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Role of energy service companies (ESCOs) in promoting energy efficiency

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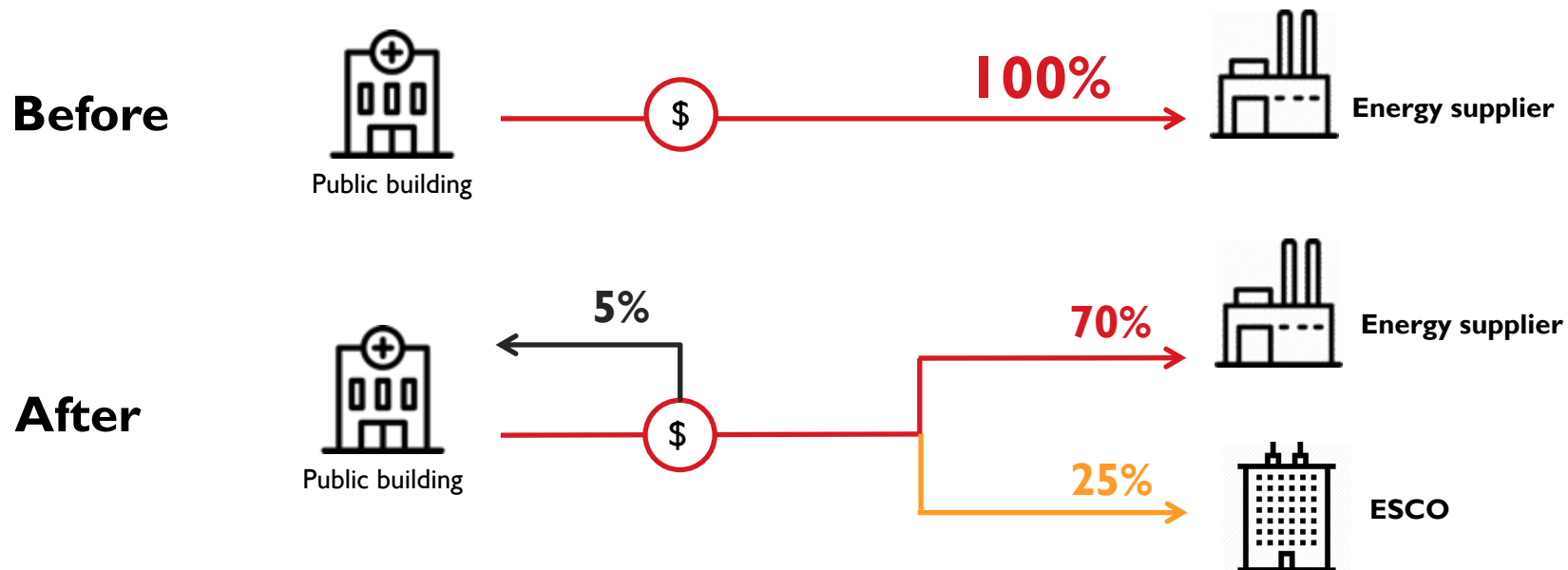
INTRODUCTION TO ESCO CONCEPT



