THE GLOBAL ESCO NETWORK

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2025

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The *Global ESCO Market 2025 Report* was made possible thanks to the generous contributions, insights, and support of numerous individuals and organizations across more than 25 countries. We are especially grateful to the national partners who provided data and insights through the survey, including ESCO associations and energy experts from China, India, Indonesia, Japan, Malaysia, the Philippines, South Korea, Taiwan (PRC), Thailand, Belgium, the Czech Republic, Germany, Hungary, Poland, Slovakia, Spain, the Netherlands, Türkiye, the United Kingdom, Mali, South Africa, the United Arab Emirates, Uganda, Mexico, and the United States of America.

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We would like to express our sincere gratitude to all the ESCO associations, energy service companies, policy experts, and government representatives who participated in the survey and shared their valuable perspectives. We are also thankful to the International Energy Agency (IEA) for their close collaboration in developing and administering the global survey.

We extend special appreciation to the many individuals who contributed to the process, including: Aida Pandeh, Agustín Villar, Alexander Ablaza, Allan Musinguzi, Ameera Yasin, Bagui Diarra, Bérengère Lanneau, Carlos Ballesteros Barrado, Carmen Pavel, Christophe Leroy, Claudio G. Ferrari, Daniele Forni, Denis Tanguay, Dhevan Pillay, Dilip Limaye, Elvis Ssekate, Esben Mortensen, Hugo Magalhaes Madureira, Hung-Yao Chao, Ir. Ong Ching Loon, Isaac Ephraim Tumusiime, Jackie Duarte, Jaroslav Marousek, Javier Galván Villamarin, Jingwen Wang, Jorge Rodrigues de Almeida, Jayanta Chaudhuri, Judianto Hasan, Jung Eun Lee, Kassarin Thirakomen, Kavita Gandhi, Kiril Raytchev, Kristóf Fekete, László Bihari, Lawrence Mangerere, Lieven Vanstraelen, Luís Ricardo Trezza, Luke Menzel, Mami Veza, Mark Lister, Miroslav Marada, Mine Isik, Mónica Gazmuri Del Curto, Nick Keegan, Nicholas Howarth, Oleksii Korchmit, Onur Günduru, Onur Ünlü, Peerasut Thirakomen, Pierre Langlois, Pranee Dangtim, Rachid Hamida, Radim Kohoutek, Rafał Cieślak, Raul G. Ortega, Raymond Marquez, Ricardo Vélasquez, Rüdiger Lohse, Satish Kumar, Serkan Emin, Silva Inostroza Roxana, Simone Alessandri, Stephan Juen, Svetlana Adamek, Tetsuya Maekawa, Timothy Unruh, Tomáš Kubečka, Valérie Plainemaison, Vittorio Cossarini, Warantri Sumitpaiboon, Washington Alexandre, Yasemin Somuncu, Zulkifli Zahari, and Yoon Seok Jae.

List of Acronyms

BEE	Bureau of Energy Efficiency (India)
BMF	Business Models and Finance
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
EPC	Energy Performance Contract
ESCO	Energy Service Company
EU	European Union
GWh	Gigawatt-hours
HVAC	Heating, Ventilation, and Air Conditioning
IEA	International Energy Agency
IEC	Integrated Energy Contract
IPMVP	International Performance Measurement and Verification Protocol
kWh	Kilowatt-hours
LED	Light Emitting Diode
M&V	Measurement and Verification
MSME	Micro, Small and Medium Enterprise
NA	Not Available / Not Applicable
PFI	Participating Financial Institution
PLR	Prime Lending Rate
PPP	Public-Private Partnership
PRSF	Partial Risk Sharing Facility
SEforALL	Sustainable Energy for All
SIDBI	Small Industries Development Bank of India
UNEP	United Nations Environment Programme
UNEP-CCC	UNEP Copenhagen Climate Centre
USD	United States Dollar
VSD / VFD	Variable Speed Drive / Variable Frequency Drive

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Søren Lütken

1. Executive Summary

The Global ESCO Market 2025 Report provides a comprehensive overview of the status, challenges, and opportunities in the energy service company (ESCO) sector across more than 25 countries. It captures developments not only in the largest and most mature markets, but also in emerging economies where ESCO models are beginning to gain traction. The report synthesizes key trends, market developments, and policy landscapes shaping the industry in areas such as activity levels, financing, policy, and technology.

ESCOs play a critical role in delivering energy efficiency solutions that support national climate and energy goals. Through models like Energy Performance Contracting (EPC), they offer a practical and scalable approach to financing and implementing sustainable energy improvements across sectors including buildings, industry, and public infrastructure - often with performance guarantees and innovative financing mechanisms.

Global Landscape

The report finds that ESCO markets remain highly uneven in terms of maturity, scale, and innovation. The majority of ESCO activity - measured in number of projects, investments, and reported energy savings - is concentrated in a handful of countries, including the United States, China, Taiwan (PRC), and several EU member states. These countries have well-established regulatory frameworks, access to finance, and capacity for implementation. In contrast, many developing and emerging markets report minimal ESCO activity, due largely to weak policy support, limited financial mechanisms, and lack of technical awareness.

Key Findings

The analysis was conducted as a 24-point questionnaire distributed to ESCO associations and other national representatives with insights into the national ESCO markets. The central findings from responses received are:

- **Access to finance** remains the most commonly cited barrier to ESCO market growth, followed by low client awareness and lack of standardization in contracts and M&V protocols.
- **Public buildings** are the most frequent target of ESCO projects globally, while sectors like commercial buildings, industry, and energy supply remain underutilized.
- **Project types and savings levels** vary widely. Integrated, system-level retrofits tend to generate the highest energy savings but require greater investment and institutional support.
- **Policy frameworks** are essential for enabling ESCO markets. Countries with strong mandates, incentives, and technical assistance programs have seen significantly more progress.

Strategic Implications

The report recommends a targeted scaling of ESCO models to emerging markets, greater policy coherence, and enhanced financing tools, including risk-sharing mechanisms and blended finance. It also highlights the need to broaden ESCO engagement into underserved sectors and technologies, such as industrial systems, demand flexibility, and supply-side energy efficiency.

It further underscores the importance of capacity building, standardization, and aggregated project pipelines to lower transaction costs and improve bankability.

By accelerating the development of the ESCO sector, governments and stakeholders can unlock critical gains in energy savings, emissions reductions, and economic resilience - key pillars of the global climate neutrality transition.

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2. Introduction & Rationale

Background

The global climate crisis necessitates urgent action to reduce greenhouse gas emissions, yet there remains a significant gap between current emission reduction trajectories and the targets set under the Paris Agreement. Energy efficiency is a key strategy for closing this emissions gap, as it represents one of the most cost-effective ways to lower energy consumption and associated carbon emissions. The International Energy Agency (IEA) has highlighted the urgent need to accelerate global energy efficiency improvements. Current efficiency gains are insufficient to meet global decarbonization goals. According to the IEA, the rate of energy efficiency improvement needs to at least double to align with net-zero pathways. This requires not only stronger policy support but also greater mobilization of private capital to fund large-scale energy efficiency projects.

Given the scale of investment required to meet energy efficiency targets, public sector intervention and public financing alone is insufficient. In many markets, ESCOs play a vital role in bridging this finance gap by offering performance-based contracting models that allow clients to implement efficiency improvements without upfront capital expenditures. By leveraging innovative financing mechanisms, such as energy performance contracts (EPCs) and public-private partnerships, ESCOs enable businesses, industries, and public institutions to reduce energy costs while achieving sustainability goals.

However, a substantial financing gap continues to limit the large-scale deployment of energy efficiency solutions. While EPCs reduce the need for clients to invest upfront, they do not eliminate the financing challenge - rather, they shift liquidity requirements from the client to the ESCOs. Consequently, EPCs are not financing solutions themselves, especially in markets where access to capital is constrained. This issue is even more pronounced in emerging economies, where the ESCO model is still developing and financing options remain limited despite growing interest in energy efficiency investments.

Why This Report is Needed

Despite the recognized importance of ESCOs in advancing energy efficiency, comprehensive, up-to-date market data remains limited. Many existing reports focus on broad energy efficiency trends but lack a detailed analysis of the importance of ESCOs across different markets. This report fills that gap by providing a granular, data-driven assessment of national and global ESCO markets.

Reliable data is essential for shaping effective policies and investment strategies. This report provides key insights into ESCO market barriers and enablers, with the potential to assist policymakers design regulatory frameworks that foster market expansion. Additionally, it equips investors and industry stakeholders with the intelligence to identify opportunities, assess risks, and allocate resources effectively.

By compiling survey responses from ESCO market participants worldwide, this report presents quantitative and qualitative insights into investment flows, project typologies, financing models, and policy landscapes. The comparative analysis across 25 markets enables a deeper understanding of regional and national differences, uncovering best practices and common challenges in ESCO development.

By leveraging the latest data from the IEA & Global ESCO Network Joint Survey, this report delivers a data-driven assessment that can help identify opportunities for scaling up ESCO activities and provide actionable recommendations to enhance market growth and investment flows.

Data Aggregation and Comparative Analysis Approach

The survey follows a structured data collection and aggregation process, ensuring national-level insights while maintaining confidentiality for sensitive information. Responses are gathered from industry experts, ESCO associations, and governmental agencies, providing a robust dataset that reflects real market conditions.

To identify regional disparities, common challenges, and emerging opportunities, the survey employs a comparative analysis framework across 25 markets. All collected data is examined in relation to global trends, enabling a nuanced understanding of how ESCO markets are evolving in different economic and regulatory contexts. Specific elements of the comparative analysis include:

- Evaluation of ESCO market development stages across different regions.
- Analysis of financing mechanisms, project structures, and capital flows.
- Assessment of how government policies influence ESCO market expansion.
- Identification of common challenges, such as financing constraints, policy uncertainties, and technical capacity gaps.

Data Coverage

The survey currently includes data from 25 countries, representing diverse market conditions across different regions. The participating countries are:

- Asia-Pacific: China, India[1], Indonesia, Japan, Malaysia, Philippines, South Korea, Taiwan (PRC), Thailand.
- Europe & Central Asia: Belgium, Czech Republic, Germany, Hungary, Poland, Slovakia, Spain, The Netherlands, Türkiye, United Kingdom (UK).
- Middle East & Africa: Mali, South Africa, United Arab Emirates (UAE), Uganda.
- North & Central America: Mexico, United States.

Annex A provides details of the organization or association that responded to the survey for each of the countries.

Disclaimer

This report presents findings based solely on the responses collected through the survey. The data and insights reflect the perspectives of survey participants and do not represent an exhaustive assessment of the sector. While every effort has been made to ensure accuracy, the results are dependent on the information provided by respondents and may not fully capture all trends, developments, or regional variations.

It should also be noted that, in some cases, responses were submitted by representatives - such as ESCO associations - on behalf of multiple members. As a result, the actual number of entities represented may be significantly higher than the number of individual survey entries. While this enhances the representativeness of the data, it also means that comparisons across parameters should be interpreted with caution, as the statistical significance of such comparisons may be limited.

From this perspective, the report should be interpreted as an indicative analysis, offering general insights into prevailing trends rather than precise quantitative conclusions.

1 India did not complete the survey but data from AEEE was provided based on their ESCO survey.

3. Global ESCO Market Overview: 2025 Insights

3.1 Market Size & Growth Trends

Overall, the findings underscore significant disparities in ESCO market development worldwide, highlighting both opportunities for expansion in emerging markets and the potential for stronger policy intervention to drive investment in energy efficiency solutions. Some countries, such as Taiwan (PRC), report significant activity and can provide quantifiable data. In contrast, others - most notably China and the United States, which remain the two largest ESCO markets - are not able to fully quantify their markets in terms of the number of new EPCs or total investment size.

Other mature markets like the United Kingdom follow with an estimate of 700 active projects, positioning itself as a key player in Europe, while Germany and South Africa each report 500 projects, indicating well-developed ESCO markets with steady investment in energy efficiency solutions.

There is a larger group of mid-sized markets such as Malaysia, with 206 active projects, and Thailand and Belgium, each with 100 projects, show moderate adoption, signaling growth potential but still trailing behind the leading markets. The Philippines, Slovakia, South Korea, and Türkiye report between 40 and 70 active projects, indicating smaller but potentially expanding ESCO sectors. Czech Republic and Spain, with approximately 60 and 54 active ESCO projects respectively, is in a similar mid-tier category.

Relatively low ESCO activity is recorded in Poland with 30. In Southeast Asia, Thailand, Malaysia, and the Philippines show promising mid-level ESCO activity, reflecting growing demand but still falling short compared to leading markets.

