

Energy service agreement as a tool of the program implementation aimed at raising of energy efficiency: challenges and opportunities

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Abstract. In this article relevance of energy service agreement as a tool of energy efficiency raising has been proved. On the basis of analysis of researches aimed at energy service agreements, legislative base and procedural framework, examples of implementation of energy service agreements the key challenges have been defined, slowing down the development of energy services market in Russia. Possible ways of solving these problems have been shown and the necessity of complex approach to dealing with these issues has been drawn.

Today relevance of the issue of energy efficiency improvement in the Russian economy is practically assured. Researches devoted to energy efficiency in Russia proved that energy output ratio of the Russian economy is higher than in the American one by 2–3 times and by 3,5–6 times higher than in West European and there is a stable trend in raising of energy output ratio [1].

Issues of energy saving and raising of energy output ratio got their urgency after the first Energy crisis in 1970. The richest experience in these issues belongs to such countries as Japan, the USA and the countries of the Eastern Europe. The usage of the energy saving agreement as a tool of energy efficiency raising is the standard of practice abroad.

In Russia the interest to the problem of energy efficiency raising has appeared not so long ago: the first legislation in the sphere of energy saving appeared at the end of 1990, but energy service hasn't been widely spread, in spite of apparent advantages of this type of interaction:

- Feasibility of using the competencies of experts in the sphere of energy efficiency raising.
- Advanced abilities of fund raising, connecting with the fact that in the process of implementation of performance agreement this issue is dealt by energy saving company as a rule.

Experts in the sphere of energy saving bind the slow growth of energy service market in Russia with the problems appeared in the process of implementation of energy service agreement. For better understanding of future development of energy service market it's

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necessary to consider the given below problems, find out the causes of these problems, figure out the possible ways of their solving.

1. Lack of state support

The analysis of the foreign experience in the sphere of energy efficiency raising proved that in the most developed countries initiating stakeholder is the state. These countries are Japan, the USA, Germany, Austria, Sweden and the other countries of Europe.

Apparently, that in the issue of energy service market development as a tool of energy efficiency raising the state participation is necessary. State support must be expressed in the form of information and legislative activity.

In the part of information activity, the experts from their personal experience noted, that in spite of state caring out large and expensive information campaign, aimed at explanation of statements of Federal Law 261, from 7 of 10 cases, it's necessary to explain to managers of different levels the aim and mechanism of energy service implementation from the very beginning [2], that characterizes the efficiency of information support.

As for the Russian legislation in the sphere of energy service the majority of researchers noted down, that its imperfection and the lack of clarity in many issues, in legislative and tax support of energy service agreements.

Apart from legislative and information support, active state participation in the development of energy service market by introducing the tax remissions, acting as a guarantee before financial institutions, direct investment with the help of mechanism of state-private partnership would allow to sort out the other problems, listed below.

2. Difficulties in fund raising

Market research of energy service in Russia proved, that the majority of implementing now projects in energy efficiency improvement are cost efficient, because the projects with short payback period are of priority.

Nevertheless, considering the process of energy efficiency improvement as transition to the new technological level, it's necessary to emphasize the projects provide modernization of equipment and technologies, it implies heavy expenses. This statement is particularly true for enterprises, where the large losses of power resources are connected with deterioration of equipment.

Connecting the abovementioned facts, nowadays in Russia the program aimed at fund raising of activities on energy efficiency improvement in the frame of energy service agreements is urgent.

The key problem is that the major part of energy service companies are average and small companies which do not have sufficient their own capital base, that's the reason why this type of financing is not used. It ought to be remarked that while attracting the leveraged financing some difficulties appear such as considering this type of business as very risky by financial institutions, that's why interest rates for such loans are high enough. Moreover, the experts consider the projects with interest rate more than 14% are money loosing [3, 4].

Coming back to the issue of lack of state support, it should be noted that state participation as one of the parties of energy service agreement, would allow to solve the problem of financing energy service agreements to some extent.

3. There are large risks for energy service companies not to get payment

Energy service agreement for energy service companies is defined like investment, consequently, besides some specific risks energy service companies take some conventional risks, which are attributed to investment projects.

High risks with the given type of activity is one of the reasons for some difficulties' occurrence in fund raising, which have been mentioned above. Financial companies are not ready to accept the risks, connecting with not payback back the investment money in a full volume.

Insurance mechanism of energy service companies has been used as a tool of reduction the risks, appearing while implementation of measures in energy efficiency raising for a long time. Moreover, issue of insurance is one of the key points in foreign energy performance agreements, but while adapting energy service agreements to the conditions of Russia, this item was excluded from it. In such a way, the risks exist in energy saving projects abroad increase in many times because of non binding nature of contract relations and not so great experience of native energy service companies in this sphere [5].

4. Impossibility of defining the proper value of energy saving due to the difficulties appear with validity of datum line

Urgency of the issue of defining the base line of energy consumption is determined by the fact that the base line is the base of all the calculations made by the agreement, consequently the given problem enlarges the risk of non payment money back [2].