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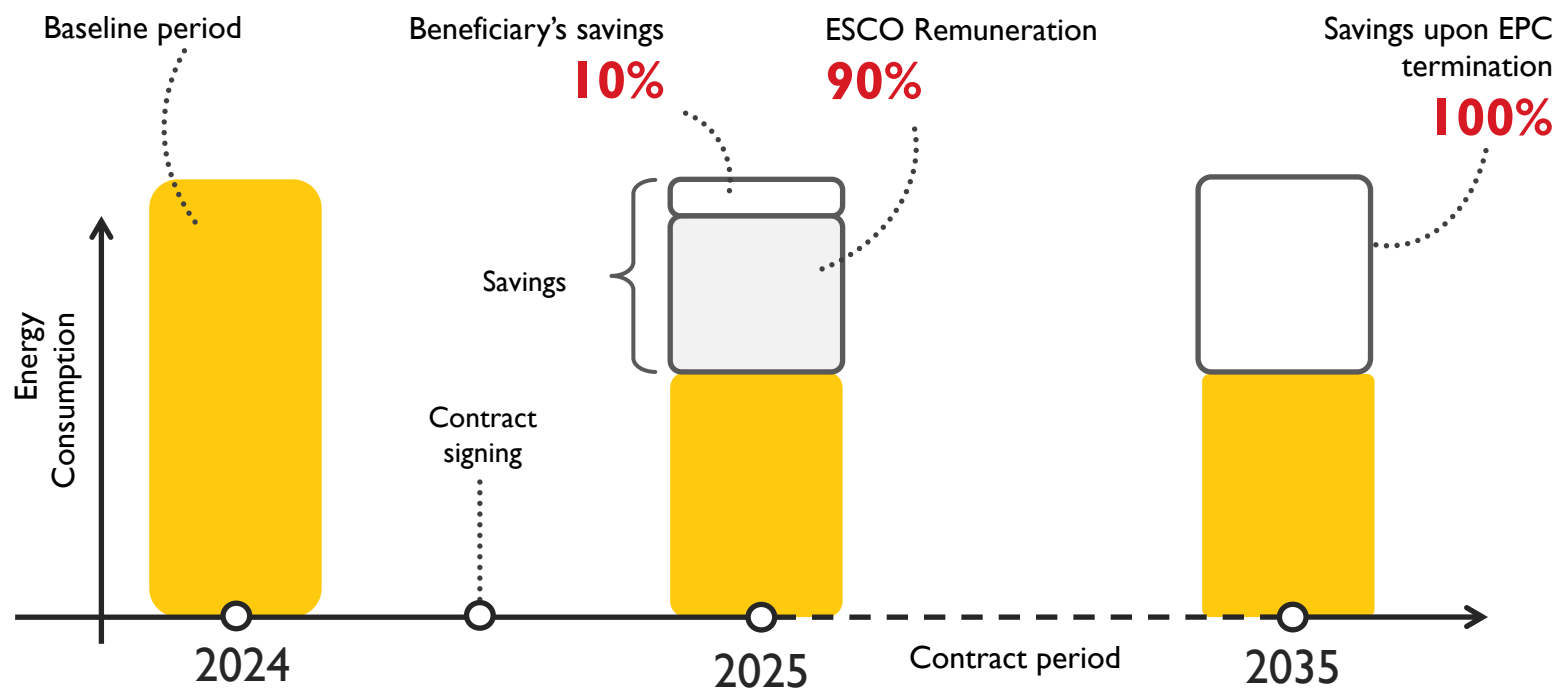
UNDERSTANDING ENERGY PERFORMANCE CONTRACTING (EPC)

Definition of EPC Agreement: a contractual arrangement between a beneficiary and a provider (normally an ESCO), where the investments in that project are paid for in relation to a contractually agreed level of energy efficiency improvement or other agreed performance criteria.



UNDERSTANDING ENERGY PERFORMANCE SERVICES

Energy Performance Services: Services that focus on improving the energy performance of a facility through renovations, upgrades, and efficiency measures. The key characteristic of these services is that their results (in terms of energy savings) are quantitatively confirmed and tracked over time.



