Public private partnership as a housing development tool

N V Shvydenko*, A A Axenov, E V Vinogradova, L A Seferyan
Don State Technical University, 1, Gagarin sq., Rostov-on-Don, 344000, Russia

E-mail: 93281105@mail.ru

Abstract. The article discusses the prospects for the public-private partnerships’ (PPP) development in relation to solving the housing problem. The thesis on the need to form the organizational, legal and financial foundations of the PPP mechanism for the mass construction of affordable, comfortable and ecological (“green”) housing, including integrated territorial development, is consistently put forward. The scientific results of the study include the strategic objectives’ formulation for improving PPP in housing construction in the Rostov Region, the rationale for creating a coordination center for supporting the PPP projects, the proposed algorithm for selecting the PPP projects based on a criteria system for evaluating the effectiveness of green housing projects, including the environmental, social and economic indicators.

Introduction

According to the estimates of the National PPP Center, 302 potential PPP projects are currently being prepared for launch in the Russian Federation, the potential volume of which is 1041.1 billion rubles. Large federal projects are at the initiation stage. In the future, mechanisms of public-private partnerships can make massive money in the framework of national projects. In total, up to 2024, national projects will need 7.5 trillion rubles of private investment. For this, the experts believe, it is necessary to create a transparent and understandable legal and organizational framework for financing PPP projects, taking into account the peculiarities of their budget planning, competitive procedures, deadlines for implementation and reporting, etc. [1,2,3]. At the same time, the scope of using PPP tools is not limited only to the regional infrastructure development. The projects are also being implemented in such areas as education, culture, healthcare, tourism, etc.

The sharp increase in the PPP projects’ volume is caused by the legislation development and the market entities interest in applying this mechanism to improve infrastructure. The crisis also influenced such dynamics, since the shortage of financial resources arising from the economic shocks pushes us to look for the alternative tools and ways of financing social and infrastructure projects.

The state plans to solve the problem of improving the living conditions of the population by means of the targeted housing programs based on increasing the economy-class housing construction volume. However, satisfaction of housing needs of the population remains high. A further increase in the pace of construction and a corresponding increase in industrial investment are required. The financial difficulties of construction enterprises due to the crisis losses in the Russian economy, the ineffective structure of funding sources, determine the relevance of assessing the effectiveness of the targeted housing programs’ implementation by the state. The studies conducted cast doubt on the operability of the shared construction and mortgage lending mechanisms [4].

Content from this work may be used under the terms of the Creative Commons Attribution 3.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.
Published under licence by IOP Publishing Ltd
The urban areas’ planning features indicate that a transition is currently underway from the housing development “point” to the development of increasingly vast territories for the territorial integrated residential development construction. The most relevant instrument of regional public-private partnership in housing construction is precisely the “integrated territorial development”, which is the implementation of local investment projects in a certain territory, which reflect the aggregate interests of business and the state and take into account the guaranteed provision of this territory with all the necessary infrastructure elements [5]. An example is the implementation of the project for the integrated development of the Akademichesky territory in Yekaterinburg for 325 thousand residents using the public-private partnership mechanism.

**Purpose, tasks, research methods**

In modern conditions, an increase in the construction enterprises activity scale negatively affects the environment, as resource consumption increases and ecosystems are gradually destroyed. In our opinion, solving the problem of providing the population with affordable and comfortable housing is potentially advisable by means of the residential ecological (“green”) real estate development through the public-private partnership use [6].

The demand study in the housing market indicates an increase in the demand from consumers to increase the socio-ecological comfort of modern housing, which, in addition to solving the housing problem, will simultaneously reduce the environmental problems of the cities.