Within the framework of the researches, the analysis of performed in Russia projects has been made, which revealed some peculiarities of defining the base line of energy consumption [6]. They are:

1. Sensitivity analysis of projects showed that the slightest deviation of the value of base line can lead to shortage in economy up to the occurrence of situation when a project becomes money loosing. The example of such analysis is given in Table 1. The project of modernization of heating net-work of one heat power plant in Western Siberia has been chosen as an object.

Table 1. Sensitivity analysis of project by changing the effect (value of economy) caused by corresponding changing of base line.

Changing of base line, %	-10,7	-7,14	-3,57	0	+3,57	+7,14	+10,7
Changing of effect, %	-15	-10	-5	0	+5	+10	+15
NPV, th, RUR	-5 165	-1 539	2 077	5 575	9 072	12 596	16 06

2. Comparison of variables of project efficiency depending on the method of defining of the base line proved that the choice of methodology of its defining impacts greatly on the financial results of the project. The analysis of variables' comparison of the same project is given in Table 2.

Table 2. Comparison of variables of project efficiency depending on the method of defining the base line.

Variable	Method 1	Method 2
Net present value (NPV), mln. RUR	100,1	5,575
Internal rate return (IRR), %	51	17
Payback period, years	3,11	5, 21
Discounted payback period, years	3,62	7,24

Problem solving of defining of the base line can be development of universal methodology suitable for any type of objects, by the way considering branch and regional particularity of projects. The most prospective and full one at the present moment is the Standard «Measurement and verification of energy efficiency» issued by the Russian association of energy service companies [7]. The given standard was called by experts «revolution of the branch» [8] that gives hope that application of the standard will allow experts to solve some problems, appearing in the process of energy service agreement implementation.

5. Distribution of money value of extra economy of energy resources

Existing practice of energy service agreement implementation in Russia showed that one of the most urgent problems related to interaction between client and energy service company is the problem of distributing of money value of economy of fuel energy

resources (FER), which appears as a result of measures implementation aimed at energy efficiency raising.

The way of developing of contract price should be explained. While making an agreement two variables are given by energy service company: variable of energy resources saving (given in percentage of current consumption) and proportion of money economy, which must be paid to energy service company during the whole period of project implementation. Payment given to energy service company can be expressed by the formula (1):

$$P^{ESC} = \alpha^{ESC} * \Delta V^{FER} * T, \quad (1)$$

where P^{ESC} – payment, got by energy service company,

α^{ESC} – proportion of money economy, announced by energy service company,

ΔV^{FER} – saving of fuel energy resources FER in physical terms (as difference between basic and factual levels of consumption);

T – price per unit of FER (tariff).

In the process of energy service project implementation three variants of economy distribution can appear:

1. Energy service company does not reach the declared level of economy – energy service company doesn't get payment and pays the forfeit according to the terms of agreement.
2. Achieved level of economy corresponds to declared one – energy service company gets payment according to the terms of agreement.
3. Achieved level of economy exceeds the declared one.

Apparently, while distributing amount of extra economy, conflict of interests of client and energy service company appears:

– From the point of view of the client, energy service company declares necessary for it amount of payment, consequently the money value of economy, which exceeds the level declared by energy service company, must belong to the client.

– The opposite interest appears from energy service company: the client has only declared in the agreement level of economy, consequently, everything, which has been got extra – it's payment for energy service company.

In such a way, the distribution of amount of extra economy must be practically done by compromise. Apparently, the conditions of distribution of extra economy must be written in agreement in order to avoid conflicts between parties.

Nowadays no legislative and methodical guidelines exist, connecting with distribution of extra value of economy.

RF Government regulation No. 636 contains the condition about the percentage of extra economy, that this percent paid to energy service company can't exceed fixed percent of economy in the terms of money of corresponding expenses of client for getting energy resource, stipulated in the agreement [9]. By the way, the given regulation concerns only state and municipal institutions, moreover, the given condition is considered to be limiting but not sufficient for determination of conditions of distribution of extra economy, that's one more time underlines imperfection of legislative framework of energy service agreements.

Analyzing the mentioned above problems, it should be noted, that, they are interconnected with each other, and it's not excluded that, joint solving some of them will have synergy effect.

For example, the problem of fund raising is closely connected with large risks of energy service projects. Meanwhile, involving the state support will help to solve these problems as a complex. The problem of imperfection of legislative framework and normative base causes the described difficulties in defining base line and distributing of extra economy, which in its turn, enlarge the risks of energy service companies within the projects.

In such a way, it's apparent, that for development of the market of energy service in Russia, complex solution of the problems is necessary. Dealing with the problems the following directions can be figured out:

1. Improving of normative base connecting with concluding agreements with energy service companies.
2. Development and integration of methodical statements by the most difficult agreement processes: defining of base line, validity of measurements, distribution of extra economy and etc.
3. Stimulating of interest of financial and insurance organizations to implement new loan and insurance products.

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