PURPOSE OF ESCOs

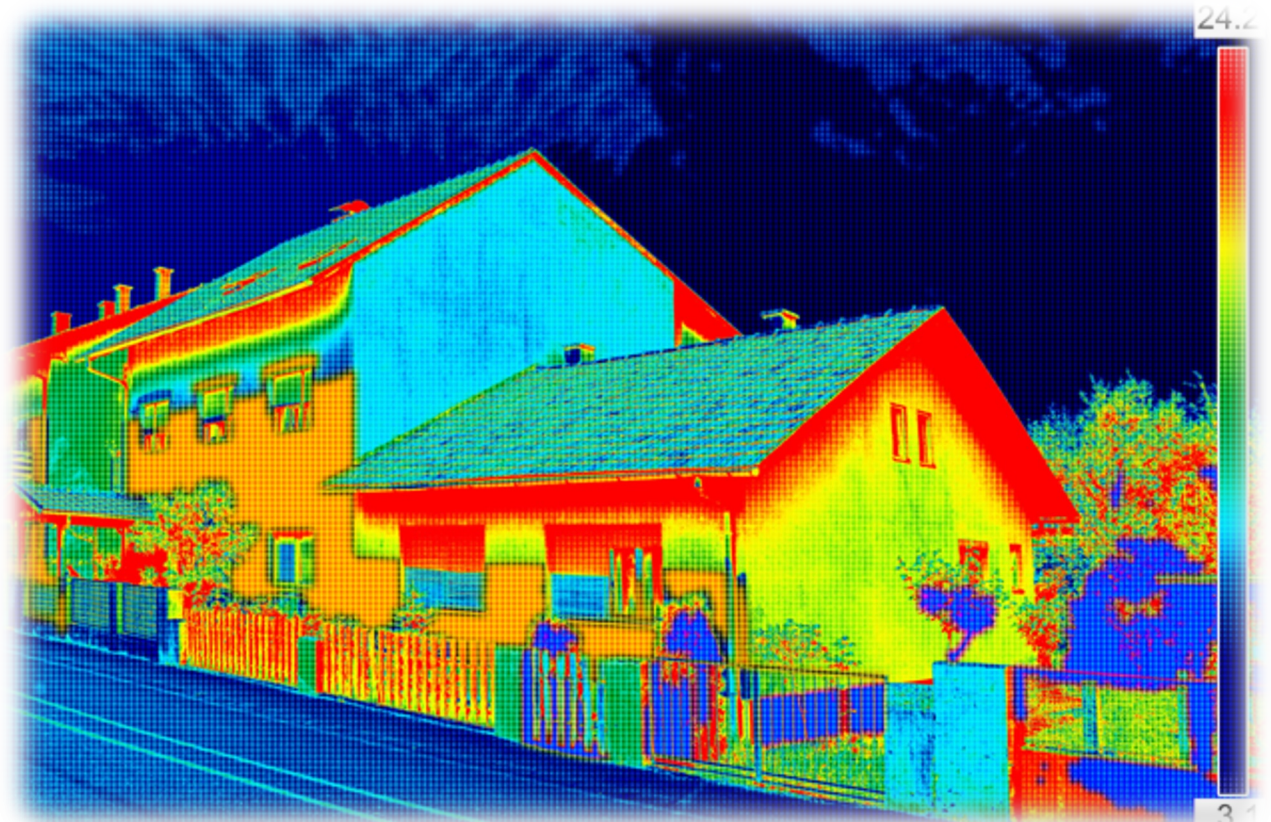
Energy Service Companies (ESCOs) focus on improving the energy efficiency of buildings and facilities through comprehensive energy service solutions by providing:

- **EE leadership**
- **Financial solutions**
- **Performance guarantee**
- **Projects' sustainability**