The PPP tools’ analysis in the Rostov region made it possible to formulate the strategic objectives for improving the PPP mechanisms in housing construction in the Rostov Region [7,8,9]:
- optimization of the legal framework for the PPP mechanisms’ functioning, bringing it into line with real processes in the investment and business sectors;
- formation of the various levels of the government bodies effective interaction model with regional business entities, public organizations, regional clusters and research centers to optimize the forms and mechanisms of PPP;
- increasing the economic and social efficiency of the public-private partnership projects’ implementation in the region;
- the creation of specialized educational structures to improve the civil clerks’ skills in the implementation of forms and instruments of public-private partnership in the region;
- improving the institutional framework, providing state support to private investors, attracting new investors to industrial parks and regional investment sites.

Currently, a comprehensive approach to solving the problems of investing in housing construction is required, which will allow developing a comprehensive financial support system, creating a system of all kinds of forms, methods and tools for managing the modern energy-efficient housing construction.

**Organizational, legal and financial basis for the PPP mechanism formation in housing**

In the Rostov Region, the PPP mechanisms’ formation and implementation has been deliberately and consistently carried out since the economic conditions’ creation and the regional PPP projects’ legal regulation foundations that are consistent with the strategic development of the Rostov Region.

For 2010-2019, the necessary regulatory and legal framework was developed, which is necessary for the practical implementation of public-private partnerships in the most important spheres and sectors of the region - housing and communal services and urban economy, construction and reconstruction of socially significant and infrastructure facilities, as well as environmental safety [1, 7,8,9]. However, the prevailing number of PPP projects today is still concession agreements, they occupy a share of 87% of the total number of such projects.

In the Federal Law of July 13, 2015 No. 224-FL, infrastructure facilities prevail among the PPP facilities and there is no housing construction. Thus, in our opinion, the adopted federal law is an administrative and legal barrier to attracting private investment in housing construction.
The main law advantages should be noted: the possibility of pledging an infrastructure facility to finance a project; the requirement abolition of the binding model agreements approved by the government of the Russian Federation; the possibility of concluding direct agreements with project investors.

At the same time, among the shortcomings the following can be distinguished: a very limited range of partnership models prescribed by law; the obligation of municipalities to coordinate the PPP projects with the authorities of a constituent entity of the Russian Federation; tight deadlines for concluding the PPP agreements; a limited range of cases where several public entities are on the side of the state. The mechanism of the private PPP initiative is reflected in the law in a limited form: the private partner does not receive any advantages in the investors’ competition, there is no provision for reimbursement of the project preparation stage’s costs in case of fail in the competition.

In order to optimize the PPP mechanisms in the Rostov region, it is necessary to create a coordination center for PPP development, which target orientation should be aimed at selecting and structuring the promising investment projects that contribute to the long-term development of the Rostov region, providing consulting, legal and organizational support for the projects, preparing tender documentation and holding tenders, as well as support for the PPP projects for the entire period of their implementation.

To increase the effectiveness of the PPP projects implemented in the constituent entities of the Russian Federation, not only economic analysis based on statistical data should be carried out, but also such areas as: socio-economic evaluation of project implementation results should be implemented; assessment of the regional authorities’ performance in the field of PPP project management; assessment of the effectiveness of the current regulatory framework governing relations arising in the framework of public-private partnerships; public examination of project implementation.

In accordance with a number of regulatory legal acts and the Decrees of the Government of the Rostov Region, we have developed an algorithm for the PPPs selection for housing projects based on the assessment of the socio-environmental and economic effectiveness of green construction projects (Figure 1).

![Algorithm Diagram]

- Selection of PPP housing projects based on their ranking
- Formation of a PPP project program and approval of their financing schemes
- Clarification of space-planning, design solutions and technical and economic indicators of PPP projects
- Calculation of an indicators system of socio-environmental and economic assessment of PPP housing construction project:
  1. PPP project commercial performance indicators
  1.1. The system of the economic efficiency international indicators of the projects based on discounting
  1.2. Methodology for calculating the life cycle of a residential building, taking into account the total costs
  1.3. Indicators for the investment situation analysis through the integration of private and public financing sources
  1.4. Indicators for assessing socio-environmental and economic risk as a measure of compliance with the quality level of a residential property
  2. Is the PPP project effective?
- Accounting and monitoring the implementation of the program
- Revision of the initial data of a PPP project based on the coordination of the state, private investors and the public interests
Figure 1. Algorithm for the PPP projects selection for the construction of energy-efficient housing and their financing organization