The data also suggests that developing markets might face barriers to ESCO growth, particularly in countries like the UAE, Mali, Mexico, and Indonesia, where minimal or no ESCO projects exist. These challenges could stem from financial constraints, regulatory hurdles, or a lack of awareness about energy performance contracting. However, the data reveals a significant disparity in ESCO project adoption worldwide.

The USA launched 1,877 new projects last year, followed by Taiwan (PRC) which reported 875 projects. China, despite being one of the largest ESCO markets globally, did not report the number of new projects.

Table 1. Trends in National ESCO markets

	No. of Projects	No. of New Projects	Market size USD
México	2	0	250000
Poland	30	1	85 million
Taiwan (PRC)	2460	875	430 million
Japan		123	NA
UK	700	100	700 million
South Korea	48	25	288 million
South Africa	>500		NA
China			70000 million
Indonesia	2	3	175000
Belgium	100	10	300 million
Hungary			NA
Philippines	71	17	111 million
Germany	500	10	7000 million
Slovakia	50	10	NA
Mali	0	0	NA
USA		1877	
Czech Republic	22	17	80 million
Türkiye	43	52	47 million
Thailand	100	85	187.5 million
Malaysia	206		

Market Growth

Decline | Moderate decline | No change | Moderate growth | Strong growth | I don't know

In terms of total investment in new ESCO projects over the past year, the global figure reached approximately USD 15.7 billion. This estimate is based only on reporting countries and does not represent the full global market. The United States clearly leads, with a total investment of USD 10.66 billion - accounting for around 68 percent of the reported global total. This dominance reflects the maturity of the U.S. ESCO market, supported by well-established financial mechanisms, and a strong institutional framework that enables large-scale, long-term energy performance contracting.

China ranks second with an investment of USD 2.29 billion, or approximately 15 percent of the total. Combined, the United States and China represent more than 83 percent of global ESCO investments, highlighting the high concentration of market activity in just two markets.

European countries collectively reported 471 new ESCO projects, although this likely underrepresents actual activity in the region. Of these, the United Kingdom estimated approximately 100 projects and Spain 323. In terms of investment, Spain led the region with USD 964.7 million allocated to new projects in the past year.

This places Spain ahead of Germany, which reported USD 675 million on average, and the United Kingdom, which estimated USD 300 million. Spain's strong performance likely reflects the combined effect of EU directives, national support schemes, relatively high energy prices compared to many other EU countries, and increased awareness among both public and private sector actors about the value of energy efficiency services.

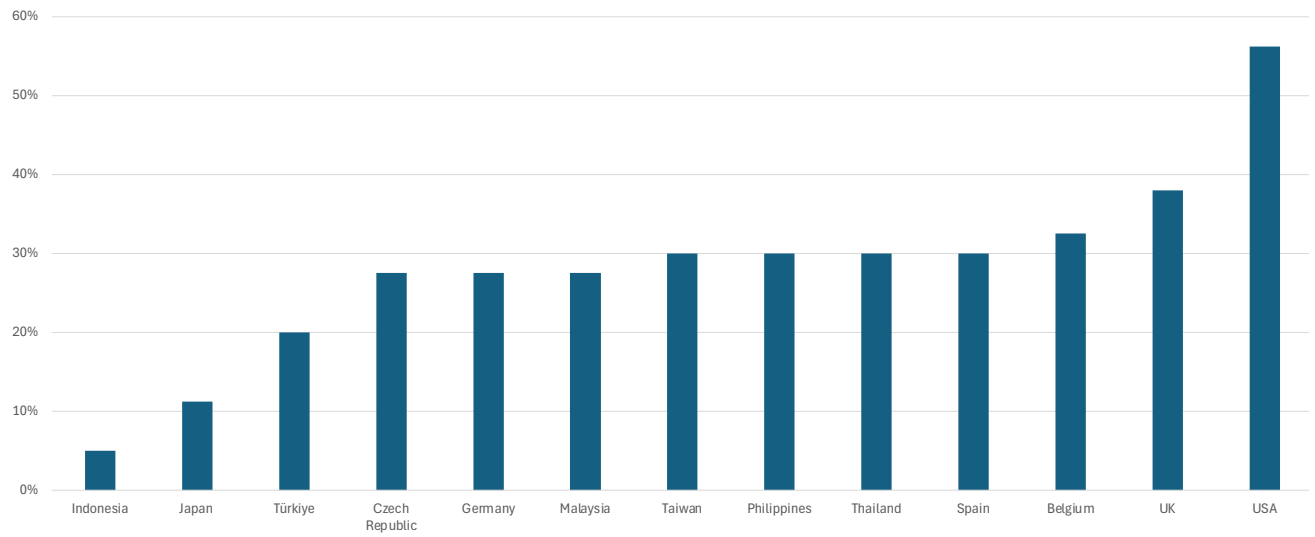
Europe holds significant growth potential for further ESCO market growth. A stronger expansion could be expected if governments introduce the regulatory and financial enablers that are adopted in recent EU Directives on buildings and energy efficiency to drive market development and adoption.

Countries in the Asia-Pacific region, including Japan, Thailand, South Korea and Philippines saw a higher number of new ESCO projects compared to some individual European countries. Japan alone recorded 123 new ESCO projects in 2023, while Southeast Asian countries. Collectively, southeast Asian countries launched 105 new projects, signaling a growing ESCO market in the region.

However, total investment levels were relatively smaller compared to Europe. Japan reported USD 340 million while Thailand, Taiwan (PRC), and South Korea reported numbers between USD 116 million to USD 160 million. These figures indicate a rising interest in ESCO models across the region, though projects tend to be smaller in scale and still trail behind the leading global markets in terms of investment.

Overall, the data reveals a highly uneven global distribution of ESCO investment, with the United States and China driving the majority of activity. Spain's position as the leading European investor marks a notable shift within the region, demonstrating that with the right enabling conditions, countries can significantly scale up their ESCO markets. However, many developing and emerging economies continue to face substantial barriers, underscoring the need for stronger policy frameworks, targeted awareness campaigns, and innovative financial instruments to unlock their energy efficiency potential.

Figure 1. Energy savings as percentage of baseline consumption (new ESCO projects)



Energy Savings Achieved in ESCO Projects

The data on energy savings percentages compared to baselines for new ESCO projects as seen in Figure 1 shows the relative efficiency gains achieved through energy performance contracting in different national contexts. At the lower end of the scale, Indonesia, while reporting some investment, shows a modest average savings rate of 5%, suggesting either early-stage projects, limited scopes, or challenges in achieving higher performance outcomes. Mid-tier performers include Japan (11.2%) and Türkiye (20%), reflecting growing yet still maturing ESCO sectors. These values indicate some progress in energy efficiency but leave substantial room for improvement in the depth of savings per project. A cluster of countries report identical savings rates of around 30% (Czech Republic, Germany, Malaysia, Taiwan, Philippines, Thailand, Spain and Belgium). This grouping indicates relatively mature ESCO activity and consistency in implementation modalities and technical performance. The United Kingdom, with 38%, stand out among European countries as achieving higher average savings, likely tied to policy frameworks and incentive structures that promote deeper retrofits or comprehensive energy measures.

The United States is the clear leader, reporting an average savings rate of 56.2%, almost double the European average and significantly above all other countries. This impressive figure reflects scale and complexity of U.S. ESCO projects, many of which focus on integrated, multi-measure energy solutions in large institutional or public-sector settings, but it may also indicate a relatively energy-intensive starting point.

Overall, the table highlights a wide disparity in ESCO project outcomes globally. While many countries are achieving savings in the 25-35% range, only a few, like the U.S. and UK, are pushing toward deeper energy reductions. Spain's position at 30% suggests a solid performance in line with other mid- to high-performing countries, even as the market continues to develop.

The results also underscore the importance of consistent methodologies in calculating and reporting energy savings. Given the variety of project types and local conditions, further analysis would be useful to understand the specific drivers behind these percentages and the role of policy, financing models, and project design in shaping ESCO impact.

3.2 Market Dynamics: Growth vs. Decline

From a global perspective, the ESCO market continues to show positive growth, although survey responses reveal mixed trend in the total value of new contracts across different markets. The United States remains the largest and most mature market, reporting sustained growth. Several other countries - despite being at very different stages of market development - also indicate strong expansion. For example, Mali reports rapid growth from a near-zero baseline, while the Czech Republic, Türkiye, and Thailand show notable increases in activity. These trends reflect rising demand and growing investment in energy efficiency services across markets with varying levels of maturity.

Most markets, including South Africa, China, Indonesia, Belgium, Hungary, the Philippines, Germany, and Slovakia, report moderate growth, which overall leads to a positive assessment of ESCO prospects, not only driven by the market leaders, but reflecting a global trend towards increasing acceptance of the ESCO model.

In Mali, the observed ESCO market growth is largely driven by pilot project funding from the World Bank. However, this growth is not yet supported by sustained incentives or strong government engagement.

Only Mexico, Poland, and Taiwan (PRC) report declines, with Mexico experiencing a strong decline and Poland and Taiwan (PRC) seeing moderate declines. Japan, South Korea and the UK indicate no change, suggesting a stable but potentially stagnant market environment. In Mexico, the most likely explanation is policy deterioration, while further insights are necessary for other markets.

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4. ESCO Market Segmentation & Project Typologies

4.1 Types of ESCO Projects

The data reveals distinct implementation approaches across countries. In some markets - such as the Czech Republic, Indonesia, Belgium, and Poland - ESCOs are almost exclusively carrying out integrated system renovations, while in others, single-technology replacements remain the primary strategy. This is particularly evident in South Korea and Taiwan (PRC), and to a lesser extent in Mexico, Japan, and the Philippines, where single-technology approaches dominate.

There are no immediately obvious explanations for these differences, and the absence of data from the two largest ESCO markets - China and the United States - limits the scope of interpretation. Nevertheless, given that integrated approaches are widely regarded as one of the key added values of ESCO engagement in energy retrofits, and that the average reported savings from such projects are consistently higher than in countries where single-technology solutions prevail, further insights may still be drawn from the available responses.

Notably, four markets - Poland, the United Kingdom, Belgium, and the Czech Republic - report both a strong emphasis on multi-technology retrofits and a clear focus on public buildings. Indonesia, while a less mature market, also reports a strong multi-technology approach, though exclusively within the industrial sector. Conversely, countries such as South Korea and Japan implement almost all ESCO projects in industry, while the Philippines and Malaysia report a strong preference for single-technology solutions, primarily in commercial buildings and industrial facilities.

These trends suggest a possible pattern: multi-technology retrofits are most often deployed in public buildings, while single-technology solutions are more commonly found in industrial and commercial settings.

Advancing toward comprehensive system renovations is essential for maximizing energy savings and achieving long-term decarbonization goals. Therefore, it is critical to identify and address the barriers that limit the broader adoption of integrated retrofit approaches in industry.

Table 2. Energy Efficiency Projects by Single-Technology Replacements vs. Integrated System Renovations

