

# Innovative approaches to finance energy efficiency projects in Russia

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## Abstract

Russia has an enormous potential for improvement of energy efficiency, most of which is located in the energy sector and in communal heating. Especially the potential in communal heating is still wasted mainly because of low tariffs for the residential sector, which do not cover long term marginal costs, and of high investment risks in Russian regions and towns. However, in 2002 the Russian government made some first steps in order to improve conditions for investment into this field. Adjusted schemes of performance contracting involving credits from the West might start working under certain conditions in order to increase energy efficiency on the supply side. The problem still remains how to secure the uncertainties and risks.

Practical experience with modernisation of small scale local heating systems, using old-fashioned boilers, in one Russian region gives an idea, how to overcome the still existing barriers. The presentation will explain innovative opportunities of risk assurance and institutional models of performance contracting, which were adjusted to the conditions in Russia for an individual case. It would be useful to reduplicate this experience and to implement these models in different Russian regions. However, it is a big challenge to reach that purpose in a society, where individual conditions and relationship still are prevailing. Private Western institutions and companies could play a crucial role in order to make those models work. How could they be interested in participating in such models? Would risk assurance by natu-

ral gas exports be a sophisticated solution? Could shared emission reduction certificates be an incentive? Some considerations in order to answer these questions will be presented.

## Introduction

Russia has an enormous potential for improvement of energy efficiency, most of which is located in the energy sector and communal heating. Especially the potential in communal heating is still wasted mainly because of low tariffs for the residential sector, which do not cover long term marginal costs, and of high investment risks in Russian regions and towns. Nevertheless, financing schemes could be developed which would help to overcome the existing barriers on the supply side. The paper will first briefly describe the existing barriers for an increase of energy efficiency in the Russian communal heating sector. Secondly, it will design a possible financing scheme and explain the existing rules for implementation of the scheme. Finally, it will analyse the incentives of potential partners in a pilot project for development and implementation of such a scheme.

## Barriers to energy efficiency in the Russian communal heating sector

During the last years energy efficiency goals have received more attention and higher priority in Russia's energy policy. Several attempts have been made by the Russian government to develop and to increase incentives for energy efficiency improvement. Most of these attempts have focussed on Federal and Regional energy efficiency programs. How-

ever, not much success compared to the potential has been achieved so far.

The main bulk of energy efficiency potential is within the Russian energy sector itself. According to the IEA, the energy sector accounts for an estimated 40% of the potential savings.<sup>1</sup> Investment into new capacities and modernisation in the power and gas sectors made by the half State owned companies RAO EES Rossii and Gazprom have had a positive effect on energy efficiency. However, the heating sector, which is mainly owned by the municipalities, lacks investment into efficiency improvement. As far as the heating sector itself does not have a homogeneous structure but consists of big CHP plants as well as of hundred of thousands smaller decentralised boilers, investment needs for concrete projects are often below the volumes international banks are interested in financing. In addition, on the demand side, metering systems for heat consumption of every final customer need to be installed and the accounting and billing system needs to be changed in order to allow residential customers to pay only for the in fact consumed heat.

This shows very clearly, that even if it is true that energy efficiency improvement needs investment, it is not the lack of private and public money per se which is hampering energy efficiency improvement. Instead, it is the insufficient framework for energy efficiency investment, which makes money flow into much more attractive investment fields. This is, of course, true both for Russian and foreign capital. As there is no limitation any longer for Russian banks and investors to select from the most attractive investment opportunities over the world, their behaviour in setting investment priorities will be much the same like that of foreign investors and banks. For efficiency projects the result is that they have to compete for investment with other projects, thus, a favourable investment framework for efficiency projects is a major prerequisite.

In contradiction to this requirement, the communal heating sector is characterised by special investment conditions, which are much worse compared to other energy sub sectors. The conditions include:

- Lack of enforcement of contracts concluded with communal authorities;
- Lack of enforcement of contracts with final customers for heat (possibilities to shut off non-payers are almost not existing);
- Lack of own investment means of the communal bodies;
- Lack of creditworthiness of communal bodies (low risk assurance);
- Small size of the projects;
- Limited scale for reaching cost covering tariffs in a short period of time; this, in fact, leads to longer payback periods;
- Limited rights of decision making; (Prices, relevant for the scheme of refinancing investment are set by independent regional regulatory bodies, local budgets are

made on a yearly basis and are often highly subsidised from federal or regional budgets, which makes them highly unpredictable.) This would make necessary to involve other bodies into the contract and lead to more complicated contract arrangements.

In addition, it has to be considered, that these are special conditions placed in an overall complicated investment framework in Russia.

