

# ENERGY PERFORMANCE CONTRACT (EPC) IN MALAYSIA AND OTHER COUNTRIES

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Minister of Energy, Green Technology, Science, Climate Change and Environment Minister Yeo Bee Yin mentioned that there are a few approaches taken by the government to promote energy efficiency such as 50 government buildings will be retrofitted with energy efficient lightings and appliances by next year through Energy Performance Contract (EPC), drafting the Energy Efficiency and Conservation Act, reviewing to improve the National Energy Efficiency Action Plan 2016-2025 and etc.

Energy Performance Contract (EPC) is a mechanism that uses market-based capital and technology to improve energy efficiency in buildings, industry, and other areas. There is a large room for development in the Energy Performance Contract market in Malaysia. This article analyses the key elements of market development in Malaysia, including market advantages and challenges.

Norazrin mentioned that the implementation of Energy Performance Contract (EPC) concept in Malaysia's government sector was approved by the government in January 2013. The concept of the EPC is based on a profit-sharing agreement between the building owner and the Energy Service Company (ESCO) whereby the initial cost for the energy efficiency improvement project is borne by the ESCO. In ensuring the successful implementation of the EPC, ESCOs are required to register with the Ministry of Finance (MoF) to carry out EPC projects in government buildings under the Green Technology Service Code (222801). Meanwhile, the Ministry of Finance (MoF) requires ESCOs applying for registration under this code to be registered with the Energy Commission. Since then, Malaysia's energy-saving service industry has developed rapidly, both in terms of the number of energy service companies (ESCOs) and the amount of investment in energy performance contract management.

The development of Malaysia's energy-saving service industry was concentrated in the industrial sector, mainly because industry is the main area of energy consumption, accounting for two-thirds of the country's total energy consumption. There is more than one model for Energy Performance Contract in Malaysia, with energy-saving benefit sharing as the main factor, partly because energy-saving benefit-sharing contracts can enjoy national financial incentives and tax incentives. The energy service industry is in its infancy, because Malaysia is in the market stage of rapid economic development and low energy prices. Many industrial enterprises, often only regard energy efficiency improvement as one of the means to reduce costs, and the impact on enterprises to expand production and increase profits. So, there is a lack of enthusiasm and initiative for energy efficiency investment. Under this circumstance, energy-saving service companies have promoted the implementation of Energy Performance Contract projects on a large scale by using their own funds for energy-saving retrofit and sharing energy-saving benefits with industrial enterprises, but at the same time, they have brought huge financial pressure to energy service companies.

For most small and medium-sized energy service companies in Malaysia, it is difficult to obtain third-party financing because of the lack of credit records, so most Energy management projects can only be financed with their limited liquidity, which results in a small project size. The Energy Performance Contract projects in the construction sector are small in number and small in technology, and the contractual energy management projects of public institutions are few and far between. The reason is that the property rights and use rights of commercial buildings and complex property management models make it difficult for energy-saving service companies to carry out Energy Performance Contract projects in the commercial field especially in public buildings. Even if the government has explicitly encouraged the public sector to adopt Energy Performance Contract to carry out energy-saving approaches, the government's fiscal budget system has

become an obstacle to the promotion of contract energy management. The current budget is to pay the energy cost only. It cannot pay the energy-saving benefits of energy service companies (ESCOs) implementing Energy Performance Contract projects.

In the initial stage of the development of Malaysia's energy-saving service industry, the energy-saving benefit-sharing business model has played an important role in the rapid start of the industry. However, as more and more “low-cost energy-saving measures” are implemented and the liquidity of energy-saving service companies are occupied with projects, the benefit-sharing model with energy service companies (ESCOs) as the main body of financing may be sustainable for the Energy Performance Contract market. This is also a potential opportunity to actively look for other financing models and contractual mechanisms. This requires new policies to support innovation in business models and financing mechanisms, as well as extending the Energy Performance Contract (EPC) to areas that are not currently covered. Malaysia's future energy-saving service market will continue to expand.

Therefore, it is a need to set targets for building energy efficiency retrofits, and the interest in building energy efficiency and green building has gradually increased, driving more buildings to obtain “green” certification, thereby increasing energy efficiency. The online monitoring system for energy consumption in the industrial and construction sectors will also help to understand energy use, tap energy-saving potential, and help energy-using units to benchmark energy efficiency and identify opportunities for energy savings. National and local governments encourage the adoption of Energy Performance Contract mechanisms in the public sector, which will further expand Malaysia's energy service market. The rising price of energy markets, the establishment of energy total control targets, and the establishment of carbon and other polluting emissions trading markets will all stimulate more energy-saving transformation market demand in Malaysia.