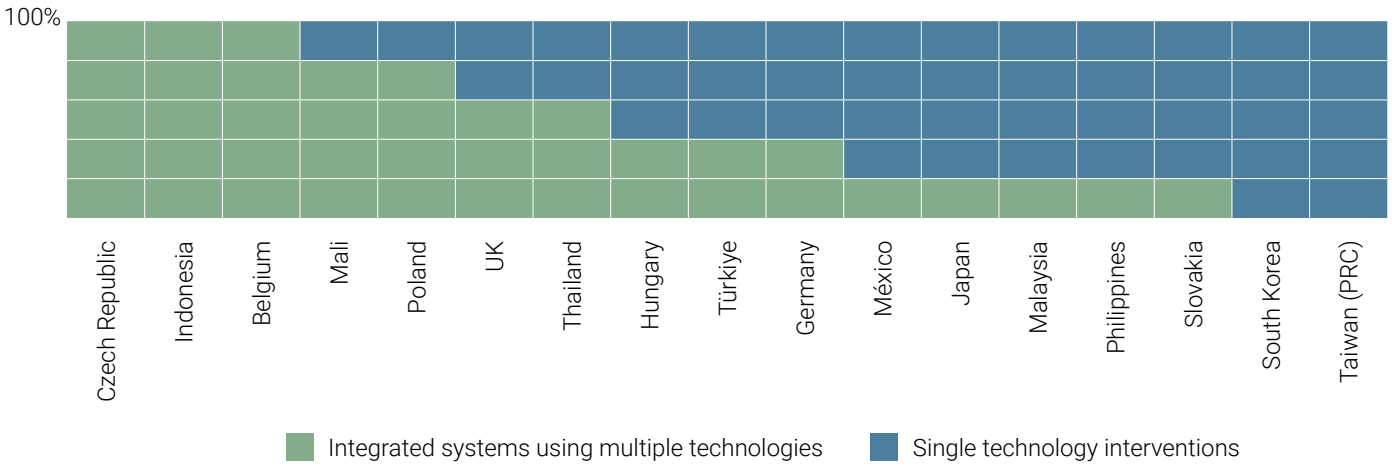


Table 3. Distribution of Active ESCO Projects by Sub-Sector

	Public buildings	Com-mercial buildings	Residential buildings	District Energy heating/ cooling	Industry	Trans-port	Public light-ing (street and traffic)	Demand flexibility & energy storage	Energy supply
Poland	61-80%		0-20%	0-20%			0-20%		0-20%
South Africa	0-20%	21-40%	0-20%	0-20%	61-80%	21-40%	41-60%	21-40%	41-60%
Taiwan	21-40%	21-40%	0-20%	0-20%	21-40%	0-20%	0-20%	0-20%	0-20%
China	21-40%	0-20%	0-20%	21-40%	41-60%	0-20%	0-20%	0-20%	0-20%
Malaysia	0-20%	21-40%	0-20%	0-20%	21-40%	0-20%	0-20%	0-20%	0-20%
USA	81-100%	0-20%					0-20%	0-20%	21-40%
Indonesia					81-100%				
Belgium	61-80%	0-20%	0-20%	0-20%	0-20%	0-20%	0-20%	0-20%	21-40%
Japan	0-20%	21-40%	0-20%	0-20%		0-20%	0-20%	0-20%	0-20%
UAE	21-40%	0-20%	0-20%	0-20%			0-20%	0-20%	
Mali	61-80% 81-100%		0-20%		0-20%				
UK	61-80%	21-40%	0-20%	21-40%	0-20%	0-20%	0-20%	0-20%	0-20%
South Korea	0-20%				81-100%		0-20%		
Uganda	0-20%	61-80%	0-20%	0-20%	61-80%	0-20%	21-40%	0-20%	0-20%
Hungary	0-20%	21-40%	0-20%	0-20%	21-40%	21-40%	21-40%	0-20%	0-20%
Philippines	0-20%	61-80%		0-20%	0-20%				
Czech Republic	81-100%	0-20%	0-20%	0-20%	0-20%	0-20%	21-40%	0-20%	0-20%
Germany	0-20%	21-40%	0-20%	21-40%	21-40%	0-20%	0-20%	0-20%	41-60%
Slovakia	41-60%	21-40%							
The Netherlands	81-100%								
México									41-60%
Türkiye	0-20%	0-20%	0-20%		41-60%	0-20%	0-20%	0-20%	0-20%
Thailand	0-20%	21-40%		21-40%	21-40%	21-40%	0-20%	0-20%	0-20%

0-20% 21-40% 41-60% 61-80% 81-100%

Sub-Sector Distribution of ESCO Projects

The data provides a detailed breakdown of the sub-sectors where active ESCO projects are being implemented, revealing both communalities and differences in energy efficiency investments across different countries.

Public buildings emerge as the most dominant sector for ESCO projects, particularly in the United States, Czech Republic, and the Netherlands, where 81-100% of projects are concentrated in this segment. Similarly, Poland, Belgium, and the UK also report a high share (61-80%) of projects in public buildings. This strong presence suggests that government-led energy efficiency initiatives and public procurement policies are conducive to ESCO adoption in these markets. Public lighting - encompassing street lighting and traffic lights - represents another key area of intervention for ESCOs in the public sector. However, compared to energy efficiency projects in buildings, ESCO activity in public lighting remains moderate. Only a few countries, including South Africa, Slovakia, Uganda, and the Czech Republic, report that 21-60% of their ESCO efforts are dedicated to public lighting projects. These projects can be relatively complex, often involving multiple municipalities within an aggregated framework, which makes the deal structure more intricate compared to typical building retrofits.

In contrast, residential buildings represent the least active sector for ESCO projects, consistently accounting for only 0-20% of total ESCO efforts across countries. This highlights a significant gap in the development of effective financing models to address the challenges inherent to residential energy efficiency, such as split incentives in social housing, rental properties, and difficulties in reaching consensus within owner-occupied communities. Furthermore, individual housing units are often too small to justify the scale required for ESCO involvement, limiting the market potential in this area.

Commercial buildings show slightly higher levels of ESCO engagement compared to the residential sector. However, only Uganda and the Philippines report a significant concentration of ESCO activity in this segment, with 61–80% of projects targeting commercial facilities.

There appears to be a correlation between the prevalence of single-technology approaches and the focus on commercial buildings - particularly in Taiwan (PRC), the Philippines, Malaysia, and Slovakia. This may suggest that simpler energy efficiency measures, such as LED lighting retrofits, are more easily agreed upon and implemented in commercial settings like shopping malls, where decision-making structures are often more centralized and project scopes less complex.

As with the residential sector, several barriers may limit broader ESCO involvement in commercial buildings. These include split incentives between tenants and property owners, as well as the absence of strong policy or financial incentives aimed at driving energy efficiency improvements in the private sector. The industrial sector is another key area of ESCO activity, with South Africa, China, Japan, Uganda, Türkiye, and Germany reporting substantial engagement (41-80%). This suggests that in these markets, energy-intensive industries are increasingly leveraging ESCO models to improve efficiency and reduce operational costs. The Chinese ESCO market is notably driven by a strong regulatory framework, in contrast to many other markets where regulatory influence appears to play a more limited role. There is ESCO participation in district heating and cooling in a few markets, notably China, Germany, UK, Thailand and Türkiye, but engagement is modest (21-40%). The presence of ESCOs in these markets suggests that district energy infrastructure is being prioritized for efficiency upgrades, but it is not a technology that enjoys general preference despite its energy efficiency benefits.

As with the residential sector, transportation remains a relatively underdeveloped area for ESCO engagement. Only South Africa, Hungary, and Thailand report moderate activity in this sector, with ESCO projects accounting for 21–40% of total efforts. The limited participation may be attributed to the complexity of applying traditional ESCO models to transport-related projects. This sector typically requires specialized expertise in fleet management or infrastructure-heavy solutions with extended payback periods - areas that fall outside the scope of most conventional ESCOs. As such, expanding ESCO involvement in transport is likely to require the emergence of a more specialized class of service providers, potentially able to integrate both energy efficiency, renewable energy-based electricity generation, battery back-up and EV charging.

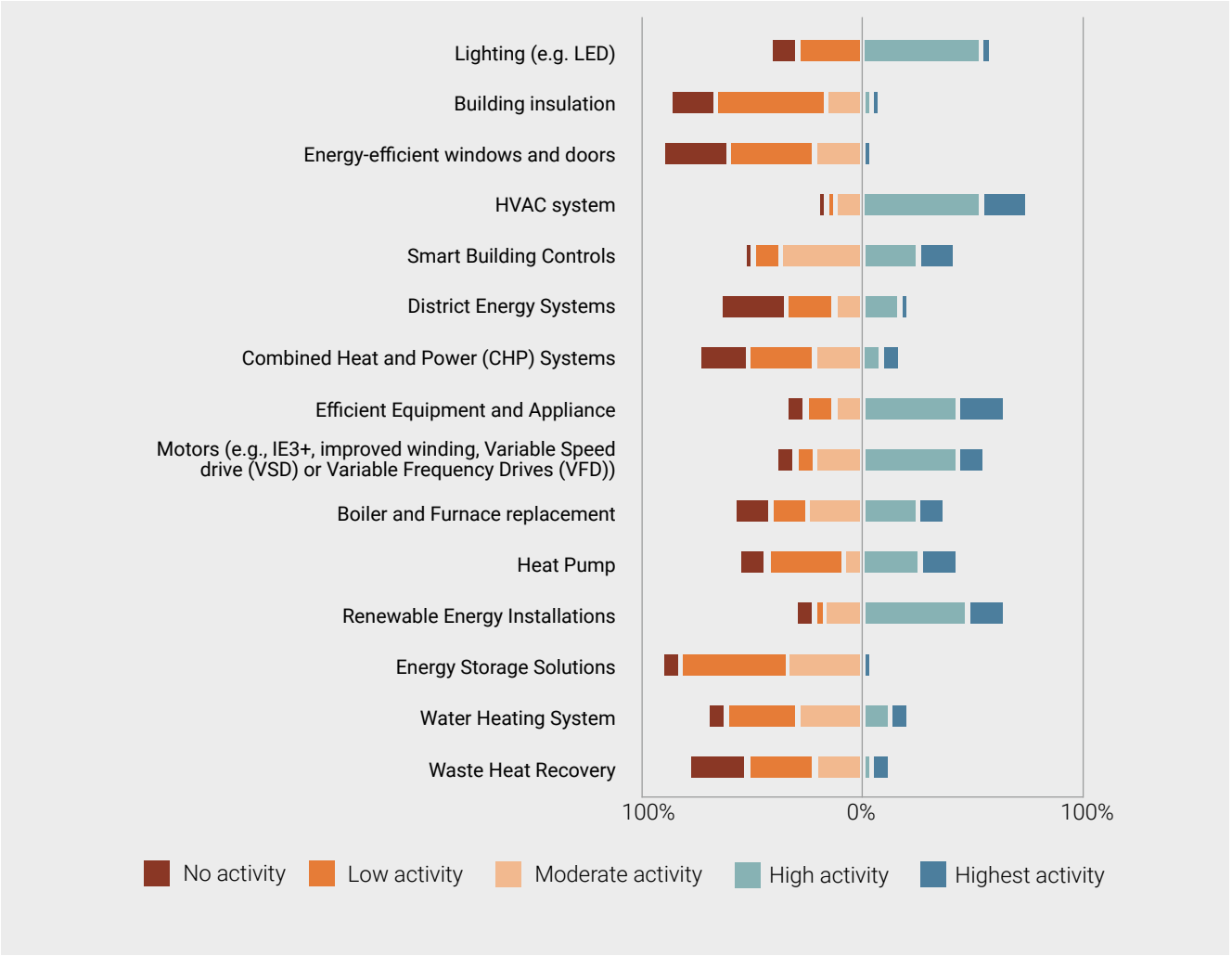
Other emerging areas for ESCO deployment include demand-side flexibility and energy storage, although only a handful of countries report moderate engagement in these fields, indicating that they are still at an early stage of development.

In contrast, energy supply projects appear more mature. Countries such as Germany and South Africa report 41–60% of ESCO activity in this area. While these supply-side projects differ in nature from traditional energy efficiency services - given that they involve the actual delivery of electricity rather than its reduction - they are increasingly being integrated with efficiency measures. This trend suggests growing demand for combined solutions, where ESCOs support decentralized energy production alongside improvements in energy distribution efficiency. Feedback from these markets may indicate that ESCOs are beginning to expand their service offerings beyond conventional models.

However, in most countries, this sub-sector remains largely unexplored, pointing to potential opportunities for ESCOs to expand their role in optimizing energy efficiency, energy generation and supply systems.

4.2 Technology Applications in ESCO Projects

Figure 2. ESCO activity across various technology applications



Building Energy Efficiency Technologies

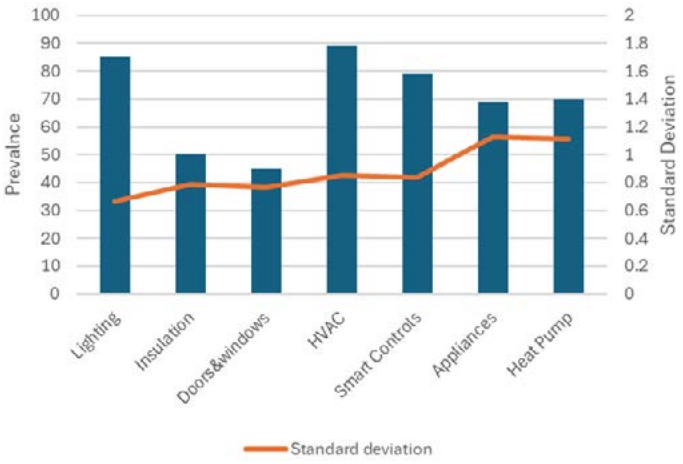
A closer look at the technologies deployed in building-focused ESCO projects in Figure 2 reveals that HVAC upgrades and lighting retrofits are the most commonly implemented measures across surveyed countries. These are closely followed by smart controls and energy-efficient appliances, which are gaining traction as digital technologies and efficient products become more accessible and impactful in optimizing energy performance.

In contrast, traditional thermal envelope improvements such as insulation and window or door replacements are reported far less frequently, even in colder climates. This suggests that the limited uptake of these technologies is likely not climate-driven but may instead reflect barriers such as long payback periods, higher capital costs, or logistical complexity.

