

Risk Analysis of Energy Management under Contracts

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Keywords: Energy management under contracts, Energy, Risk.

Abstract. Running an energy management projects under the contracts involves a number of legal regulations, policies, capital, market and technology. This paper analyzes the risk of energy management projects under the contracts in policy, marketing, operations, benefits and other aspects.

Introduction

Energy management under the contracts is a new mechanism based on energy-saving market, and its essence is that signing with willing customers who want energy-saving and providing comprehensive energy services, through the energy management under contracts. Then, sharing customers the efficient profit and development in energy project.

In this paper, the risk of energy management under contracts is the research object. recognizing and analyzing the risk in policy, market, operational and benefits under the present situation of economic development.

The Business Processes of Energy management under Contracts

Energy management under the contracts is One-stop comprehensive service of the energy company offering the energy efficiency audits, energy-saving project design, materials and equipment procurement, construction, training, operation and maintenance to clients. The investment of energy saving projects from energy service companies who bear most of the risk. In the contract period, energy service companies share energy-saving benefits generated by the project implementation with customers and recover their investment and get a reasonable profit. After the end of the project, energy-saving equipment belongs to customers.

The main business processes include:

(1)Energy Audit: Energy service companies investigate customers overall energy consumption in order to determine their level of energy consumption and analyse energy-saving potential.

(2)Energy-saving projects design: A proposal based on the analysis of energy-saving project can produce an overall rating for customer references in the aspects of energy-saving effect of the program, the level of investment, risk and benefit levels and provide the basis for the contract.

(3)Sign the energy management contract: the contract involves the specific content of the project, the ultimate goal of the project and the distribution of benefits the on both sides. The supporting contract documents include construction contracts, equipment procurement contracts, benefit-sharing contracts, service contracts, and energy-saving technology documents.

(4)The implementation of energy-saving projects: The energy service companies responsible for purchasing and installation while customers must provide the necessary facilities for the construction according to the contract.

(5)Training and Related Services: Using and maintaining the equipment must equip with professional staffs. The energy service companies have responsibilities for customer training and to provide related consulting services, also, responsible for maintaining the equipment, regular monitoring of energy savings in the contract period.

Risk Analysis of Energy Management Projects According to Contracts

Through the energy management business process analysis, the conclusion is that energy service companies make a plan and assessment, decision, takes the most risk of the project, moreover, the risk analysis in energy projects is the focus of energy service companies. The risks in the energy management projects include:

Tab.1 Risk Summary of Energy Management Projects under the Contracts

Policy risks	Macro-adjustment Policies And Regulations
	Imperfect Energy Efficiency Policies And Regulations
	Bank Interest Rates And Exchange Rate Fluctuations
Market Risk	Poor Information
	Technology Advancement
	Changes In The Cost Of Major Equipment
	Energy Price Changes
	Inflation
Operational risk	Cash Flow
	Human Resource Reserves
	Management Capabilities
	Subcontractor Quality, Work Quality And Integrity
	Operation And Maintenance
Benefits Risk	Preliminary Analysis, Diagnosis And Design Optimization
	Energy-saving Measurements And Expected Results For Energy Savings
	Customers Integrity Risk
	Customer Operations Risk

Policy Risks

Macro-adjustment Policies and Regulations: Due to the long term contract business in energy management projects, before handing-over, any uncertainty in policy cause a huge loss of the project. However, under the current financial management system, energy service companies and government do not analyze energy efficiency together, unless the central government or local finance make an appropriate decision that allowing government shares energy efficiency with those companies without increasing the energy cost or the energy-saving costs are included in the budget of government. As consequence, it will lead to a series of innovation of the national financial system.

Imperfect Energy Efficiency Policies and Regulations: At present, a legal stable and healthy policies environment to support contract energy management is lack and the imperfect regulations related to energy conservation are potential risks. While government have been promulgated the laws such as the " Energy Conservation Law In People's Republic of China and " Cleaner Production Promotion In Law People's Republic of China ", but do not to take coercive measures or with little coercive measures.

Bank Interest Rates and Exchange Rate Fluctuations: Interest rate risk refers to in the process of the project operation; the risk of fluctuations in interest rates caused a loss of project benefits. Currency fluctuations will affect the cost of production and operating costs of the project, if a weak currency, the price of imported materials will increase and have effect on the cost of the entire project. Moreover exchange rate changes will have an impact on the company's debt structure.

Market Risk

Poor Information: from the domestic market, the relevant government departments and companies have inadequate energy management propaganda and this model has not been

understood by most people yet. Due to poor information, using the contract energy management increases transaction costs and information gathering costs.

Technology Advancement: This risk caused by technical choices, technology buyers, advanced technology. In the contract energy management in buildings, due to using different building energy-saving technologies on different projects, the different energy-saving technology potential are not the same, the energy service companies have stand different levels of risk in the design of energy-saving programs.

Changes in The Cost of Major Equipment: At present, the most of the energy-saving equipment in China are imported; this may lead to increasing cost of production. Due to the market tightening in upstream customers.

Energy Price Changes: The factors such as energy policy adjustment, industrial restructuring and other policy, result in major changes in the structure of the customer energy-consumption.

Inflation: Inflation may cause local wage levels rose sharply, led directly rise in contract energy management projects operating costs and have a significant impact on the financial viability of the project.

Operational risk

Cash flow: It is one of the main risks in energy management project finance. It determines the operation of the project whether can generate sufficient cash flow according to schedule.

Human resource reserves: Energy service companies offer a range of energy-saving design, construction and management, involving the expertise and project management personnel and have more diversification than other industries. It is necessary to ensure stable and efficient management personnel during operation since the contract energy management projects always perform a long time.

Management capability: The ability relates to many aspects such as the construction organization ability, coordination, control, planning. The general performance of the energy services company's management capacity is lack of qualified personnel and cannot perform the contract successfully.

Subcontractor Quality, Work Quality and Integrity: As the reasons of management capacity, financial and others, energy service companies need most of the construction Subcontractor and their quality, the integrity of the energy-saving projects is critical for a successful implementation.

Operation and Maintenance: The technical and the quality of construction project are important guarantee to run energy conservation projects smoothly. While in recent years, from the results of China's energy management project, maintaining the energy saving projects and long-term customers Cooperation are also have large impacts after run the project.

Benefits Risk

Preliminary Analysis, Diagnosis and Design Optimization: In the early analysis and prediction of energy conservation project, the factors such as no exact investment projects, scale ignored, construction difficulties led to the project cannot be successful.

Energy-savings measurements and energy-savings expected results can be achieved or not: The main risks are to achieve the expected savings and energy service companies can get profit from the project. Energy service companies could not calculate in detail, the results is that the actual implementation of the project is lower than expected and the energy service companies cannot recover their investments and profits.

Customers Integrity Risk: Some companies have low integrity and break the contracts, even deliberately do not pay sharing-profit. As a result, this affects the healthy development and cooperation.

Customer Operations Risk: During the implementation of projects, the profitability will decline due to poor management. If there are no other effective measures, the adverse consequence is that the production scale will reduce and energy efficiency decreases because energy-saving equipment cannot reach a predetermined load.

Conclusion

Business process of contract energy management determines the risk of energy service companies in the implementation of energy management under contracts. The thesis recognizes and analyses each type of risks and Summary Tab 1.

Risk summary table of contract energy management as the important conclusion of this paper, is not only the result obtained from the risk identification, but also the basis for further analysis of energy management project under contracts risk avoidance for risk prevention, risk management.

Acknowledgement

Fund Project: University Graduate Innovation Fund In West China (Project Number: ycjj2015065)
Tel: 18084817787.

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