Risk Analysis of Energy Performance Contracting Projects in Russia

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Introduction

Energy Performance Contracting (EPC) projects carried out by Energy Service Companies (ESCOs) and other Energy Service Providing Companies (ESPCs) in the Russian market are considered key for the country's energy-efficient technical modernization. EPC projects are typically complex projects of an interdisciplinary character that bear technical and performance risks for ESCOs. These aim at refinancing their investments through a guaranteed amount of energy savings that results from the implemented energy conservation measures (ECMs) at the client's site. Depending on the form of the underlying contract, ESCOs may also be subject to investment and financial risks. In order to be able to guarantee the anticipated energy savings and, hence, to actually achieve the expected profits, ESCOs need to know the main EPC project risks and, provided some of the risks cannot be eliminated, to manage and mitigate these (Garbuzova-Schlifter and Madlener, 2014a; Garbuzova-Schlifter, 2015; Hansen, 2006; Mills et al., 2006; Wang and Chou, 2003). In Russia, however, most ESCOs and ESPCs lack expertise in the risk analysis and management in EPC projects, and most financiers rank EPC projects by default as "risky" investments. As a consequence, ESCOs and ESPCs suffer from limited access to funds at reasonable rates. Overall, in spite of promising expectations, the development of the high-potential market for energy services in Russia has been rather disappointing so far.

Aim and Scope of Study

To fill the existent research gap on this topic, we recently conducted a comprehensive study with the aim to identify, classify, and rank the main risk factors and causes of risk that ESCOs and ESPCs face under the vulnerable market conditions prevailing in Russia. The focus was put on three distinct sectors (hereafter "focus sectors"), in which most EPC projects up to now have been executed in the Russian market: (1) industrial; (2) housing and communal services, focusing on multi-family apartment buildings (MFABs); and (3) public.

Methodology

With reference to the international scientific, business and governmental literature, a list of general risks associated with planned or already realized EPC projects was produced. In a next step, the general risks identified were validated by Russian EPC practitioners in six semi-structured interviews conducted in Moscow in May 2013. This led to a comprehensive list of risks that Russian ESCOs and ESPCs may face when executing EPC projects in each of the focus sectors. The specific risks identified were then classified by us into risk factors and causes of risk, and ranked in terms of their contribution to the riskiness of an EPC project for each focus sector. The ranking was in line with the results of a web-based questionnaire survey conducted from February to April 2014 among experts employed by 162 ESCOs and ESPCs in Russia. This questionnaire consisted of two parts. The first part contained general questions about the participating companies. Between the first and the second part of the questionnaire, a filter question was inserted that allowed the respondents to select the focus sector where they believe to have the most expertise and experience with when assessing risk factors and causes of risk associated with EPC projects. After selecting the focus sector, the participants were directed to the second part of the questionnaire, which serves the multi-criteria decision making part of the survey that was based on the Analytic Hierarchy Process (AHP) method (Saaty, 1977; 2000).

Results

The response rate achieved in the questionnaire survey was 23.5%. The majority of the surveyed companies indicated that they do not employ a risk manager; however, 40% of these companies stated that they apply a formal approach for EPC project risk assessment. Fee-for services, fixed price, and shared savings were identified as the most applicable contractual forms for realizing EPC projects in Russia.

In accordance with the respondent's preferences elicited from the AHP-part of the questionnaire, the risk factors and causes of risk related to financial issues

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	Risk factors	Local priorities	Structural adjustment		Causes of risk	Local priorities	Global priorities	Rank
A	Risks of project preparation & execution phases	0.110	3/22	1	Project tendering exclusively price-based	0.291	0.035	16
				2	Lack of reliable data for baseline estimation of energy consumption of a client	0.194	0.023	21
				3	Unreliable energy certification provided by an external energy audit company	0.515	0.061	5
B	Contractual risks	0.114	2/22	1	No explicit risk pricing in EPC	0.536	0.044	10
				2	Poor prior risk division between an ESCO and a client	0.464	0.038	13
C	Technical & operational risks	0.084	3/22	1	Improper operation of the installed equipment by a client	0.292	0.027	19
				2	Improper verification of energy savings (approach/instruments)	0.482	0.044	11
				3	Energy supply disruptions	0.226	0.021	22
D	Financial risks	0.159	3/22	1	Poor investment capacity of an ESCO	0.271	0.047	8
				2	No long-term funding without a governmental or third-party guarantee for a loan	0.309	0.053	7
				3	Delayed energy saving payments from a client	0.420	0.072	3
E	Client's risks	0.109	3/22	1	Client's bankruptcy risk	0.210	0.025	20
				2	Fluctuation in client's energy consumption due to undisclosed changes in productive capacity	0.318	0.037	14
				3	Difficulty of an ESCO to prove energy savings have been achieved for a client	0.473	0.056	6
F	Human & behavioral risks	0.107	2/22	1	Lack of management & technical expertise	0.466	0.036	15
				2	Client's mistrust of an ESCO	0.534	0.041	12
G	Political & regulatory risks	0.165	3/22	1	Poor & unstable legislation base for EPC projects	0.390	0.069	4
				2	Lack of tax exemptions for EPC or an ESCO	0.419	0.074	2
				3	Cross subsidization	0.192	0.034	17
H	Market risks	0.151	3/22	1	Unpredictably fluctuating energy prices	0.202	0.033	18
				2	Poor market demand & lack of incentives to invest in energy efficiency	0.277	0.045	9
				3	High interest rates for bank or third-party lending	0.521	0.085	1

Source: Own compilation

Table 1: Ranking of risk factors and causes of risk associated with an EPC project executed in the Russian industrial sector

contribute most to the riskiness of EPC projects. Table 1 provides the ranking of risk factors and causes of risk that arise in EPC projects executed in the industrial sector as an example. More details on project risk ranking for the housing and communal services sector and the public sector can be found in Garbuzova-Schlifter and Madlener (2014b) For example, the *high interest rates for bank or third-party lending* was ranked highest among the potential causes of risk regarding EPC projects that are executed in the industrial sector, and second highest for projects executed in the housing and communal services sector. This result is not too surprising, since for most banks and other lenders, EPC is still a relatively new concept in Russia. Most lenders lack the technical expertise to evaluate and verify the return on investment of an EPC project that equals to the actual amount of energy savings achieved. Moreover, EPC projects are in most cases long-term projects executed under vulnerable market conditions. By contrast, for the EPC projects implemented in the public sector, where a governmental body may presumably serve as a guarantor, high interest rates do not seem to contribute much to the riskiness of EPC projects (this cause of risk was only ranked 12th). Nevertheless, according to our results, it seems that obtaining a governmental loan guarantee represents a difficulty for the majority of the Russian ESCOs or ESPCs engaged in the public sector.

Another important result from our study is that issues related to the regulatory aspects of the EPC projects executed in all three sectors were found to contribute significantly to the riskiness of such projects.

Conclusion

Risk analysis and management should be integrated into daily business activities of ESCOs and ESPCs that operate in the Russian market. This would allow systematic capturing of most of the risks and, hence, increase the transparency required by the third-party lenders in order to provide the necessary funds for EPC projects in all three focus sectors in the Russian market studied. The results from our survey study signal a strong need for improving the existing regulatory framework for EPC projects. Moreover, besides the improvements needed for the general regulatory framework of EPC, we conclude that for each focus sector an individual contracting scheme of a typical EPC should be elaborated. Such individual regulations for EPC projects would allow a better reflection of sectorial particularities during the EPC project conclusion and execution phases.

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