Energy saving detection and verification is also a challenge because each participant in the project has a strong economic interest in the project, especially to determine whether the energy savings generated by the project are from the implementation of energy-saving measures, or other factors. In the end, the energy service company (ESCO) introduced a new Energy Performance Contract model, namely energy-saving guarantee. In this model, ESCO guarantees the lowest energy savings, so that the minimum expected return on the project is deterministic and therefore more conducive to external financing. Energy Service company's balance sheet no longer has an investment in energy efficiency projects, which allows energy service companies to launch more new projects. At the same time, the International Performance Measurement and Verification Protocol (IPMVP) [4] stated that the long-term success of energy management projects is often hampered by the inability of the project partners to agree on an accurate, successful M&V plan. M&V protocol discusses procedures that, when implemented, help buyers, sellers and financiers of energy projects to agree on an M&V plan and quantify savings from energy conservation measure (ECM) projects which allows the project to provide clear evidence for assessing and recording project energy savings even if certain conditions change after startup. This procedure has given customers more confidence in energy savings and increased investor confidence in risk aversion.

Malaysia has huge potential for energy-saving initiatives. Government policies and incentives can consider encouraging contractual models that can help with technology consolidation and deeper transformation, and can include energy-saving guaranteed contractual models that help achieve greater reductions in greenhouse gas emissions. Malaysia can consider developing policies to encourage Energy Performance Contract projects to expand from the industrial sector to the construction sector. Many countries, including the United States, already have many successful cases of Energy Performance Contract in the construction sector. Malaysia can consider raising targets and strengthening incentives to promote deeper energy efficiency retrofits while driving large-scale, market-based financing.

There are a few approaches to further expanding energy saving future in Malaysia such as:

- Consider extending tax incentives, fiscal incentives, and measurement and verification practices to models other than benefit-sharing, including energy-saving models.

- Encourage interactions between companies, clients, and government decision makers to maximize the impact and the impact of incentives and subsidies.
- Expand the coverage of measurement and verification specifications to cover a wider range of project types. Through effective means, the measurement and verification specifications can meet the actual requirements of various types of contracts.
- Develop reliable tools to measure energy savings and establish effective baselines to facilitate deep energy savings.
- Increase the financing of the third-party financial investment institutions to the owners, develop the national public credit rating system and the required standards and guidelines allow an independent auditing firm to determine the accuracy of the financial report.
- Establish diverse and innovative financing channels to encourage greater energy savings; establish project bundling mechanisms to reduce transaction costs and scale.
- Continue to encourage financial innovation to open the civilian and commercial construction market and expand low-cost project integration.
- Establish an Energy Performance Contract model in the public sector: Adjust the government procurement policy and energy cost budget system according to the needs of Energy Performance Contract to drive the public Energy efficiency investment in the department.
- Allow the public sector to retain its original energy budget throughout the implementation of the project to reimburse energy-saving project contracts.
- Ensure that the procurement policy is beneficial to Energy Performance Contract projects, for example, explicitly allowing Energy Performance Contract models and allowing two-stage bidding (i.e. allowing energy service companies to conduct investment-level audits).
- Encourage to adopt procurement policies that are beneficial to Energy Performance Contract projects. Due to the high initial transaction costs in small-scale markets, it is encouraged to conduct consultations with energy-saving service companies to facilitate these small-scale markets to attract contractual energy management projects.
- Work with the Energy Performance Contract Demonstration Project Working Group to establish direction, especially to determine whether project selection is focused on the construction sector (public buildings, commercial buildings, etc.) or the industrial sector.
- Use the working group to advance the cooperation, consensus between the two parties, including the establishment of feasible contracts, financing, measurement and verification, and strategic issues such as important policy recommendations.

It is recommended that demonstration projects include technology integration solutions to achieve deep energy savings. At the same time, the following methods are adopted, including: energy-saving and quantity-guaranteed applications, more effective support for measurement and verification of technology integration, and third-party financing models.

In another case, the energy-saving customers did not trust the technology at first, so the two parties negotiated the energy performance contract model, and the energy-saving company assumed the risk of technology risks and capital investment. However, after the project was in operation for a period of time and the energy-saving benefits gradually appeared, the company found that the cost of signing the energy-saving contract was twice that of the buyout equipment, so they regretted it when they paid. Such examples are all in the energy-saving management industry. Later, on the basis of energy-saving benefit sharing, a variety of business models were derived from the industry.

