



Energy service companies

Key points

- **Companies specialized in energy-efficiency projects reduce the costs of and accelerate the transition to a low-carbon economy.**
- **Because ESCOs are fairly new businesses outside of the United States and Europe, their assimilation into developing countries demands government support.**

Energy service companies explained

Definitions for what constitutes an energy service company, or ESCO, vary from country to country. Broadly defined, an ESCO is a business that develops, implements and finances energy-saving projects. The National Association of Energy Service Companies in the United States defines an ESCO as “a company that provides energy efficiency-related and other value-added services and for which performance contracting is a core part of its energy efficiency services business.”¹

How it works

History of ESCOs

The ESCO industry emerged in the United States as a result of the oil crisis, which led to exorbitant energy prices in the 1970s.² After that, the ESCO concept disseminated to most industrialized countries. Developing countries, however, took more time to adopt the business model. In the 1990s, the first ESCOs were created in developing countries, first in the Republic of Korea in 1992, then in China in 1995, followed by Thailand in 2000 and Nepal in 2002.³ The first Asian ESCO conference took place in Thailand in October 2005.⁴

Business model

Typically, ESCO services are offered through performance-based contracting. An ESCO acts as a project developer. The costs of a project are covered by the generated energy savings. In other words, an ESCO's revenue is directly linked to the actual energy savings from the project it conducts. Within this model, an ESCO bears the responsibility for performance and technical risks of its projects and thereby has a direct interest in assuring that all projects indeed save the amount of energy guaranteed. Services offered by ESCOs include comprehensive energy savings projects, installation and maintenance of energy-efficient equipment and the measurement and verification of energy savings.⁵

¹ ICF International and National Association of Energy Services Companies, *Introduction to Energy Performance Contracting* (Fairfax, 2007). Available from www.energystar.gov/ia/partners/spp_res/Introduction_to_Performance_Contracting.pdf (accessed 7 February 2012).

² Diana Üрге-Vorsatz and others, *An Assessment of on Energy Service Companies (ESCOs) Worldwide* (Budapest, 2007).

³ *ibid.*

⁴ Mark Stoughton and Anbumozhi Venkatachalam, *Green Services and Emergence and Recovery from the Global Economics Slowdown in Developing Asian Economies* (Tokyo, 2010). Available from www.adbi.org/files/2010.03.31.wp209.green.services.emergence.recovery.gfc.asia.pdf (accessed 24 January 2012).

⁵ National Association of Energy Service Companies, *What is an ESCO?* (Washington, D.C., 2011). Available from www.naesco.org/resources/esco.htm (accessed 25 January 2012).

Box 1: Examples of ESCO business models

The list ranges from the full-service or high-risk contracts to low-service or low-risk contracts:

Full-service ESCO: The ESCO designs, finances and implements a project, verifies energy savings and shares an agreed percentage of the economic value of the actual energy savings over a fixed period of time with a customer.

End-use outsourcing: The ESCO takes over the operation and maintenance of the equipment and sells the output (steam, heating, cooling or lighting) to a customer at an agreed price. Costs for all equipment upgrades, repairs, etc. are borne by the ESCO, but ownership typically remains with the customer.

ESCO with third-party financing: The ESCO designs and implements the project but does not finance it, although it may arrange for or facilitate financing. The ESCO guarantees that the energy savings will be sufficient to cover debt service payments.

ESCO variable terms contract: This is similar to the full-service ESCO, except that the contract terms can vary depending on actual savings. If actual savings are less than expected, the contract can be extended to allow the ESCO to recover its agreed payment.

Equipment supplier credit: The equipment supplier designs and commissions the project, verifying that the energy savings match expectations. Payment can be made on a lump-sum basis either after commissioning or over time (typically part of the estimated energy savings). Ownership of the equipment is transferred to the customer immediately.

Equipment leasing: Similar to equipment supplier credit, the supplier receives fixed payments from the estimated energy savings. In this case, however, the supplier owns the equipment until all the lease payments and any transfer payments are completed.

