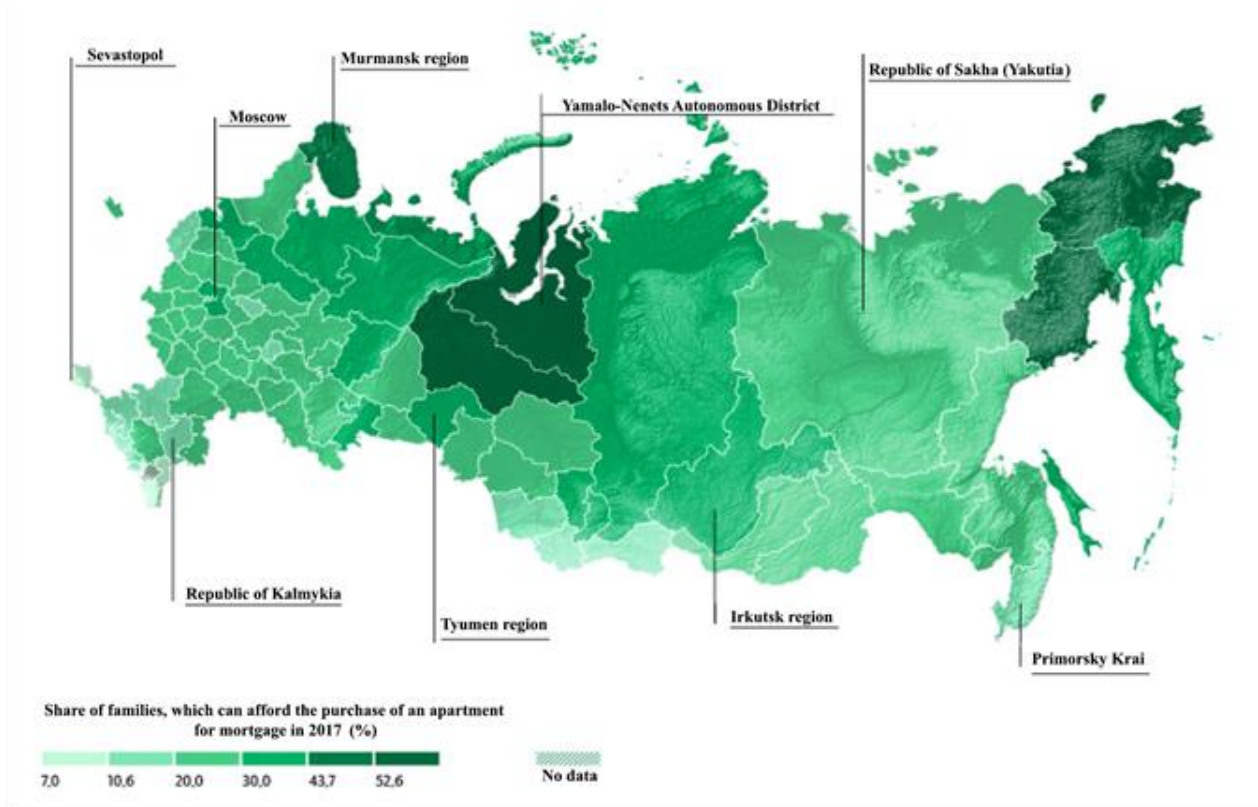


Figure10. Rating of regions on affordability of housing purchase by families using mortgage  
Source: RIA rating <http://riarating.ru/regions>

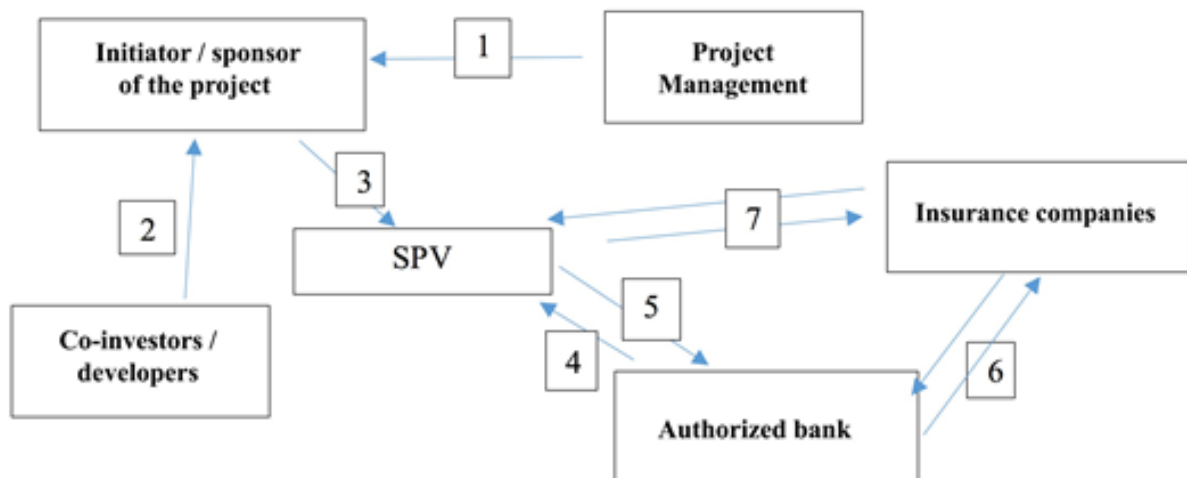


Figure 11. Organization of residential development in the form of project financing

As was justified above, the formation of mass demand for housing development with the required indicators is the bottleneck, which is a source of increased risk in such projects. When implementing such construction projects for developers, participants of the SPV (Special Purpose Vehicle) will be entrusted with the risks of ensuring a guaranteed demand for housing. In this case, the principle of “taking risks” is implemented, i.e. a conscious acceptance of the risk of a negative outcome of events and a willingness to cover losses from own funds. In reality, such acceptance of risks is expressed in deals on redemption by developers of a certain number of future apartments in residential buildings.