The key performance indicators should reflect the achievement of economic, social and environmental goals that have been set for the specific public-private partnership projects. The set of the key performance indicators is not universal, but is determined individually for each project. At the same time, it is important to limit the number of indicators used so that the effectiveness assessment is, on the one hand, comprehensive, and on the other hand, not too labor-consuming and costly [10, 11].

Experimental part
Analysis of the PPP projects’ statistical data for the housing construction projects for 2008-2019, collected by the relevant department in the Ministry of Economic Development of the Russian Federation, indicates a very small number of completed projects under the PPP with the participation of the Russian Federation in housing construction (Table, Figure 2) [4,12].

However, the analysis of the data presented confirms the high interest of the business in participating in the PPP-based housing projects’ implementation, which is expressed in their performance as the main investor. Based on the results of previous studies, it can be concluded that the public investment proportion in PPP projects throughout the country is approximately 34%, the remaining 66% of the investments are made by the private investors [1].

Moreover, the ratio of public and private investments largely depends on the industry in which a particular project is being implemented: the more profitable the investment in the project, the higher the share of private financing, which can reach 84-87%.

Table 1. Construction projects of residential facilities on the basis of public-private partnership with the participation of funds of the Russian Federation (former Investment Fund).

| No. | PPP Agreement Object |
|-----|----------------------|
| 1   | The construction of five residential buildings with a total area of 134 thousand square meters in the Republic of Bashkortostan (2008-2011) |
| 2   | Construction of a residential area of low-rise buildings “Novoland” and the socio-cultural infrastructure in the Krasnoyarsk Territory (2008-2014) |
| 3   | The construction of mass low-rise buildings (1500 houses with an area of over 130 thousand square meters), three kindergartens and shopping centers, cultural, medical and sports facilities with utilities in the Kaluga Region (2008-2019) |
| 4   | Construction of residential facilities on the complex development territory in the Chuvash Republic |
| 5   | Commissioning of four residential block sections and office premises in the Belgorod region (2009-2015) |
| 6   | Construction of the fiberboard plant building and two 32-apartment residential buildings in the Smolensk region |
| 7   | Construction of the residential real estate complex and the multidisciplinary sports complex Avtodrom (Simbirsk Ring) in the Ulyanovsk Region (2009-2013) |
Figure 2. Projects for the residential facilities’ construction based on public-private partnership with the participation of funds of the Russian Federation (former Investment Fund)

More than a billion and a half rubles annually are provided for the PPP projects’ implementation in the state program of the Rostov Region “Economic Development and Innovation Economy” [3].

In the Rostov Region, as a result of the list introduction of “100 Governor’s Investment Projects” from 2011 to 2016, 106 investment projects were included, 44 of which have already been commissioned. In 2017, 12 projects with a total investment of 61.1 billion rubles were put into operation, the implementation of which allowed creating 4,629 new jobs in the Rostov Region. In 2018, the region increased the public-private partnerships development level by 17% (from 50.4% to 67.4%).

According to the regions’ ranking in the Russian Federation, the Rostov Region took the 27th place in terms of the PPP development level for 2018-2019. Among the subjects of the Southern Federal District, Rostov Region takes the first place.