Technical consultant (with performance-based payments): The ESCO conducts an audit and assists with project implementation. The ESCO and the customer agree on a performance-based fee, which can include penalties for lacking energy savings and bonuses for higher savings.

Technical consultant (with fixed payments): The ESCO conducts an audit, designs the project and either assists a customer in implementing a project or simply advises the customer for a fixed, lump-sum fee.

Source: World Bank, *World Bank GEF Energy Efficiency Portfolio Review and Practitioner's Handbook* (Washington, D.C., 2004).

Market size and trends of ESCO industries in Asia

Energy-efficiency projects help conserve natural resources, reduce dependence on fossil fuel for electricity generation, increase energy securities and improve industrial and commercial competitiveness through cost reduction and increased productivity. The potential for improving energy efficiency is present in all residential, commercial, industrial, agricultural and municipal corners of an economy. Because the ESCO is a relatively new concept outside of the United States and Europe, there is much room for market expansion in Asia and the Pacific. For example, ICF International, a consultancy firm, estimated the investment potential in energy efficiency in India at around US\$10 billion.⁶

⁶ Amit Khare, New Delhi, 14-15 January 2010. presented at the Asia ESCO Conference, January 2010. Available from www.asiaesco.org/pdf/presentation/1-1.pdf (accessed 25 January 2012).

Country experience: Energy conservation target and energy-saving service sector in China

China has targeted cutting its energy consumption and CO₂ emissions per unit of GDP by 16 per cent by 2015. To achieve this goal, the country is building a system to benchmark energy-efficiency performance in each sector of the economy. Additionally, it plans to help enterprises realize the energy-efficiency target by developing an energy-saving service sector, which focuses its operations on the transportation and constructing building sectors. During the five-year plan period, the domestic energy-saving service sector is supposed to create a market value of 300–500 billion yuan and more than 1,000 companies.⁷

Sources: *Mechanical Engineering Magazine*, "Energy Conservation Gets Local in China", September 2011. Available from http://memagazine.asme.org/Articles/2011/September/Global_Window.cfm (accessed on 7 February 2012); and Deborah Seligsohn and Angel Hsu, "How Does China's 12th Five-Year Plan Address Energy and the Environment?", *World Resources Institute News*, March 7, 2011. Available from www.wri.org/stories/2011/03/how-does-chinas-12th-five-year-plan-address-energy-and-environment (accessed 13 March 2012).

Strengths of energy service companies

- **Help businesses improve energy performance:** Due to the high capital cost, long payback time and lack of technical capabilities in project implementation, measuring and verifying, companies are reluctant to invest in energy saving projects. The ESCO industry offers a way to fill the time and price gaps of capital-intensive energy-efficiency projects. ESCOs can serve institutional, industrial or residential clients who want to improve their energy performance.

Especially regarding the costs arising from an energy-efficiency project that are often seen as a burden, the ESCO can provide businesses with a reasonable and marketable option to transform this perceived burden into a cost-saving opportunity by designing projects that can be financed through the energy costs they save.

- **ESCOs assume the risk:** The ESCO risk policy appeals to clients; the ESCO often works under a performance guarantee, which shifts the risk from the client to the ESCO. If the energy savings lag behind the quantity that has been promised, the ESCO receives adjusted and decreased revenue. The flexibility of many ESCO contracts and measures is a favourable asset. The ESCO can implement additional measures to meet the agreed energy savings goal in time, or the contract period can be prolonged.
- **Variety of options:** There is a large variety of ESCO companies, ranging from full-service ESCOs and equipment suppliers to technical consultants. With this array of options, every business can find the ESCO solution that is best suited for its management strategy and company features.

Challenges for energy service companies

Some major barriers to the development of an ESCO industry include:

- Lack of information and understanding of the benefits of energy efficiency
- Lack of understanding of energy-performance contracting
- Lack of project financing, the low price of electricity
- Burdensome administrative procedures to measure and verify energy savings
- Lack of government support.