As far as the prices for heat are concerned the present situation is very specific. On the one hand, regional energy commissions have the right to set heat prices which fully cover production and distribution costs according costs occurring on the internal Russian market. That means, cost rely on fuel prices of the internal market. On the other hand, tariffs for the final customers of the residential sector are set below such prices. The difference between the tariffs and the established prices is covered by the local budgets. Often these local budgets are additionally subsidised by the regional or federal budgets. In practice, these "planned" subsidies are not transferred at full amount, thus local budgets are in heavy deficits.

To a certain degree, efficiency investment often requires technology imports from the West and thus needs hard currency financing. In order to keep interest rates low, hard currency investment would not be expected to be provided by a Russian bank but rather by a Western bank. High currency risks and the overall country risk for credits in hard currency would lead to higher interest rates. This makes investment more expensive and payback periods longer. Fiscal and legal risks are high in general too.

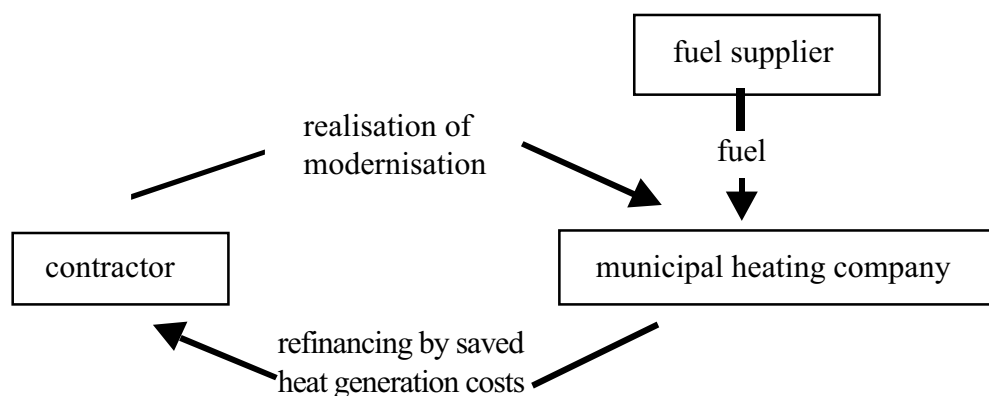
The Kyoto Protocol's flexible mechanisms, in principle, could give an additional opportunity to make investment into efficiency measures more attractive. However, until today no clear and transparent rules and responsibilities are established in Russia in order to assign and guarantee transfer of achieved reduced emission rights, let alone the baseline standardisation for small scale projects. This seems to raise the risks especially for small scaled projects. Transactions costs for using the Joint Implementation mechanism may increase substantially.

### **Adjusted performance contracting – an opportunity to overcome the barriers**

Adjusted schemes of performance contracting involving credits from the West might lower the barriers. Performance contracting, a variation of the ESCO<sup>2</sup> model, has been successfully implemented in many Western countries. Repayment of investment is financed from saved energy costs. The respective payback period is mainly determined by the amount of saved energy costs and the interest rate of credits used for pre-financing the investment. Different models are possible which include variations of sharing saved costs between the contractor and the client, which would on the one hand extend the payback period but would on the other hand transfer earlier benefits to the client. The contractor, the company which undertakes the efficiency investment,

1. IEA, 2002, Russia Energy Survey 2002, p.223.

2. Energy Service Company



**Figure 1:** Contracting scheme.

brings in the money and is responsible for implementing the necessary efficiency measures. (See Figure 1)

This arrangement would solve the barrier of low credit-worthiness of the Russian communal bodies and their lack of own capital.

#### **CURRENT RULES IN PLACE AND NECESSARY PRECONDITIONS FOR INTRODUCING MODELS OF PERFORMANCE CONTRACTING IN RUSSIA**

Although the overall framework for successfully implementing contracting schemes in Russia is still very weak, during the last years the Russian government has introduced some rules, which allow to make first steps into this direction. The Federal Government Decree No. 588 of June 1998, "On Additional Measures to Stimulate Energy Consumption in Russia" keeps energy-supply allocations constant for the payback period plus one year at federal facilities that implement efficiency projects.<sup>3</sup> In April 2002 an additional decree No. 226 on tariff setting for electricity and heat was adopted, which allows the whole cost difference for heat generation, which appears after an efficiency investment is made, to be used for refinancing the investment over the whole payback period.<sup>4</sup> Therefore one important precondition for contracting is already legally in force.

However, in the case of Russia, where the risk of non-payment, even by government and communal bodies and enterprises is high, it would be necessary to lower this risk too. Concerning such risks awareness is raising and there is an example of two Russian regions, which tried to minimise this risk by introducing regional laws and budgetary provisions. These acts provide official payment guarantees. Still there are no practical examples yet of concrete realised projects.

If an investment project would require hard currency credits, in addition, such communal guaranties would only be sufficient in the case the communal body is highly ranked by Western creditors. This could only be true for a very small number of cities like St. Petersburg, Nishni Nowgorod and some others.<sup>5</sup> State guarantees from the Russian Minis-

try of Finance would hardly be available for small scale projects.