To better understand the variability of technology deployment across markets, standard deviation was calculated for each technology category and is represented in Figure 3. From Figure 3, the analysis shows that lighting has both the highest prevalence and the lowest standard deviation, indicating its consistent deployment across markets - likely reflecting its maturity, low cost, and relatively straightforward implementation. HVAC technologies also show high adoption, although with slightly more variation, while smart controls and insulation reflect moderate variation.

By contrast, insulation and door & window upgrades not only show low levels of uptake but also relatively low variability, suggesting a consistently limited market penetration. The highest variation is observed in the deployment of appliances and heat pumps. While some countries report these technologies as significant ESCO activities, others report little to no activity. This widespread may indicate that these technologies are less mature in ESCO portfolios or more dependent on national market incentives and conditions, representing growth potential rather than saturation.

Figure 3. Building energy efficiency technologies deployment prevalence & standard deviation



Industrial and Supply-Side Technologies

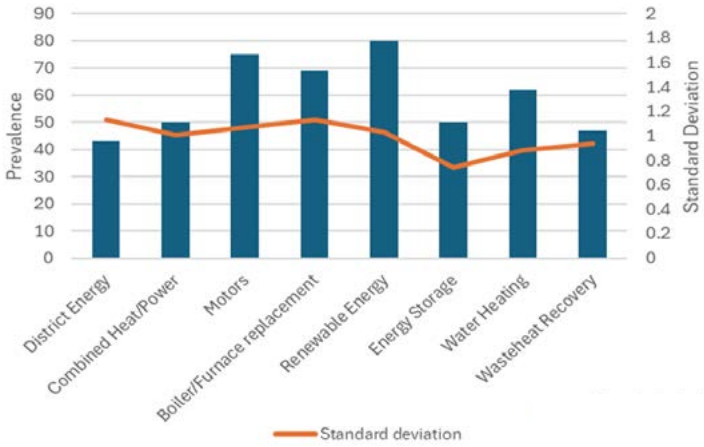
Compared to buildings-focused ESCO interventions, industrial and supply-side projects are reported less frequently across the surveyed countries, with average prevalence rates generally lower for most technologies - this assessment considers activity levels, not market size or investment value.

Among supply-side technologies, motors stand out as the most commonly reported, followed by renewables (primarily solar PV) and water heating systems. This reflects the continued emphasis on motor efficiency in industrial energy optimization strategies. The adoption of renewables may still be influenced by favorable policies, although the data suggests they are not yet dominant within industrial ESCO portfolios.

District energy systems, waste heat recovery, and energy storage technologies are among the least reported across countries. Waste heat recovery and district energy in particular show both low prevalence and low-to-moderate variability, suggesting either mature deployment in select countries or limited applicability in current ESCO business models. Energy storage is the only technology with consistently low prevalence and the lowest standard deviation, indicating that it remains a niche solution in most surveyed markets.

Standard deviation analysis (Figure 4) suggests that the industrial and supply-side ESCO market is relatively fragmented. Motors and renewables exhibit moderate variation, pointing to differences in national industrial structures, policy incentives, or technology readiness. Water heating systems show slightly greater variability, while energy storage exhibits uniform under-deployment across countries. Interestingly, no strong correlation is observed between climate zone and the adoption of water heating systems or renewables, which may point to other influencing factors - such as capital costs, energy price signals, or infrastructure availability - being more decisive in technology selection.

Figure 4. Industrial & supply-side technologies deployment & standard deviation



Compared to building-focused ESCO projects, which show high prevalence and consistency in measures like lighting and HVAC, industrial and supply-side technologies exhibit lower overall deployment and greater variability across countries. Building technologies tend to be more mature and widely implemented, while industrial measures - such as motors, renewables, and waste heat recovery - show fragmented uptake, likely reflecting differences in policy support, market readiness, and sector-specific complexity. Energy storage remains underutilized in both sectors, with particularly low adoption in industry.

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5. Contracting modalities in the Public & Private Sectors

ESCOs employ a variety of contractual models to deliver energy efficiency services, and this diversity is reflected in the findings of the 2025 Global ESCO Survey. The two most commonly used models are Energy Performance Contracts (EPCs) based on guaranteed savings and shared savings as seen in Figure 5. These dominate in both the public and private sectors, though the distribution of contract types varies significantly by sector and country.

In the public sector, guaranteed savings contracts are the predominant approach in many countries, including Poland, the United States, and Thailand. Other countries, such as South Korea, Malaysia, and Germany, employ a more diversified mix, incorporating shared savings EPCs, integrated energy contracts (IECs), and energy supply contracts with performance guarantees.

In contrast, the private sector demonstrates greater diversity in contracting approaches. Here, guaranteed savings and shared savings contracts are equally popular, but there is also notable use of chauffage, leasing models, performance-based supply contracts, and "as-a-service" models. These more flexible and often finance-driven arrangements are much less common in the public sector, likely due to procurement constraints or risk aversion within government institutions.

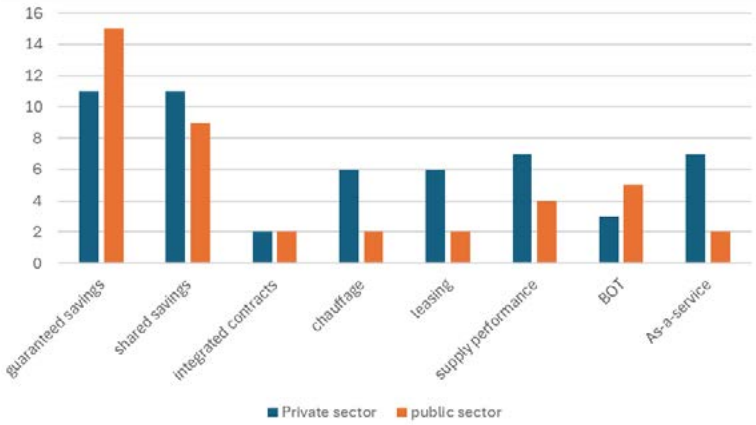
The variation in contracting modalities across countries and sectors is not easily explained. While differences may stem from regulatory frameworks, access to finance, or market maturity, no single factor fully accounts for the patterns observed.

One hypothesis is that financing mechanisms influence contract choice. For instance, both guaranteed savings and chauffage models rely on client-side financing, potentially making them attractive in contexts where ESCOs face capital constraints. However, this does not fully explain adoption trends: while shared savings models correlate strongly with the use of client funds, chauffage does not suggest that other factors, such as institutional familiarity or procurement norms, may be at play.

Public sector entities may also have easier access to low-cost capital, making it less economically attractive to request ESCOs to bundle financing into their offers. This could explain the public sector's preference for guaranteed savings contracts, where risk is minimized and financing is not necessarily expected from the ESCO. In the private sector, by contrast, businesses may be more open - or forced - to explore third-party or ESCO-provided financing, contributing to the broader range of contract models observed, including off-balance-sheet solutions.

Additional variation may relate to the complexity and flexibility of certain models. For example, "as-a-service" contracts, which offer long-term, open-ended service arrangements, may pose legal and procedural challenges for public sector procurement processes, thus limiting their adoption despite their attractiveness in private markets.

Figure 5. Prevalence of contracting modalities in private and public sector ESCO projects.



Business environment: Contract Duration, Payback, and Financing

Survey responses indicate considerable variation in ESCO project durations, particularly within public sector contracts. In a few countries - most notably the United States and Belgium - contracts can extend up to 30 years, although average contract lengths are shorter. These long-term con-

tracts typically reflect a high degree of market maturity, trust in the ESCO model, and a willingness to undertake deep renovations, including less cost-effective technologies such as thermal insulation and window and door replacements.

Most countries cluster around a 10-year average duration for public sector projects, including South Africa, Indonesia, the United Arab Emirates, Hungary, the Philippines, Slovakia, the Czech Republic, and the Netherlands. While this duration may be sufficient for simpler retrofits, it is likely too short to support comprehensive renovations, thereby limiting the full energy savings potential typically achievable in public buildings.

At the lower end of the spectrum, countries such as Taiwan (PRC), Türkiye, and Mexico report contract durations of just 3 to 5 years. These are also countries where single-technology interventions dominate, suggesting a possible correlation. While it is unclear whether short contract durations drive simpler interventions, or whether the use of single technologies constrains contract length, the result is likely limited energy efficiency gains in the public sector.

Table 4. ESCO projects contract durations, payback period and interest rates

	Common contract duration in years		Common payback time in years		PLR[1]	Common interest rate	
	Public sector	Private sector	Public sector	Private sector		Public sector	Private sector
Poland	15	-	11.5	-	7.7	7.5	9
South Africa	10	10	5	2.5	11	11	11
Taiwan	3	3	4.5	4.5	3	2	2.75
China	7.5	15	5	8	3.6	4	4
Malaysia	6.5	5	3.5	3.5	5.4	6.5	6.5
USA	20	5	20	-	8	4.7	-
Indonesia	10	5	3	3	8,5	7	5
Belgium	12.5	4	15	4	5	3.5	4.5
Japan	9	9.4	10	7	-	-	-
UK	8	5	10	5	4	0	-
South Korea	6	4	6	4	5.2	1.75	6.5
Uganda	5	2	5	2	10	25	28
Hungary	10	7	-	5.5	17	-	5
Philippines	10	12.5	5	5	7.7	10.5	10.5
Czech Republic	11	5	8.5	4.5	8.5	4.5	5.25
Germany	12.5	7.5	12.5	5	6	2	5
Slovakia	11.5	7.5	9	6	-	-	-
The Netherlands	10	5	-	-	-	-	-
México	4	5	3	3	11.8	18.5	18.5
Türkiye	5	3	3.5	2	-	8	8
Thailand	5	7	4	4	6.9	6.5	6.5
Average	10	6.7	7.6	4.5	-	6.4	7.3

1 Prime lending rate (PLR) source: https://www.ceicdata.com/en/indicator.

In the private sector, contracts tend to be shorter, with an average duration of 6.7 years. However, a few markets - including China, Japan, the Philippines, and Thailand - report longer private sector contracts than their public sector counterparts. These same countries also exhibit higher volumes of private sector ESCO activity, suggesting a greater degree of maturity and market confidence in this segment.

Elsewhere, five-year private contracts are typical in countries such as the United States, Indonesia, the United Kingdom, and Mexico. Contracts of this duration are likely limiting the complexity and scope of retrofits, leading to a greater focus on low-risk, quick-payback measures.

This spread not only reflects profitability but also highlights the importance of contract duration as a competitive factor in ESCO business models.

The difference between contract duration and payback period serves as a rough indicator of an ESCO's gross profit margin and overall business case strength. On average, public sector contracts show a 2.5-year difference between payback and total duration, which corresponds to approximately 25% on a typical 10-year contract. In the private sector, the average difference is similar - around 2.2 years - but since contract durations are generally shorter, averaging 6.7 years, this represents a proportionally larger margin of roughly 35%.

When comparing reported interest rates with prevailing prime lending rates, most ESCOs do not appear to face significantly higher financing costs - with the notable exceptions of Mexico and Uganda. Despite global interest rate volatility in 2023, these observations suggest that ESCOs with access to commercial financing are not broadly disadvantaged by banks. This implies a level of institutional trust in the ESCO model, at least in countries where capital access is not a primary barrier.

This may reflect that the reported rates are on older contracts, where interest rates were (significantly) lower, but at least for those ESCOs that are able to raise commercial loan financing for their activities, their business model does not immediately seem disfavored by the banking sector.

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6. ESCO Financing and its Challenges

Financing is a cornerstone of the ESCO business model - and often its greatest constraint. Unlike traditional service providers, ESCOs typically rely on performance-based repayment mechanisms, making access to finance and risk-sharing arrangements essential. This section provides an overview of current financing sources, instruments, and practices across more than two dozen countries. It also explores where the barriers lie, which financial innovations show promise, and how market context shapes access to capital for ESCO-driven projects.

Traditionally, project financing is reported as one of the key barriers to drive wider adoption of energy performance contracting (see Barriers for ESCOs 3rd Edition). Even if the interest rate offered to ESCOs for their business activities is to some extent dismissed as a barrier (as noted) above, this primarily refers to those ESCOs that are able to use commercial lending as a basis for their business. That is not true for all and not in all markets. Fortunately, there are other sources of finance and other financing instruments available (see the feature article after Chapter 8 for a novel approach to financing).