As of the beginning of 2019, the implementation of 143 public-private partnership projects with a total investment of over 104.0 billion rubles [9] was ensured in the Rostov Region. At present, in the Rostov region, the project “A comprehensive program for the construction and reconstruction of water supply and sanitation in Rostov-on-Don and the south-west of the Rostov region” using the PPP model is being implemented. The project aims to develop the water supply and sanitation infrastructure in Rostov-on-Don and in the south-west of the Rostov Region, to improve the quality of water supply and sanitation services, and to reduce the negative impact on the river. Don, Azov and Black Seas. The approved estimated cost of the project is 33,470.77 million rubles, including financing from the Investment Fund of the Russian Federation in the amount of 6660.29 million rubles. The deadline for the implementation of the project is 2007–2021 [12]. The joint implementation of the KORTROS Group of Companies with the Administration of the Rostov Region is planned to comprehensively develop the territory of the former airport in the eastern part of Rostov-on-Don. This project is based on the environmental development principles.

Summary
Thus, based on a brief analysis of PPP projects for 2000-2019 and taking into account the relevant documents, problems and obstacles to the PPPs development in housing construction in the Rostov Region are identified and the feasibility of integrating PPPs into the state housing programs as a tool
for socio-economic sustainable development of the region based on the territorial integrated development.

The novelty of this work is to propose the creation of a coordination center for PPP development at the regional level, which will provide consulting, legal and organizational support for the projects for the entire period of their implementation and monitor their results.

The theoretical significance of this article lies in the algorithm development for the selection of PPP projects for the energy-efficient housing construction and their financing organization, which allows, based on the PPP projects socio-environmental and economic assessment indicators’ system calculation, to form a program and approve the scheme for their financing.

The practical significance of the proposed set of organizational, economic and legal frameworks in terms of taking into account the specifics of the PPP development and application in housing construction will help to smooth out the existing shortcomings in the investment strategy of the constituent entities in the Russian Federation and increase the interests’ consistency of the state, private investors and the population, which will positively affect the general concept of PPP development in the country.

References
[1] Anfimova M K 2016 Perfection of the financial mechanism of public-private partnership (The dissertation for the degree of candidate of economic sciences, Moscow).
[2] Yastrebov O A 2011 Organizational and economic mechanism for the implementation of investment and construction projects on the basis of public-private partnerships (Abstract of dissertation for the degree of Doctor of Economics, St. Petersburg).
[3] Averkieva E S 2017 Public-private partnership as an institution for stimulating entrepreneurial activity Economic regulation issues 8(1).
[4] Buzulutsky M I 2017 Public-private partnership as a mechanism to increase the availability of affordable and comfortable housing in the Russian Federation Business. Education. Right Bulletin of the Volgograd Institute of Business 2 (39).
[5] Olatalo O A, Makartsova T N, Tsvirenko S V 2017 Trends in the economic development of the construction industry: world experience and Russian innovations KANT 4(25).
[6] Murzin A D, Shvydenko N V, Filippova A V 2017 Analysis of the foreign and Russian experience in environmental construction Modern scientific knowledge, ideas and concepts A collection of scientific papers based on the materials of the 1st International Scientific and Practical Forum of Young Scientists, May 10, 2017, Yekaterinburg: NGO Professional Science.
[7] The study “Development of public-private partnerships in Russia in 2015-2016. Rating of Regions by Level of PPP Development ” 2016 Association“ PPP Development Center ”, Ministry of Economic Development of the Russian Federation (Association “PPP Development Center”,Moscow).
[8] Rating of regions of the Russian Federation in terms of PPP development. Information on https://rosinfra.ru/digest/rating
[9] Investment portal of the Rostov region. Information on http://investdon.com/ru/Monitoring_PPP/
[10] Ivanova N N, Shvydenko N V 2012 Formation of a management system for the construction of youth housing complexes Monograph (Rostov state university of civil engineering, Rostov-on-Don).
[11] Shvydenko N V, Osadchaya N A, Murzin A D, Murzina S M 2017 Socio-ecological and economic assessment of energy-efficient housing construction Humanitarian and socio-economic sciences 2 (93).
[12] Kosareva E N, Rogozhina N N, Ivankina, E V 2016 Public-private partnership in the housing sector (Prospect, Moscow).