The source of additional demand for housing with comfortable non-volatile parameters will be the segment of the younger generation, this is the so-called generation Y, for the quality of housing is the dominant feature. The choice will firstly depend on housing, which on the one hand is reliable, “smart”, and on the other hand, residential space may not be large, but necessarily, isolated. The reason is not only the propensity to consume innovative and comfortable products, but what is very important in this case is a positive attitude towards financial and credit mechanisms. In the age groups of 18-24 years, 25-34 years, respectively, 40 and 45% of respondents answered that “they will necessarily take a mortgage/thought about taking a mortgage”. While in the age groups of 35-44, 45-59, and more than 60 years, positive responses were distributed: 32%, 20% and 8% of the respondents.<sup>1</sup>

The participation of insurance companies in project financing implements the principle of “transfer of risk”. The conclusion of a contract with an insurance company involves the transfer of costs/losses to a participant in project financing and is usually expressed in the insurer’s obligation to pay damages.

The principle of “risk management” is implemented in project financing through the consistency of actions of all participants through the methods of assessment and monitoring agreed upon when concluding project contracts and agreements. Such methods were shown in Figure 8 of this paper.

In foreign practice, the organization of construction projects in the format of project financing is large enough. Thomson Reuters analytical review illustrates the world practice of implementing projects in the format of project financing at the beginning of 2017, from which it is evident that 3.1% of all project finance is realized in the Leisure & Property sector. In terms of the three regional markets - American, Europe, Middle East and Africa, and the Asia-Pacific region (including Australia and Japan), the following picture can be observed: the share of ongoing projects in the Leisure & Property sector is 0.4% of all projects, 4.3% and 3.6% of projects, respectively. A fairly large share, which indicates the popularity of this format of business organization. In Russia, the capacity of the construction market is quite high: at the macro level, the indicators of the construction industry are of great importance in the development of the national economy: 7.2% of the economically active population are engaged in the construction sector, its share in GDP is 5.6%.

The use of the most successful foreign practices of applying project financing in the construction sector and, in particular, residential development, modification of the components of the incentive mechanism for “green building” will enable in the medium term to increase demand for eco-friendly housing, thereby adjusting the development of urban areas towards eco-friendliness and comfort.

## **Conclusion**

The conducted study of the features of the mechanism of project financing in urban housing construction, as a new vector of development of urban areas, allows us to draw the following main conclusions.

The development of urban areas requires a principled change in the organization of resettlement, including residential development, which is associated with the problem of

<sup>1</sup> VTsIOM [https://дом.рф/wp-content/uploads/2016/04/AHML\\_17-let\\_2017.12.11.pdf](https://дом.рф/wp-content/uploads/2016/04/AHML_17-let_2017.12.11.pdf)

environmental degradation and the formation of demand for individualization and environmental friendliness of housing by the urban population. The cost of energy resources has a significant impact on the demand for smart technologies used in everyday life and ensuring the ecological compatibility of housing. In Russia, the urgency of stimulating such demand is high due to a critical level of energy waste compared to other countries.

A market approach to stimulating “green construction”, designed to transform the organization of urban areas, cannot lead to a positive effect due to the high cost of housing that meets the ideas of environmental individualization. Analysis of the structure of the cost per square meter shows that the most significant items in it are the cost of materials and the construction of engineering networks (external). These components directly reflect the obstacles to lowering the cost of “green construction”: the infrastructure of the so-called “smart house” technologies presupposes the availability of quality engineering networks, and eco-friendly materials are quite expensive.

The solution of the problem of development of urban areas is reflected in the state housing policy, and assumes a significant increase in the effectiveness of the incentive mechanism for “green construction”. The inadequacy of the tools, the inferiority of information, lack of analytical and legislative support significantly impedes the possibilities of transforming urban areas, postponing the solution of this problem for the medium and long term.

The continuing high level of risk of housing construction also acts as a constraint on the further qualitative development of the urban environment, including the issue of defrauded co-investors that remains unresolved.

Limited resources, including financial ones, do not allow to stimulate the demand of the population for ecological development. Indicators of the level of housing affordability in mortgages (the only effective tool in the mechanism for stimulating housing development) illustrate the regional segmentation favorable for use in energy supply of housing construction with alternative energy sources, which will be an additional incentive for the development of “green construction”.

A phased transition to the format of the organization of housing development in the format of project financing is aimed to solve the above problems. Project financing allows to evaluate the project in terms of viability, efficiency, security and risks. For developers, this form can significantly simplify the mechanism for attracting cash, for consumers and the state - reduce risks through a maximally transparent procedure for all aspects of construction.

A wide range of professional participants, the distribution of project risks, a quality contractual structure of projects, effectively implement the “green construction” projects in the medium and long term. The most significant risk - ensuring demand for ecologic, individual and comfortable housing - will be taken by the younger generation, prone to innovative energy-efficient solutions in the organization of residential space of a small area.

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