In addition, financial difficulties are also a major obstacle in front of this industry. At the beginning of the project operation, the energy-saving company needs to provide a package of services such as start-up funds, equipment, installation and commissioning, maintenance and repair, etc., and recover the proceeds later. Therefore, the initial start-up capital is critical to the business. However, energy-saving enterprises are mostly in the initial stage, with potential risks and lack of guarantees, making it difficult to obtain bank loans. Under the circumstance, the contract energy management is still in its infancy in Malaysia. Smaller companies in various places are quite scattered, "each is in power", and there is no company that has occupied enough market share. From this point of view, the domestic energy-saving industry may experience some reshuffle in the future standardization process.

Finally, let's take a look at the situation in other countries of the world:

(1) US contract energy management policy

The US government has enacted the Federal Government Performance Contract (ESPC) Act, and the US Department of Energy has also provided specific guidance and assistance to government agencies to develop documents on contract energy management. After the implementation of the ESPC Act, the project capital recovery rate of the energy-saving benefit sharing model was accelerated, which reduced the financial risk of the energy-saving service company. After the contract was over, the federal government received all the energy-saving benefits and the economic growth rate was very fast. In addition, the US government has formulated a number of energy conservation policies, provided a good policy environment, promoted the development of the energy conservation service industry, and raised public awareness of energy conservation services. In addition to mandatory regulations, the United States has also developed a market-based approach to energy-saving standards in various industries to promote the development of energy-saving services, and has established standards for the verification and testing of energy-saving services in the energy-saving service industry on a technical level in order to standardize energy-saving services market.

(2) Canada's contract energy management policy.

The federal and local governments of Canada attach great importance to contract energy management and have established a specialized energy-saving service company. The six largest banks in Canada support contract energy management, and the bank evaluates the customer's contract energy management program and gives priority to funding. In 1992, the Canadian government began implementing the Federal Buildings Initiative (FBI), which detailed the methodological guidelines and implementation procedures for government agencies to implement contract energy management projects, providing training, preparation guidelines, and contract samples. Review the qualifications of energy service companies, review contracts, propose changes, and recognize the accelerated depreciation of equipment. The federal government adopts three types of contracting methods: ensuring energy savings, sharing energy savings, and a combination of the two. Government departments at all levels signed contracts with energy conservation service companies to reduce energy consumption of the government with energy management contracts.

(3) Czech contract energy management policy.

In the early 1990s, the Czech Republic began to focus on the development of the contract energy management industry. With the help of the Czech Energy Conservation Center (SEVEN), the US-funded energy efficiency service (EPS) first entered the Czech market, and then some Czech energy-saving service companies started. Energy service companies in other countries have also entered quickly. In the past 20 years, Czech contract energy management has been operating better. During the period, the Czech Republic has enacted laws to encourage the development of the contract energy management industry, and proposed a series of public incentives, such as: the Ministry of Energy provides energy-saving investment for energy service companies. Subsidies, energy prices are also subsidized in some cases; most ESCO project funds are mainly from bank loans, the bank's annual interest rate is 10%-20%. This is lower than other transition countries.

(4) France's contract energy management policy.

Since the 1970s, the French government has been committed to promoting energy conservation. The French Environmental Energy Control Agency is the country's national agency that controls environmental pollution. The current funding for energy conservation and environmental protection comes mainly from government grants and corporate environmental pollution charges (or environmental management fees). 71% of the funds used are energy-saving projects implemented in industrial enterprises through contract energy management.

(5) Japan's contract energy management policy.

The Japanese government adopted mandatory means to promote the development of contract energy management. In 2002, the Japanese government revised the Energy Conservation Law to ensure the smooth development of energy conservation work, which mandatory implementation

of energy efficiency indicators for all large energy-intensive industrial enterprises and commercial buildings. Provisions and requirements for regular submission of energy consumption reports have opened up markets for the business development of energy service companies. At the same time, the government supports the energy-saving service company to attract private enterprises and government departments by providing low-interest loans, and supports and assists in the implementation of new energy and energy-saving projects through the New Energy and Work Technology Development Agency (NEDO).

There are still rooms of improvement in handling energy efficiency future in Malaysia. It is always believed that there are many factors that can contribute to energy efficiency. By taking the quote from Neil Armstrong on 20 July 1969 to suit the energy saving future in Malaysia, 'one small step, one giant leap' for Malaysia energy efficient future.

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