An alternative for securing the non-repayment risk could be created by changing the structure of the contractor itself. The contractor could be set up in form of a Joint Venture between reliable Western and Russian partners. That means that the traditional performance contracting would be mixed with a type of production sharing agreement. Due to his regional know-how the Russian partner would secure the risks of non-transparency of Russian rules and legislation, then the risk of non-payment would also be much lower. The Western partner would bring into the Joint Venture his creditworthiness and knowledge of Western technologies.

#### **POSSIBLE SCHEMES OF REFINANCING INVESTMENT**

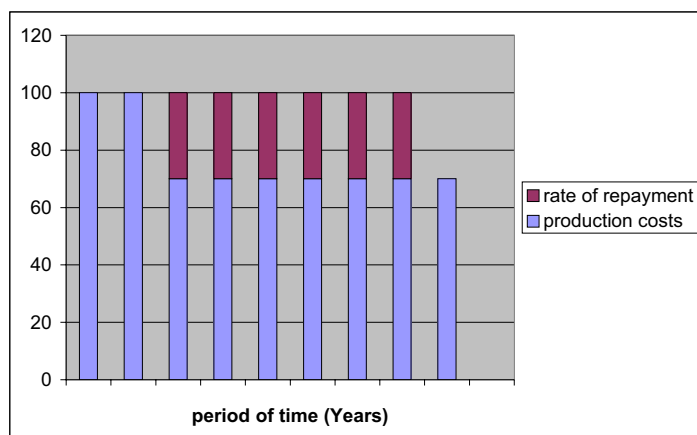
Two schemes of refinancing the investment from saved energy costs are considered to be applicable:

1. Repayment by the saved costs in Rubles (Figure 2). Due to low fuel costs on the internal Russian market the payback period could be quite long and in this case also the currency risk still persists, which makes the investment more expensive. For small scale projects, for example concerning the modernisation of decentralised boilers, payback periods of 5-6 years would be usual. This is due to the fact, that budgets have huge deficits and the real subsidies, which are really provided by the budgets, are not covering the whole costs. This means, that in practice not the full effect of cost reduction achieved by the investment is available for refinancing at the time reduction takes place. Tariff increases will not influence the payback period as long as the prices, which are established by the regional energy regulation commission, cover the costs. This is due to the fact that investment will be re-financed out of the income of the heating company which consists of tariffs paid by the final customers and the subsidies from the local budget. Only in the case if fuel prices on the internal Russian market will increase and heat prices will be adjusted to the increased costs, the payback

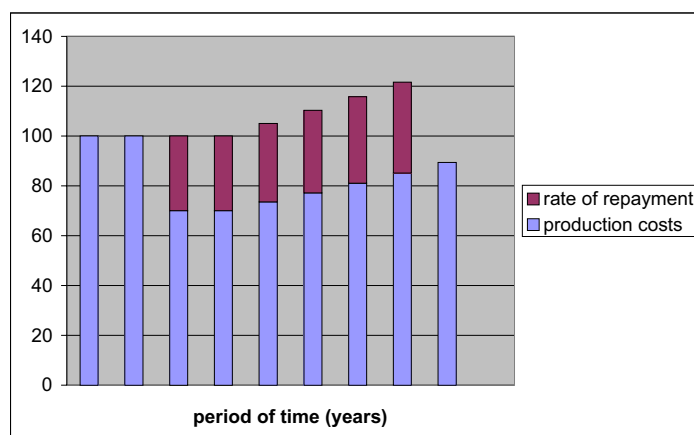
3. IEA, 2002, Russia Energy Survey 2002, p. 241.

4. Government of Russian Federation, 2002, Postanovleniye ot 2 aprelya 2002, No. 226.

5. Surgut and other oil or gas reach regions might also be accepted as guarantiers like the EBRD projects show.



**Figure 2:** Prepayment by saved costs in Rubles, constant heat prices (tariffs plus subsidies).



**Figure 3:** Repayment by saved costs in Rubles, increasing fuel and adjusted cost covering heat prices.

period could be reduced, depending on the rate of fuel prices/heat costs increases (Figure 3). Due to the general attempt to stepwise introduce market prices for fuel in Russia this would be a likely scenario.

2. Repayment by saved fuel. In case of the involvement of Western credits this would mean: By exporting the saved fuel at world market prices. This refinancing scheme would secure the currency risk and shorten the payback period substantially. The obstacle to overcome for this model is the export license for the payback period, which the contractor needs to obtain. In the case if fuel prices on the internal Russian market would increase very fast, a license for selling the saved fuel also on the internal market would be helpful during the pay-back period.