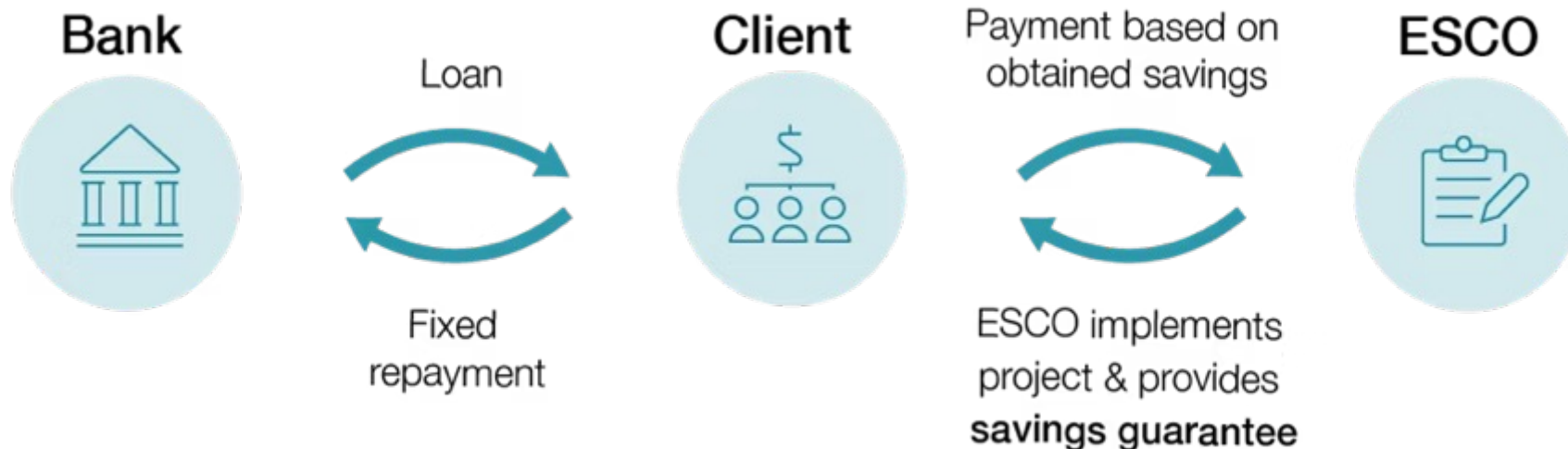
KEY SERVICES

1. Energy audits, feasibility studies
2. Engineering design
3. Project financing
4. Installation and commissioning
5. Measurement and verification
6. Subcontractors' management
7. Project monitoring
8. Operation and maintenance



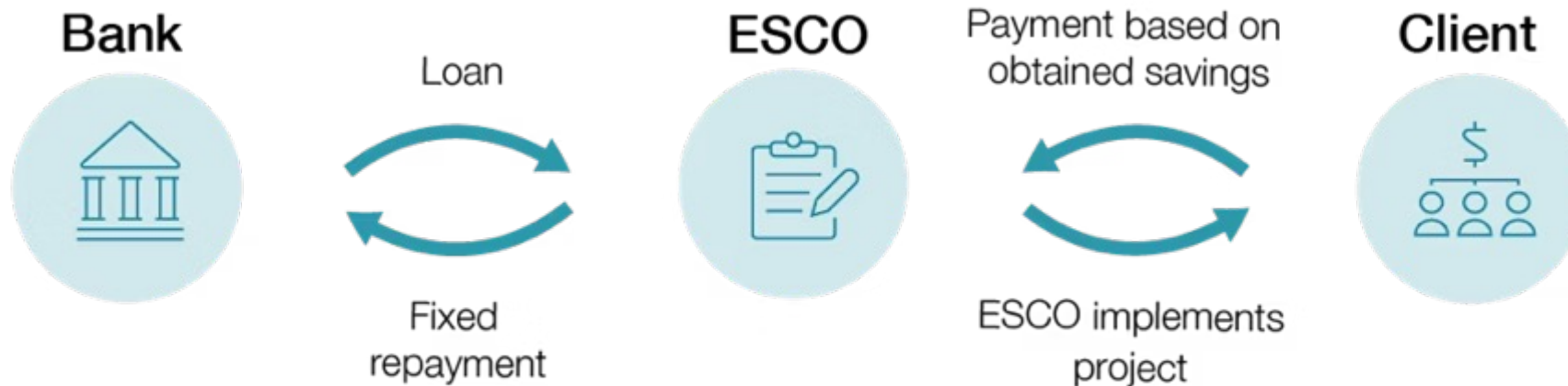
FINANCIAL MODELS USED BY ESCOs (Guaranteed savings model)

Energy Performance Contract Guaranteed Savings model (EPC GS): the ESCO guarantees a certain savings on the client's energy bill. The ESCO takes on the technical risk. The client obtains a bank loan, or uses their own equity, to pay contractually determined fees to the ESCO and the bank and keeps the difference.



FINANCIAL MODELS USED BY ESCOs (Shared savings model)

Energy Performance Contract Shared Savings model (EPC SS): the ESCO can provide financing, as well as project development and implementation costs, with the energy savings shared between the ESCO and the client over the contract period.



FINANCIAL MODELS USED BY ESCOs (SUPER ESCO Model)

Super ESCOs help aggregate projects and drive down transaction costs through standardisation. Project managers must be knowledgeable about the state of the industry, aware of financing options and capable of measurement and verification of energy savings. Super ESCOs provide training.