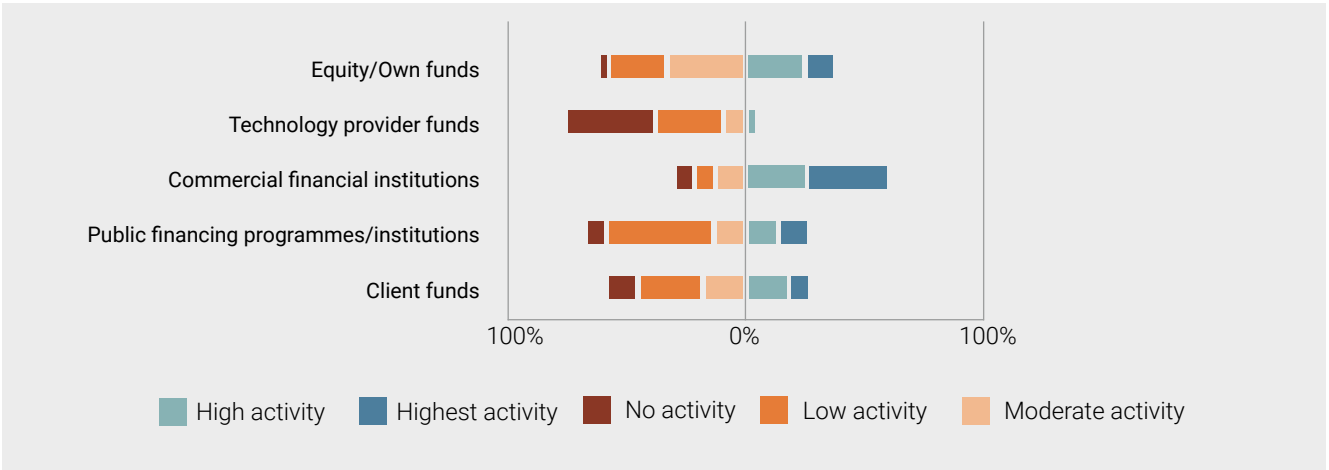
Financing Sources and Instruments for ESCO Projects

Recent survey data reveals significant diversity in both the sources of finance and the financial instruments used to support ESCO projects worldwide. These financing choices vary across countries depending on market maturity, access to capital, institutional support, and policy environments as seen in Figure 6.

Commercial financial institutions are the most frequently cited source of ESCO funding, particularly in the United States, China, the Philippines, Czech Republic, Slovakia, and Türkiye. In contrast, firms in Poland, Taiwan, Uganda, and other markets often rely on internal resources to initiate projects. Client contributions[2] also play a central role in several countries, including South Africa, Belgium, and the Philippines.

The use of public financing programs is more uneven. While the United Kingdom, Czech Republic, and South Korea report high engagement with public funding, others - such as Malaysia, Taiwan, and South Africa - indicate only moderate or limited use. Meanwhile, technology provider funds remain among the least utilized, with only South Africa and China reporting notable uptake.

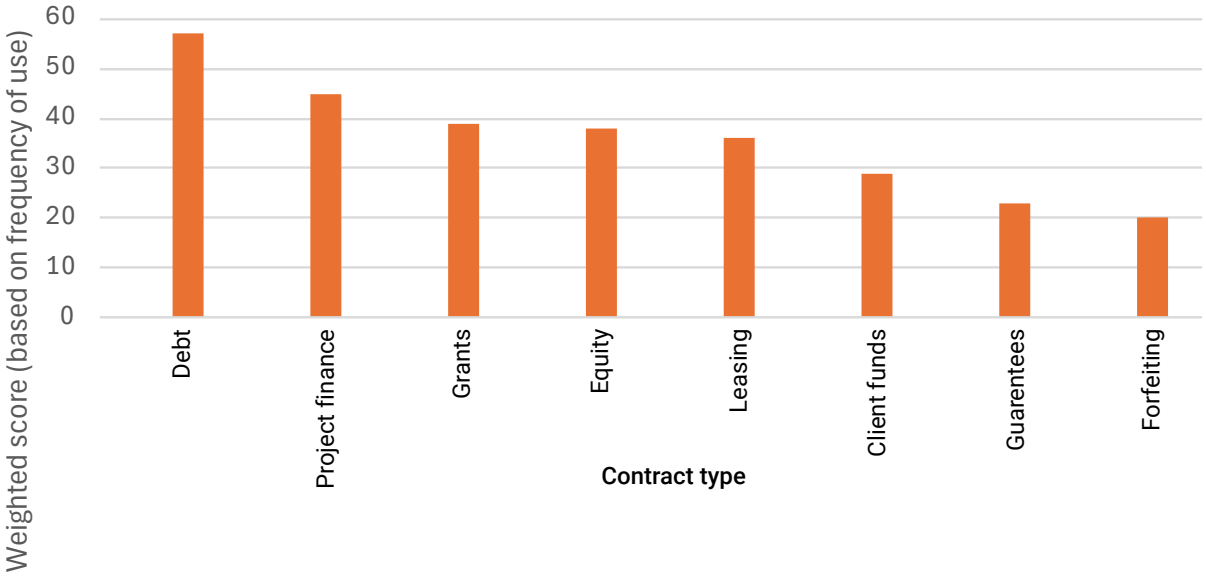
Figure 6. Overall Level of Use of ESCO financing sources



2 *Client contributions refer to any partial financial participation by the client in the financing of an energy efficiency investment. The client is typically the building owner, facility manager, or organization receiving the energy services*

These sources of funding often align with specific financial instruments, depending on how the funds are delivered and the structure of local markets (Figure 7). For instance, commercial bank finance is typically provided in the form of debt, which can also be wrapped into leasing contracts or forfeiting arrangements. Public financing may take the shape of grants, concessional loans, or guarantees, depending on the instruments available through national or local frameworks.

Figure 7. Relative Use of Financial Instruments in New ESCO Projects



Among financial instruments, debt financing remains the most widely used across nearly all the countries surveyed. It is followed by project finance, a structured model often combining debt with other tools. Despite its complexity, project finance is frequently or most used in nearly half of the countries surveyed, regardless of development level or public-private sector balance.

Grants are also widely applied, especially in mature markets like the UK, US, Czech Republic, Slovakia, and Germany. This is somewhat surprising given that financing is not a primary barrier in these markets, suggesting that grant funding is used to stimulate momentum in already active sectors. However, reliance on grants can raise concerns about market distortion, such as stop-go investment cycles or overdependence on subsidies. Their limited use in countries like China, Malaysia, Uganda, and Mexico underscores this contrast.

While equity financing is a logical component of ESCO models - especially when ESCOs co-invest in projects - it ranks only fourth in overall use. Countries such as Poland and Thailand show relatively high use of equity, suggesting a balanced financing structure. In contrast, places like the UK and the Philippines report lower reliance, potentially due to other available instruments or strong public sector involvement.

Leasing arrangements are used more selectively. They are prominent in Japan, Uganda, Hungary, and Türkiye but remain underutilized elsewhere. Their simplicity and predictability make them attractive for both less mature and well-established markets.

Guarantees continue to see low uptake, primarily due to the limited availability of functional schemes. Only a few countries, such as the United States and Indonesia, report widespread use, although interest in expanding access is growing.

The least adopted instrument is forfeiting - the sale of receivables to third parties - which is used primarily in a few countries, including the Czech Republic, Germany, and Slovakia. Despite its complexity, forfeiting has shown promise in the Czech market, where it now features in nearly half of all ESCO projects and is credited with driving client engagement and project acceleration.

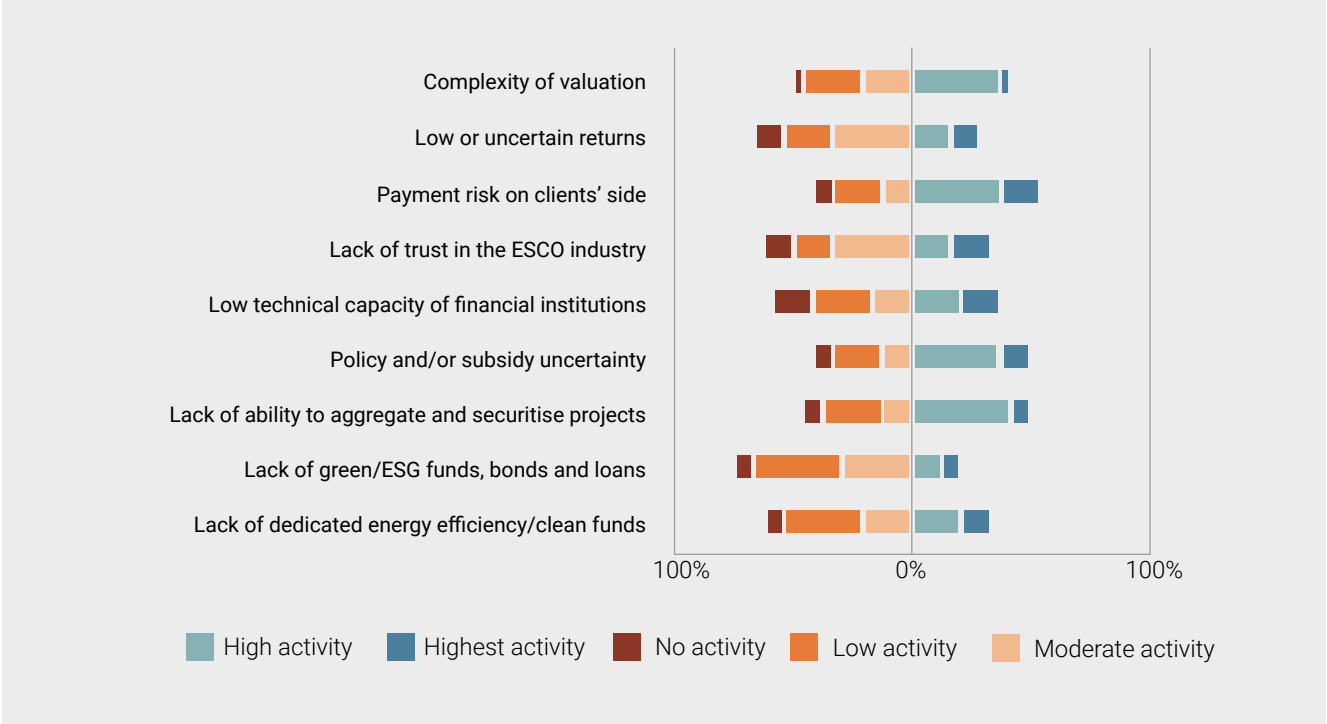
In summary, countries differ significantly in how they finance ESCO activity. Some rely on a broad mix of sources and instruments, while others focus on a narrower set. Understanding these country-specific configurations is essential for designing tailored financial strategies that can effectively support ESCO market development around the world.

Financial Challenges for ESCOs

ESCO markets around the world face varying degrees of financial challenges, shaped by policy environments, investor confidence, and access to capital. These challenges range from limited awareness of the ESCO model among financial institutions to policy instability and subsidy uncertainty.

The ranking of financial barriers for ESCOs (Figure 8) presents a comparative overview of the most critical financial obstacles reported globally. It reveals that uncertainty regarding policy and incentives, combined with limited understanding of ESCO business models among lenders, are among the most frequently cited barriers. Risk aversion in the financial sector and the lack of suitable financing instruments also feature prominently in the ranking. This underscores a widespread hesitation among investors and banks to engage with ESCO projects, particularly in emerging or less mature markets.