⁷ *Mechanical Engineering Magazine*, "Energy Conservation Gets Local in China", September 2011. Available from http://memagazine.asme.org/Articles/2011/September/Global_Window.cfm (accessed on 7 February 2012).

Table 1: Policy challenges to developing an ESCO industry

Barrier	Elements of barrier
Lack of governmental policy and leadership on energy efficiency and ESCO industry	No policy or leadership on energy efficiency or demand-side management, or on ESCO industry; no energy codes and standards; energy audits are not mandatory, nor subsidized.
Low cost of electricity and other energy carriers (gas and district heating)	Subsidized energy costs; externalities not included; results in long payback periods; energy prices equal average costs rather than long-run marginal costs.
Lack of budgeting and standardized public procurement rules, contracts, procedures and guidelines for ESCO services	Especially for state-owned properties and the municipal sector.
Large economic and political uncertainty	Little attention paid to energy efficiency.
Conflicts with other government policies	Little attention paid to energy efficiency.
Unfavorable tax regimes	Existing tax and fiscal system discourage energy efficiency.
No existing legal framework for protecting the interests of EPC participants	EPC unknown in country.

Source: Edward Vine, "An international survey of the energy service company (ESCO) industry", *Energy Policy* (2005), vol. 33, pp. 691-704.

Implementing strategies

Actions for promoting the ESCO industry

There are several types of strategic actions that have been used internationally to promote the development of the ESCO industry. A few examples are:^{8,9}

- **Creating awareness and increasing information about the energy-efficiency projects, financing opportunities and services that ESCOs offer.** This can be achieved by using government facilities for demonstration projects for energy savings to build confidence among other consumers.
- **Providing incentives for financial institutions to invest in ESCOs.** In some cases, financial institutions may require guarantees in order to invest in energy-efficiency financing. Governments can create a "guarantee fund" to address this concern in the early stage of the market development. The fund can be phased out once the financing market for ESCOs matures.
- **Providing funding sources for ESCOs to develop their businesses.** For example, governments can set up an energy-efficiency fund to finance energy-efficiency projects or provide loans to small and medium-sized ESCOs through co-financing.¹⁰
- **Promoting energy-performance contracting at all government levels.**
- **Developing standardized contracts to help end users, ESCOs and investors to better understand performance contracting.** In the same breath, standards for measuring and verifying energy savings need to be developed to ensure the quality of the ESCO services. Governments can set up an ESCO association to take up this role and to standardize and streamline the process. More specific actions include setting up a database of model contracts and procedures that can be accessed by all ESCOs. Collaboration with international ESCOs and associations can also be useful for sharing information and lessons learned.

⁸ Bill Huei-Jiunn Chen and Bing-Chwen Yang, "Activities of ESCO in Taiwan", presented at the Asia ESCO Conference, January 2010. Available from www.asiaesco.org/pdf/presentation/3-6.pdf (accessed 29 January 2012).

⁹ Hidetoshi Nakagami, "Recent Activity of the ESCO Industry in Japan & Asian Countries", presented at the Asia ESCO Conference, January 2010. Available from www.asiaesco.org/pdf/presentation/3-1.pdf (accessed 29 January 2012).

¹⁰ J. P. Painuly, H. Park, M. K. Lee and J. Noh, "Promoting energy efficiency financing and ESCOs in developing countries: mechanisms and barriers", *Journal of Cleaner Production* (2003), vol. 11, No. 6, pp. 659-665.

Further reading

An Assessment of Energy Service Companies (ESCOs) Worldwide, by D. Ürge-Vorsatz and others (Budapest, 2007). Available from http://89.206.150.89/documents/esco_synthesis.pdf

Green Services and Emergence and Recovery from the Global Economics Slowdown in Developing Asian Economies, by M. Stoughton and A. Venkatachalam (Tokyo, 2010). Available from www.adbi.org/files/2010.03.31.wp209.green.services.emergence.recovery.gfc.asia.pdf