From the point of view of the Western creditor, the use of the second scheme, repayment by exported saved fuel,

seems to be the most attractive. Natural gas is well accepted as risk assurance. This is true also, if the market income from fuel exports would be shared between the fuel extracting company and the contractor. This might be necessary, if natural gas is used as a fuel for heating boilers, because in this case a decision is necessary on the Federal level. Export of natural gas is a monopoly of Gazexport<sup>6</sup> and either Gazprom or the Federal government should provide the contractor with an export license.

In the case of coal or oil, the scheme could be implemented if coal and oil supply companies are involved and the respective contracts would be signed. However, the current monopoly situation in natural gas export should be considered a major barrier for executing the second scheme and it would be helpful to make Gazprom interested in this kind of energy efficiency projects.

For the fuel extracting company, especially for Gazprom, incentives should arise from two aspects:

1. Additional unexpected income would be created. If no investment is undertaken in efficiency measures, the fuel would be sold at internal market prices and for Rubles to the heating company.
2. The amount of fuel available for exports will increase. When the investment into efficiency measures will be repaid and the export license for the contractor will be expired, the full amount of saved fuel remains with the extracting company. This should be of special interest for Gazprom. Energy efficiency increase in Russia would widen the opportunity for exports or secure fulfilment of export contracts and at the same time allow to prolong exploitation of Russian natural gas reserves.

On the other hand, transaction costs of this compensation scheme are high. This is especially true for small scale investment projects, where amounts of saved fuel are relatively small in relation to general export volumes of gas. Thus, the first scheme, based on repayment by saved costs might be more sufficient. Most important in this case is the reliability of the respective municipality, which ought to be the main partner of such a contract. As the contractor would not be willing to deal with the final customers on the one hand and with the subsidising municipality in parallel on the other hand because of high transaction costs, the municipality as the owner of the communal heating company should guarantee the fixed amount of saved costs to be paid out of the budget. In fact, saved costs are thus treated as the major part of the subsidies, which could be reduced after investment will be refinanced. In order to reduce the risks the local administration must make budgetary provisions for the period which is necessary to refinance the investment. We are aware that this does not fully exclude the political risk. However, the contractor remains owner of the equipment until it is fully refinanced.

The explained scheme, using part of the subsidies for refinancing investment could be applied only for efficiency measures on the supply side. In order to increase efficiency

6. Gazexport is a 100% daughter of Gazprom.

on the demand side, thus within the heat consumption private households, of course, cost covering tariffs are crucial.

### Interests of possible partners

In order to elaborate the proposed schemes and test their efficient functioning, a pilot project was started in one of the Russian regions. The goal of the pilot project is the modernisation of 245 decentralised gas fired heating boilers in 45 boiler houses, which would result in a reduction of used fuel by 30%.

The modernisation needs investment both in Rubles – for equipment produced in Russia – and in Western currency – for equipment, which needs to be imported. The communal heating company and the communal budget are not able to finance the investment out of their own financial resources. A credit is needed from a Western financial institute.

A joint Russian-German contracting firm is planned to be established. From the Russian side, the fuel supplier and the communal heating company are expected to participate. The Western partners are expected to be an experienced contracting company and an investor. The established contractor could then serve as reliable partner for the respective bank, which provides the necessary credit.

The interest of the Western partners is mainly the market entrance into a huge potential market for performance contracting in Russia. Replication only of one single contracting model, which was adjusted to the special case of modernisation of decentralised communal heating, is possible in many regions. There are about 100 000 decentralised small heating boiler houses in Russia, most of them need to be replaced. In addition, the model, once functioning, could be easily adjusted to other efficiency projects.

The communal heating companies are interested because of the opportunity to get modernisation financed. As far as the communal bodies are concerned, pressure on their budgets would be slowing down. In addition, a stepwise increase of fuel prices on the Russian internal market would be easier to handle (more political and social acceptance) because less fuel is needed after modernisation for the same volume of heat. Increased energy efficiency in heat generation would therefore also be of additional interest for the fuel supplier, because it would allow for a much more rapid adjustment of internal fuel prices to the world market level.

Replication of the model, of course, will be a challenging task. In an environment, where a stable institutional and legal framework is lacking and individual conditions and relationship still are prevailing, the selection of partners is crucial for success. However, emerging corporative structures as the associations of Russian towns and regions, branch associations of companies and associations of energy efficiency institutions like Energonadzor (responsible also for energy certifications) and Centres for energy efficiency are emerging and could play a crucial role for replication of best practice.

If incentives are so obvious, the question is, why those schemes are so difficult to implement? The answer seems to be similar to other innovations: the barriers of market entrance are high for the first player. Transaction costs are high for the testing phase and the risks are high because of lack-

ing experience. However, risk splitting between private capital and development banks, like EBRD, could reduce the barriers substantially. Thus, the role of public banks could be crucial to overcome the barriers of market entrance.