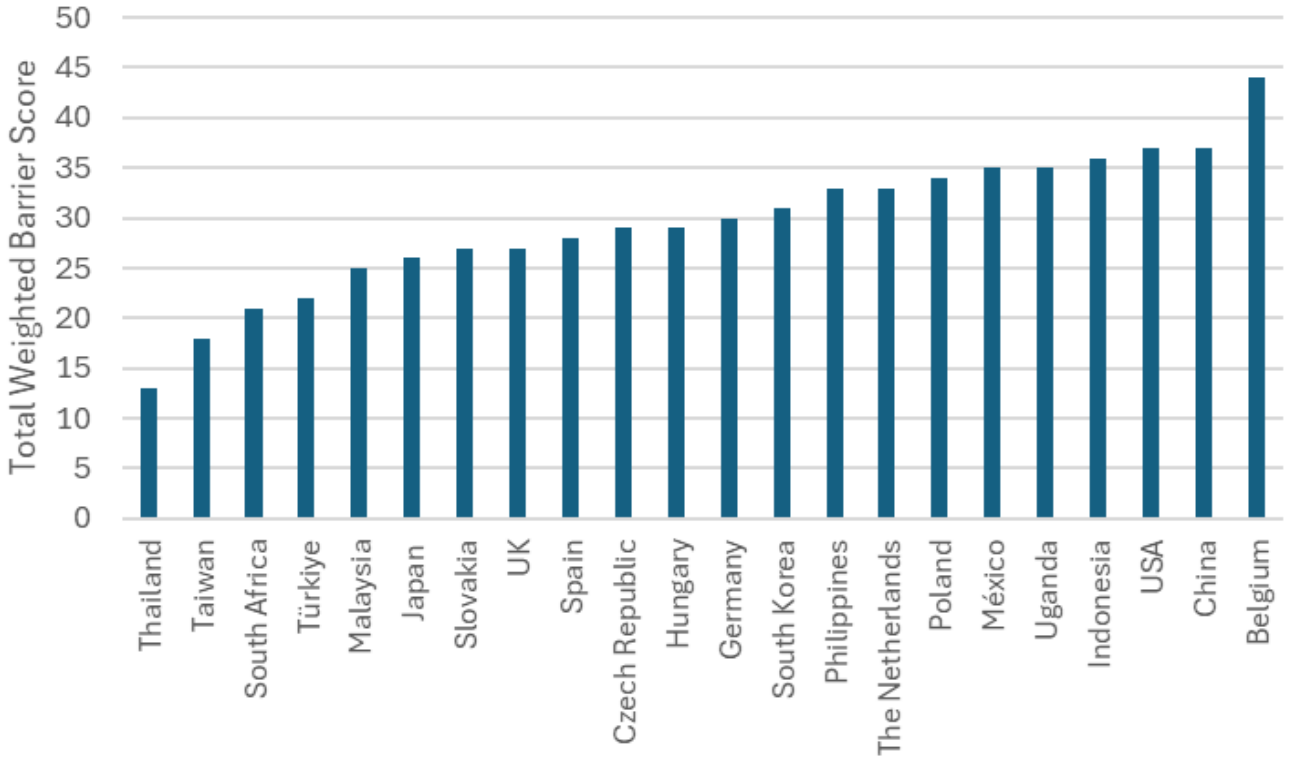
Figure 8. Ranking of financial barriers for ESCOs



Using a weighted analysis of barrier presence, Figure 9 below quantifies the severity of financial obstacles across different countries. It highlights stark disparities: Belgium, China, and the USA report the highest levels of financial barriers, whereas Thailand, Taiwan, and South Africa exhibit the lowest. This ranking reflects differences in regulatory maturity, market incentives, and the presence (or absence) of supporting financial instruments.

Countries like Uganda and Mexico face acute difficulties, including unclear policy frameworks, high perceived financial risks, and restricted funding access - factors that significantly hinder ESCO market development. Conversely, countries such as Germany, the Czech Republic, and Slovakia report relatively lower financial hurdles, indicating stronger enabling conditions for ESCO growth.

Figure 9. Weighted Presence of Financial Barriers in ESCO Markets by Country



Together, these figures underscore the importance of tailored financial strategies. In markets with high barrier scores, efforts should prioritize policy clarity, risk mitigation tools like guarantees, and the development of securitization mechanisms. Lower-barrier markets may benefit more from scaling innovative financing models and expanding green financial products.

Box 1: Overcoming Financial Barriers for ESCOs in India

ESCOs play a vital role in advancing energy efficiency in India. An analysis of 69 energy audit reports highlights an energy savings potential of 113 million kWh of electricity valued at USD 10.8 million per year. The required investment is estimated at USD 29 million with a simple payback period of 2.7 years.

Despite this potential, ESCO growth in India faces several challenges. Key barriers include limited access to affordable financing due to perceived high risks, inconsistent policies, lack of supportive regulatory frameworks, and low awareness among potential clients. Additionally, ESCOs struggle with limited technical expertise, inadequate measurement and verification (M&V) protocols, and a fragmented energy efficiency market lacking standardized contracts and procedures.

To address some of the financial barriers, the Partial Risk Sharing Facility for Energy Efficiency (PRSF) was introduced to support the development of the ESCO market. PRSF is a risk-sharing mechanism designed to mitigate client payment risks for ESCO projects. The program provides risk coverage for loans granted by Participating Financial Institutions (PFIs) and the Small Industries Development Bank of India (SIDBI) to ESCOs and client agencies implementing energy-saving initiatives.

PRSF consists of USD 37 million risk-sharing component managed by SIDBI and a USD 6 million technical assistance component. This facility provides partial credit guarantees to PFIs, covering a share of default risk associated with loans for eligible ESCO projects. As of December 2023, PRSF has supported 77 energy efficiency projects with a total project cost of approximately USD 94 million, offering guarantees worth USD 41 million. Sixteen projects have been completed, achieving annual energy savings of 372 GWh. Notably, MSMEs and municipal projects accounted for 60 of the 77 guaranteed projects.

The Bureau of Energy Efficiency (BEE) has played a key role in promoting ESCOs by developing implementation guidelines. These guidelines include provisions for detailed audits, a Request for Proposal (RFP) template, a shared savings agreement, and an ESCROW account mechanism to enhance payment security. By addressing financial risks and streamlining regulatory processes, India can unlock the full potential of ESCOs and accelerate the transition toward a more energy-efficient future.

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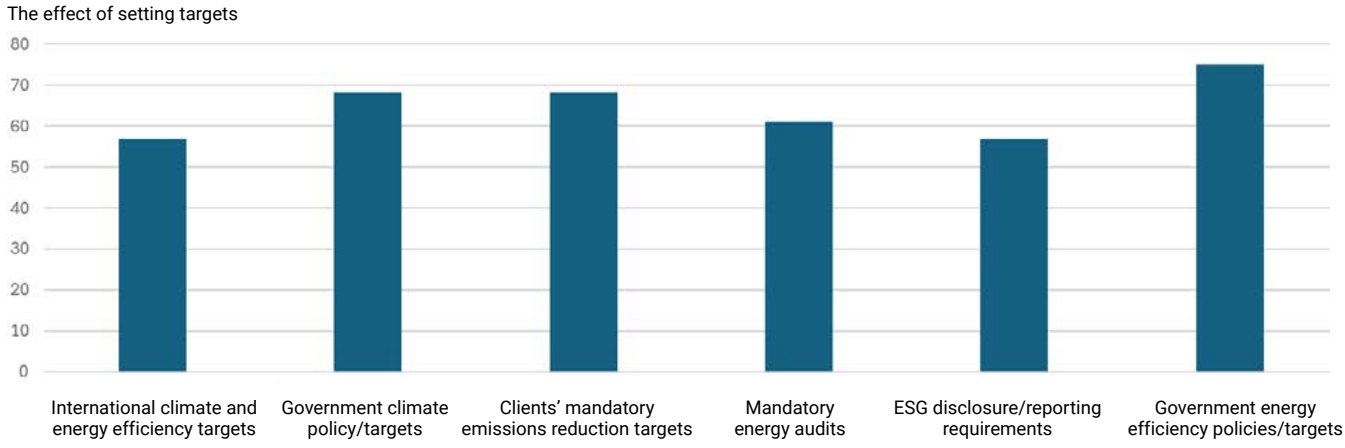
7. Policy & Regulatory Environment

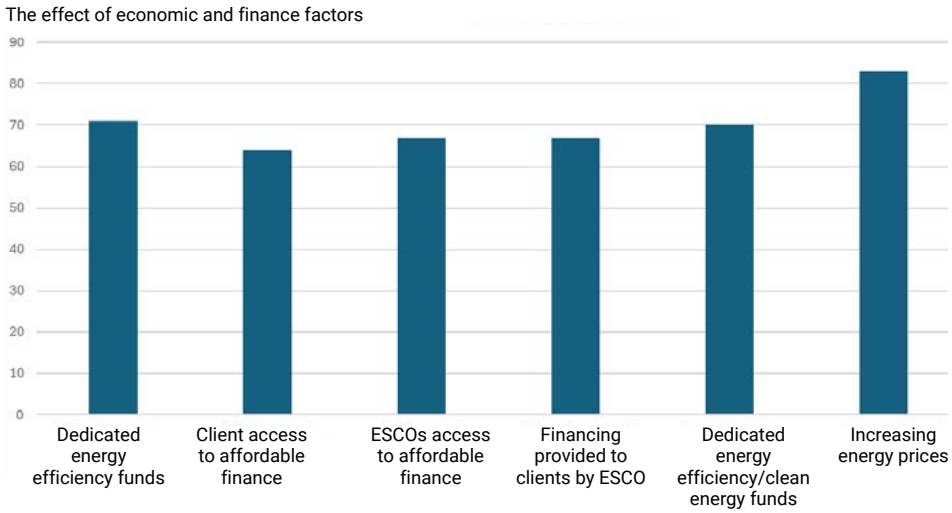
The success and scalability of ESCO markets depend not only on access to financing but also on a strong enabling policy and regulatory framework. While financial mechanisms remain critical, government policies, market regulations, and institutional support structures often determine whether ESCO markets thrive or stagnate. This section explores the key policy drivers and barriers shaping ESCO development globally, as well as how economic conditions and regulatory mandates influence market demand. Figure 10 and 11 categorize these influences into policy, financial, and contextual drivers, providing a comparative overview of what truly moves the market forward.

Figure 10. Perceived importance of target-setting and related policies for ESCO market growth



Among the most impactful policy tools is target setting, implemented at international, national, and even corporate levels. As shown in Figure 10, the perceived impact of targets increases with specificity and enforcement. While international agreements and broad sustainability goals have some influence, their effect becomes significantly stronger when translated into national mandates - particularly client-specific, mandatory energy efficiency targets. Emissions reduction goals also play a role, though secondary. Voluntary ESG reporting, by contrast, is perceived as having a relatively limited impact on ESCO demand, suggesting that mandatory, performance-based targets are more effective in driving market activity.

Figure 11. Perceived importance of financial and economic factors for ESCO market growth



On the financial side, economic drivers show a more consistent influence across markets (Figure 11). While most financial factors were rated similarly in importance, the price of energy clearly stands out as the most powerful driver of ESCO demand. This underscores the fact that cost savings remain a primary motivator for energy efficiency investments. On balance, economic and financial factors were rated as more influential than target-setting instruments - reinforcing the need for financially viable business models and pricing signals to complement policy frameworks.

Another prominent barrier highlighted by respondents was the difficulty in persuading public or private sector clients to enter into ESCO contracts. This challenge reflects both risk perception and low awareness or trust in the ESCO model, particularly in less mature markets. It points to a need for capacity-building efforts, demonstration projects, and de-risking mechanisms to build confidence among potential clients.

Interestingly, some factors often cited in ESCO discussions - such as project aggregation and technology development - were ranked relatively low in influence compared to the policy and financial drivers mentioned above. While relevant, they appear to play a more supporting role rather than acting as key market enablers.

Overall, the findings confirm that a well-structured policy environment, paired with favorable economic conditions and clear market signals, is essential for unlocking the full potential of ESCOs. Regulatory stability, enforceable targets, and strong client engagement mechanisms all contribute to a more predictable and investable market landscape.

8. Conclusion - Market Outlook & Future Directions

Results from the 2025 Global ESCO Market Survey highlight the vital role that ESCOs play in driving energy efficiency and advancing climate neutrality goals across a wide range of national contexts. The findings illustrate a highly uneven landscape marked by disparities in policy support, financing mechanisms, and the technologies deployed in projects.

Activity Concentrated in a Few Leading Markets

The data reveal that the majority of global ESCO activity - whether measured by project numbers, investment volumes, or energy savings - is concentrated in a few markets, notably the United States, China, Taiwan (PRC), and select European countries such as Spain, the UK, and Germany. These markets have benefited from mature policy frameworks, consistent public and private sector investment, and established institutional ecosystems that support the deployment of EPCs and innovative business models.

Other markets remain nascent or underdeveloped. Countries such as Mexico, Mali, and Indonesia reported minimal activity, reflecting persistent barriers such as weak regulatory environments, lack of access to financing, and limited stakeholder awareness. This disparity presents both a challenge and an opportunity: there is a significant untapped potential in emerging and developing markets, but it will require targeted policy reforms, capacity-building support, and blended finance strategies.

Financing: A Persistent Bottleneck

Access to finance continues to be one of the most significant challenges facing ESCOs globally. Despite the increasing involvement of commercial financial institutions in countries like the United States, Türkiye, and the Philippines, many markets still rely heavily on client funds or public financing programs. The availability and use of diverse financial instruments - such as guarantees, leasing, and project finance - is uneven across countries.

Financial risk - especially client payment uncertainty - is the top-ranked barrier in most markets. Innovative mechanisms such as risk-sharing facilities (e.g., India's PRSF) and green finance mechanisms offer replicable models that can help overcome some of these constraints, but broader replication, localized design, and policy support are needed to scale them effectively.

There is also evidence that financing ESCO contracts in the private sector often entails higher costs than in the public sector. This may incentivize a focus on shorter payback periods, which can in turn limit the technological scope of projects and reduce overall efficiency gains compared to potential savings.

Variation in Project Scope and Impact

ESCO project typologies vary widely, with some markets - such as Czech Republic, Belgium, and Poland - favoring integrated, system-wide renovations, while others, including South Korea and Taiwan (PRC), continue to focus on single-technology upgrades. Integrated approaches generally deliver higher energy savings and deeper decarbonization impacts, but they require stronger financial and technical capacity.

Markets aiming to scale their impact should consider introducing policy incentives, technical assistance programs, and aggregation tools that encourage system-level retrofits. Energy savings data reflect this variation: while countries like the USA and UK report average savings exceeding 35–50%, others, including Indonesia and Türkiye, remain well below that mark, often due to project scope and financing limitations.

Sectoral Opportunities Remain Underexploited

Public buildings dominate the global ESCO landscape, especially in the USA and parts of Europe, where procurement policies and government mandates have catalyzed project uptake. However, sectors such as commercial buildings, industry, transport, and energy supply remain underutilized

in many countries. Expanding ESCO participation into these sectors - particularly industry and commercial real estate - represents a key growth area, especially in countries with rising energy demand and growing urbanization.

Similarly, demand flexibility, energy storage, and supply-side efficiency technologies remain marginal in most markets. To accelerate decarbonization, policymakers and financiers should explore how to incorporate ESCO models to support these emerging technologies through enabling regulation and innovative contracting mechanisms.

Policy Drives Market Maturity

The report clearly shows that strong policy frameworks are a central enabler of ESCO market maturity. Countries with clear energy efficiency targets, procurement mandates, and financial incentives have consistently outperformed others in terms of project numbers, investment, and average savings. Conversely, policy uncertainty, lack of long-term targets, and unstable subsidy environments remain among the top-ranked barriers - particularly in markets that are stagnant or showing only limited growth.

While some markets have made substantial progress in mainstreaming ESCO models, a broader global alignment with international climate and energy efficiency targets - coupled with policy coherence and capacity building - will be essential to unlocking the full potential of ESCOs worldwide.

9. Frontloading and securitizing ESCO receivables – innovative financing at its best

This Feature article, addressing financing which is one of the prime challenges to ESCO industry development, is written by Csaba de Csiky, CEO of EnerSave Capital S.a.r.l. All views in the article are Csaba de Csiky's and do not necessarily represent those of the Global ESCO Network or UNEP-CCC.

"At EnerSave Capital S.à r.l., we firmly believe that failing to deliver on the energy transition will result in severe consequences for future generations. Our commitment is driven by a deep sense of responsibility to prevent that outcome - because the cost of inaction is far greater.

For the concept proposed in this article, some may wonder, "What's the catch?" The honest answer is - there isn't one." Csaba de Csiky

Introduction

To achieve the EU's energy transition objectives under the European Green Deal and to meet the European target of 90% GHG emissions reduction by 2040, an estimated €300 to €500 billion is needed annually until 2030 and after that EUR 800 billion annually[1], amounts that cannot be covered by public subsidies, so how do we then increase private investments?

Europe has struggled to develop capital markets[2], but there are no capital markets if there is no product, i.e. offerings of debt or equity. Any successful market, be it the New York Stock Exchange or the Istanbul souk, depends on the diversity and multitude of products being offered by many traders. The diversity in turn attracts buyers or investors. It is that simple.

Not only does a market need products. It also needs liquidity. Europeans' savings amount to EUR 35 trillion, 10 trillion of which is sleeping in bank accounts.[3] Since October 2023, new EU regulation for Crowd Funding Service Providers or CFSP's has been in effect, allowing the 594[4] European Crowd Funding Service Providers (ECSP) across Europe to raise more than €11 billion.

The public sector has struggled for decades to encourage investment in energy efficiency, mostly through ineffective or expensive incentives, mainly grants for investments that are already very profitable. A relatively new innovation in a few markets is white certificates (WhC), representing a unit of energy saved and usually issued by government agencies for specific implemented projects together with energy savings targets on energy suppliers or distributors. To create an incentive for the creation of WhC, these must at the end of a period own a certain number of white certificates. This creates a market demand for energy savings – as it artificially introduces scarcity – and in theory provides a flexible mechanism to meet energy savings targets at the lowest aggregate cost.

WhC is the promise of a cash flow from investment in for example infrastructure renovation, large-scale changing of light bulbs or deep building rehabilitation, but it is not a financing solution in itself. However, financial products can be structured around it with the purpose of redirecting not only the above largely untapped 10 trillion of private finance, but also traditional sources of capital into energy efficiency investment. If structured as proposed here, the Energy Service Company is the obvious vehicle to activate these investments to speed up the green transition.

Scaling the ESCO market

The ESCO industry has made it its business to provide energy efficient solutions on an Energy Performance Contract (EPC) or As a Service (AaS) basis. But the ESCOs' traditional route of approaching commercial banks is often met with lengthy questioning due to limited understanding by bank case officers of the ESCO model. They find themselves in a difficult spot on 3 fronts.

- When banks or investors are willing to fund their projects which will generate savings and cash flows in the future, they are looking for an equity sliver between 5 to 15% of the ESCO which very often they do not have, or it is tied up in other projects.

- If WhC or grants are available, is generally coming post inauguration of the installation, such event actually being the trigger for the release of WhC, commonly released over time as saving are realized.

- In general, project financers will want to know that once the project is up and running, it can be off-loaded, so that principal can be repaid to the lender.

In traditional banking, these are often insurmountable barriers that leave the ESCOs capital constrained. Instead, the ESCOs must engage directly with capital market gatekeepers: the investment bankers, who are paid on results and deal-flow and therefore are interested in getting transactions funded. Once Investment Bankers understand an asset class and they have convinced their investor base of the benefits, they will want to have more of the same to create more product to sell to the same clients, i.e. in the case of ESCOs, stable cash flows which ESCOs deliver. The only requirement this group has is scale - which is easily offered by the EU investment prospects.

But for the ESCOs to deliver on such scale, they need:

- Non-dilutive quasi equity, and

- Regular deleveraging and derisking of their portfolio via securitization

The WhC can be the starting point.

Concept & structure

In any kind of debt finance relationship, debt providers are looking for a certain element of equity from the borrower. Furthermore, particularly in project finance, the funding party needs clarity on the repayment process which necessitates a sales process. In real estate it is "off the plan" sales; in Solar PV, it is expression of interest for buying a developed power plant, or alternatively Power Purchase Agreements (PPA). Both parties would want to end the lending arrangement sooner rather than later. The financier because he wants to exit the risk; the borrower because he wants to have better funding terms, as project finance is inherently expensive.

Step 1: Front-Loading Future Revenues from White Certificates (WhC)

In any project ESCO-driven project, equity of 5-15% of total capex will be drawn down in various stages of project completion. If the ESCO does not have such amounts available and cannot raise capital from 3rd parties, it may embark on front loading of future WhC revenues, which requires the following conditions to be met:

a. The project needs to be entitled to WhC and the future allocation agreed (quantity and price).

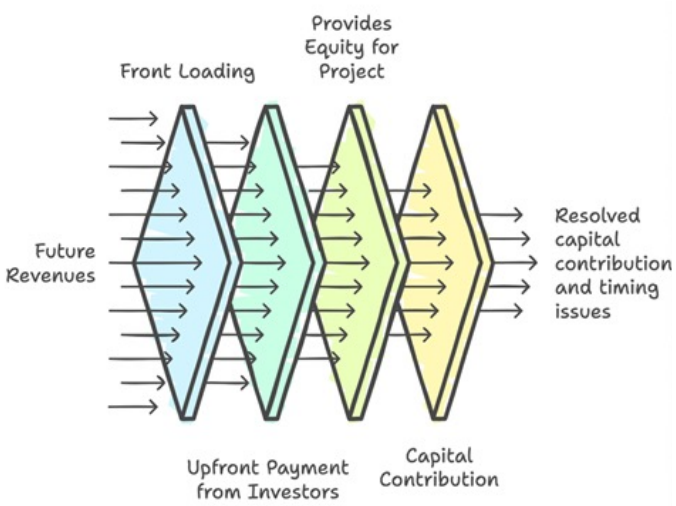
b. A buyer of the prospective WhCs must be identified (probably requiring a maximum project completion time, e.g. 365 days

c. The buyer will acquire the WhC allocation via a compartment of a securitization vehicle.

d. Once the funds are raised, the depositary will hold these funds in escrow or deposit it with the ESCO's lending partners in lieu of equity on the ESCOs behalf, to unlock the agreed funding.

e. Once the project is implemented, the ESCO will release the WhC counter value to the depositary, who will repay the investors.

Figure 12. Streamlining revenue and capital flow



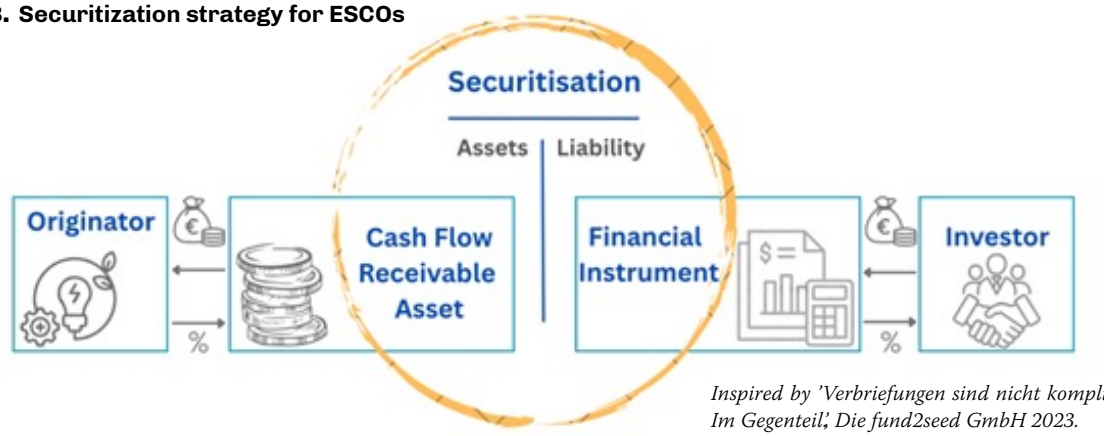
This first step, resulting in an upfront payment of WhC entitlements, resolves timing and capital contribution issues for the ESCOs' investment on behalf of their EPC-clients, but in order to increase their deal capacity, a second step is to find an exit route for the ESCO to refinance the project via securitization, thus allowing full repayment to the project financer.

Step 2: Securitization

Once the transaction is producing the expected stabilized cash flows, a securitization vehicle must acquire those forward-looking cash flows for Step 2 to succeed. To do that, the securitization vehicle must repackage them depending on the average maturity of the cash flows and transform them into a bond or note, which again it will place with investors. This will allow the ESCO to repay the original lending institution, freeing up its balance sheet, which is the core borrowing "glass ceiling", to take on further business. As the initial lender has been repaid on time and in full, he is keen to engage in a follow-on loan. Securitization removes the ESCO's financial risk, which has been shifted to the bond holders.

A successful securitization strategy, as exemplified by car finance companies – which re-finance close to a trillion Euros annually – hinges on achieving standardization, transparency, and a solid contractual foundation for the underlying receivables. Energy efficiency and sustainable energy assets based on EPC have these characteristics. This, paired with an efficient, low-cost securitization platform and effective distribution channels of the resulting securitized energy assets, can engage the right investor group and reduce costs associated with this kind of transaction.

Figure 13. **Securitization strategy for ESCOs**



Inspired by 'Verbriefungen sind nicht kompliziert. Im Gegenteil,' Die fund2seed GmbH 2023.

Getting the securitization conveyor belt rolling

All of this takes planning and assembling the right team to scale this market opportunity with a focus on engaging the core stakeholders, including the ESCOs. The annual 800 billion euro needed for the energy transition is certainly such an opportunity.

Securitisation is a financing technique by which homogeneous income-generating assets – which on their own may be difficult to trade – are pooled and sold to a specially created third party "securitisation vehicle", which uses them as collateral to issue securities and sell them in financial markets. This allows lenders and originators to reduce funding costs and increase their funding capacity while still satisfying regulatory capital requirements and it may even have broader economic and social benefits.

Homogeneous income-generating assets require a homogeneous basis, a standardized contract devoid of 'lawyer meddling' focused on assuring periodic payments over an extended time horizon. With a parallel to the car industry; you can specify anything when ordering a car, but the leasing contract is standardized. For a price you can have a car which is pink with blue dots, but paragraph 27/3 on page 2 is non-negotiable. Using the same contract, to the dot, for every transaction reduces due diligence cost for project financers and securitization service providers and engages both sectors. Under the Lighthouse Horizon project

LAUNCH, the partners, including EnerSave Capital, have developed such a standard, which in addition is off-balance sheet for the end client under GAPP and IFRS 16.

Standardization further addresses that securitization for smaller transactions is nay to impossible due to the costs associated. Standardization, from onboarding clients and analyzing receivables to drafting the prospectus, will reduce traditional securitization costs by a factor of ten, making smaller transactions viable.

Be upfront with project financers

For a price, the finance sector itself may engage in getting a structure up and running. It's expensive money and requires a bit of equity and thus it needs refinancing sooner or later. If not a request by the financing party, then it is in the best interest of the borrowing party to eventually seek cheaper long-term funding.

By bringing the project financier into the overall funding structure right from the beginning, he will know that once the project is up and running and produces stable cash flow, the ESCO will most likely want to deleverage and refinance, ensuring that the project financier has repeat business.

The securitisation proposition per se has been proven by the Automotive sector, where the various leasing or loan agreements, derived from the distribution of cars and trucks are regularly securitised and sold to investors looking for this kind of credit risk. To build the securitization model for energy efficiency receivables, a central securitization know-how center, initiated with the participation of financiers, could create securities which various crowds funding service providers, the ECSPs, can distribute, e.g. as retail green bonds, whilst indirectly allowing the securitization provider to process numerous small transactions.

By giving ECSPs this additional product to distribute, they may ultimately be able to activate (some of) the 10 trillion lurking in bank accounts by giving access to green fixed-income products, while ESCOs in the other end of the value chain can deleverage and grow. As ESCOs expand, they will generate more receivables, eventually meeting institutional investors' requirements, which then unlocks the larger pools of capital.

Summary

By front-loading future WhC entitlements as the "equity piece" in EPC-based investments, the necessary conditions for transactions to happen are established. Furthermore, by creating the deleveraging of the ESCO's balance sheet via securitization, the limitation of the ever present "glass ceiling" limiting the taking on of further debt by the ESCO for balance sheet reasons is removed, while in most cases also allowing the ESCO to replace high-cost finance products with a lower-cost ones, removing the client risk from its balance sheet. Ultimately, by enabling ESCO to access capital markets, it can establish a strong track record and investor base, which over time can lead to reduced financing costs and increased demand for larger issuances.

The core remedy is the streamlining of the transaction execution process by minimizing duplication and inefficiencies, ensuring a competitive cost structures without compromising on the high-quality standards that investors rightly expect.

1 https://www.eunews.it/en/2024/02/23/too-much-money-sleeping-in-the-banks-eurozone-wants-to-wake-it-up/
2 https://www.linkedin.com/posts/andreas-treichl_by-the-end-of-2024-households-in-the-eu-activity-7171454018303504384-G1m-
3 Ibid.
4 https://www.turbocrowd.it/en/crowdfunding-in-europe/

Annex A: List of survey respondents

Survey Respondents	
Asia Pacific	
China	ZGC Energy & Environment Service Industry Alliance (EESIA)
India	Alliance for an Energy Efficient Economy (AEEE)
Indonesia	Energy Consultant and EPC: Asosiasi Perusahaan Penunjang Konservasi Energi Indonesia (APKENINDO)
Japan	Japan Association of Energy Service Companies (JAESCO)
Malaysia	Malaysia Association of Energy Service Companies (MAESCO)
Philippines	Philippine Energy Efficiency Alliance (PE2)
South Korea	Korea Association of ESCO (KAESCO)
Taiwan (PRC)	Taiwan Energy Service Association (TESA)
Thailand	Thai ESCO Association (ThaiESCO)
Europe & Central Asia	
Belgium	Belgian ESCO Association (BELESCO)
Czech Republic	Asociace poskytovatelů energetických služeb (APES)
Germany	Deutschen Unternehmensinitiative Energieeffizienz (DENEFF EDL_HUB)
Hungary	Hungarian National Association of Enterprise Developers (MVOSZ)
Poland	Academic / EPC expert
Slovakia	Asociácia Poskytovateľov Energetických Služieb (APES)
Spain	Asociación de Empresas de Servicios Energéticos (ANESE)
The Netherlands	ESCoNetwerk (PPS Netwerk)
Türkiye	Energy Efficiency and Management Association (EYODER)
United Kingdom	EEVS - Independent verifier of EPCs: Energy Services and Technology Association (ESTA)
Middle East & Africa	
Mali	Network of Experts for the Promotion of Energy Efficiency and the Integration of Gender in Access to Energy in Mali (REE-IGEM)
South Africa	ESCO Association of South Africa (EASA)
United Arab Emirates	Clean Energy Business Council (CEBC)
Uganda	Energy Efficiency Association of Uganda (EEAU)
North & Central America	
México	Asociación Nacional de Empresas de Eficiencia Energética (AMENEER)
United States of America	National Association of Energy Service Companies (NAESCO)

Annex B: Survey Questions

The questionnaire used to gather the information used to produce the Global ESCO Market Analysis 2025 was distributed to the Global ESCO Network's partner associations and experts and contained the following substance questions:

National ESCO Market

4. Number of active* ESCO projects
** Active projects that have reached contract signature and are in construction or service delivery phase*

5.Number of new ESCO projects last year

6. Total investment (not contract value) in active ESCO projects (in USD)**
*** Investment outlay: In case the clients co-invested (also invested), please include the value of these investments in total*

7. Total investment (not contract value) in new ESCO projects last year (in USD)**
** Investment outlay: In case the clients co-invested (also invested), please include the value of these investments in total

8. Size of Energy Savings (MWh/year) for new ESCO projects***
**** If results can only be given in another unit, please specify the unit used.*

9. Energy Savings (%) for new ESCO projects****
***** Average energy savings in the ESCO projects in %, compared to baseline energy consumption*

10. Please rate the total value of new contracts compared to the previous year:
From 'strong decline' to 'strong growth'

ESCO Project Types

11. What percentage of projects were implemented as (the sum of both should add up to 100%):
a. The replacement of selected components (single technology or type of action/intervention)

b. Integrated / systems renovations using multiple technologies and types of actions/interventions

12. Which sub-sector do active ESCO projects belong to?
Percentage estimate distributed among Public buildings, Commercial buildings, Residential buildings, District heating/cooling, Industry, Transport, Public lighting (street and traffic), Demand flexibility & energy storage, Energy supply

13.How important were each of the following technologies to your activities this year?
Please rate on a scale from 0 (No Activity) to 5 (Highest Activity)

Lighting, Building insulation, Energy-efficient windows and doors, HVAC Systems, Smart Building Controls, District Energy Systems, Combined Heat and Power (CHP) Systems, Efficient Equipment and Appliances, Motors, Boiler and Furnace replacement, Heat Pump, Renewable Energy Installations, Energy Storage Solutions, Water Heating Systems, Waste Heat Recovery

ESCO Activities in the Public and Private Sectors

14. What is the most common contract modality in the public sector?
Please rate the following options on a scale from 0 (Not used) to 5 (Most used)
Energy Performance Contract (EPC) – guaranteed savings, Energy Performance Contract (EPC) – shared savings, Integrated energy contracts (IEC), Contract energy management (chauffage), Leasing contract, Energy supply contract – per-

formance guarantee, Build – Own – Operate – Transfer, Energy/energy efficiency/heat/cooling/air as a service

15. What is the most common contract modality in the private sector?
Please rate on a scale from 0 (Not used) to 5 (Most used) of the following
Energy Performance Contract (EPC) – guaranteed savings, Energy Performance Contract (EPC) – shared savings, Integrated energy contracts (IEC), Contract energy management (chauffage), Leasing contract, Energy supply contract – performance guarantee, Build – Own – Operate – Transfer, Energy/energy efficiency/heat/cooling/air as a service

16. What is the most common duration of ESCO projects in the public sector
Please provide your best estimate in years.

17. What is the most common duration of ESCO projects in the private sector?
Please provide your best estimate in years

18. If you borrow to finance projects, what is the most common interest rate on loans in public sector projects (in %)?

19. If you borrow to finance projects, what is the most common interest rate on loans in private sector projects (in %)?

20. What is the most common payback time (i.e., simple payback period of capital equipment) for ESCO projects in the public sector?

21. What is the most common payback time (i.e., simple payback period of capital equipment) for ESCO projects in the private sector?

Financing ESCO Activities

22. Which sources of finance were used in new ESCO projects last year?
Please rate the following options on a scale from 0 (Not used) to 5 (Most used)

Equity / Own funds, Technology provider funds, Commercial financial institutions, Public financing programmes/ institutions, Client funds

23. What types of financing were used in ESCO projects last year?
Please rate the following options on a scale from 0 (Not used) to 5 (Most used)
Equity, Debt, Grants, Guarantees, Project finance, Leasing, Forfeiting

24. What are the main challenges in obtaining viable finance for ESCO projects?
Please rate the following options on a scale from 0 (No challenge) to 5 (biggest challenge)

Complexity of valuation, Low or uncertain returns, Payment risk on clients' side, Lack of trust in the ESCO industry, Low technical capacity of financial institutions, Policy and/or subsidy uncertainty, Lack of ability to aggregate and securitise projects, Lack of green/ESG funds, bonds and loans, Lack of dedicated energy efficiency/clean funds

25. List the top 3 policies and/or regulations that, in your opinion, are most effective in supporting and growing the ESCO market. If possible, kindly include links for further reference.

26. Please rank the following factors in terms of influencing the growth of the ESCO market?
Please rate the following options on a scale from 1 (lowest effect) to 5 (highest effect)

Increasing energy prices, Government energy efficiency policies/targets, Government climate policy/targets, Availability of dedicated energy efficiency funds, Aggregation of projects, ESG disclosure/reporting requirements, Mandatory energy audits, Difficulty in persuading a private or public sector to enter an ESCO contract (e.g. due to their lack of experience or capacity to assess risks and procure ESCO services), Client access to affordable finance, ESCOs access to affordable finance, Financing provided to clients by ESCO, Clients' mandatory emissions reduction targets, Technology development, Securitization (i.e. asset backed securities), Dedicated energy efficiency/clean energy funds, International climate and energy efficiency targets

27. Do you have any specific case studies / success stories that you would like to share?

Annex C: Response Tables

ESCO activities in building energy efficiency technologies

	HVAC System	Lighting (e.g. LED)	Efficient Equipment & Appliances	Heat Pump	Smart Building Controls	Building insulation	Energy-efficient windows and doors
Poland							
South Africa							
Taiwan (PRC)							
China							
Malaysia							
USA							
Indonesia							
Belgium							
Japan							
UAE							
Mali							
UK							
South Korea							
Uganda							
Hungary							
Philippines							
Czech Republic							
Germany							
Slovakia							
The Netherlands							
México							
Türkiye							
Thailand							

Highest activity High activity Moderate activity Low activity No activity I dont know

ESCO activities in supply side technologies

	Energy Storage Solutions	Water Heating System	Waste Heat Recovery	District Energy Systems	Combined Heat and Power (CHP)	Renewable Energy Installations	Boiler and Furnace replacement	Motors
Poland								
South Africa								
Taiwan								
China								
Malaysia								
USA								
Indonesia								
Belgium								
Japan								
UAE								
Mali								
UK								
South Korea								
Uganda								
Hungary								
Philippines								
Czech Republic								
Germany								
Slovakia								
The Netherlands								
México								
Türkiye								
Thailand								

Highest activity High activity Moderate activity Low activity No activity I dont know

ANNEX C

Factors driving ESCO market growth

	Increasing energy prices	Government energy efficiency policies/ targets	Government climate policy targets	Availability of dedicated energy efficiency funds	Aggregation of projects	ESG disclosure/reporting requirements	Mandatory energy audits	Difficulty in pursuading clients to enter an ESCO contract
Poland								
South Africa								
Taiwan								
China								
Malaysia								
USA								
Indonesia								
Belgium								
Japan								
UAE								
Mali								
UK								
South Korea								
Uganda								
Hungary								
Philippines								
Czech Republic								
Germany								
Slovakia								
The Netherlands								
México								
Türkiye								
Thailand								

Highest effect High effect Moderate effect Low effect Lowest effect I dont know

Factors driving ESCO market growth

	Clients access to affordable finance	ESCOs access to affordable finance	Financing provided to clients by ESCO	Clents' mandatory emissions reduction targets	Technology development	Securitization (i.e. asset backed escurities)	Dedicated energy efficiency/clean energy funds	International climate and energy efficiency targets
Poland								
South Africa								
Taiwan								
China								
Malaysia								
USA								
Indonesia								
Belgium								
Japan								
UAE								
Mali								
UK								
South Korea								
Uganda								
Hungary								
Philippines								
Czech Republic								
Germany								
Slovakia								
The Netherlands								
México								
Türkiye								
Thailand								

Highest effect High effect Moderate effect Low effect Lowest effect I dont know

THE GLOBAL ESCO NETWORK

UN environment programme | copenhagen climate centre