BARRIERS IN IMPLEMENTATION

LEGAL BARRIERS

1. Lack of ESCO market enabling policy and legal framework
2. Lack of standardized tender documents and contracts
3. No mandatory M&V procedures adopted
4. No methodology for calculation, calibration and adjustment of the baseline energy consumption
5. Lack of enforced energy performance standards for cooling, indoor lighting and domestic hot water (DHW)
6. Noncompliance with sanitary norms
7. Lack of legal expertise regarding performance guarantee for EPC
8. Public debt – on-balance sheet treatment of EPC

FINANCIAL BARRIERS

1. High transaction costs
2. Inadequate risk assessment
3. Difficulties securing collaterals and guarantees for EPCs
4. Lack of capacity and experience in the banking sector dealing with EPCs
5. Difficult access to EPC project financing
6. No trust in performance guarantee provider
7. Limited ESCO borrowing capacity

TECHNICAL BARRIERS

1. Lack of technical understanding which facilities and measures shall be implemented through EPC
2. Lack of experience in similarity, complexity and magnitude of projects
3. Lack of skilled and knowledgeable professionals
4. Inadequate technical risk assessment



RECOMMENDATIONS TO SUSTAINABLE ESCO MARKET DEVELOPMENT

POLITICAL COMMITMENT

- 1. Legal framework adjustment:** Creation of a favourable environment by modifying the existing legal framework to ensure that Energy Performance Contracts (EPCs) are fully operational.
- 2. Awareness promotion and incentive provision:** Active promotion of the ESCO concept among potential beneficiaries, coupled with the offering of financing options and other incentives.
- 3. Mandatory energy efficiency goals:** Establishment of specific, enforceable energy efficiency (EE) goals for authorities at all levels to drive commitment and action.

CAPACITIES OF LOCAL COMPANIES AND INSTITUTIONS

- 1. Local company expertise assessment:** An evaluation of the capability of local companies to adopt the ESCO model.
- 2. Training program development:** Creation of dedicated training programs for engineering and financial companies.
- 3. Service provider certification programs:** Development of certification programs for service providers.

CAPACITIES OF LOCAL FINANCIAL INSTITUTIONS

- 1. Local financial institutions expertise assessment:** An evaluation of the capability of local banks & FI to finance EPCs.
- 2. Training program development:** Creation of dedicated training programs for banks and financial institutions.
- 3. Develop dedicated financing products for EPCs:** Development of dedicated products for EPCs in different sectors and for different target groups of facilities.

ENERGY EFFICIENCY POTENTIAL FOR EPCs

- 1. Energy efficiency potential assessment for target facilities:** An evaluation to determine the energy-saving potential within the target facilities.
- 2. Cost estimation for efficiency measures:** An analysis of the costs associated with implementing the most efficient measures to reduce energy consumption.
- 3. Inventory of building typologies for EPC implementation:** A categorized list of buildings that have the highest potential for Energy Performance Contracting (EPC) implementation.

CASE STUDIES



CASE STUDY #1

VINGÅKER, SWEDEN



Exploring Sweden

Vingåker



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BACKGROUND AND OBJECTIVES OF THE EPC PROJECT IN VINGÅKER

Project background:

- Small municipality with 9,000 inhabitants and a public building stock of 50,000 m².
- Struggled with insufficient maintenance and increasing dependency on ad-hoc external services.

Objectives:

- Implement extensive installation and renovation, including heating system conversion and ventilation improvements.
- Transfer significant risks and responsibilities to the ESCO.
- Enhance the municipality's energy self-sufficiency by transitioning from oil-fired to pellet-fired boilers and installing heat pumps.

RESULTS AND IMPACT OF THE EPC PROJECT

Implementation details:

- Project included major upgrades to 43,500 m² of the initial 50,000 m² due to some buildings being too remote.
- Key improvements: conversion of heating systems, refurbishment of HVAC systems, installation of a building management system, and staff training.

Outcomes:

- Total project cost was approximately €2.6 million, partially funded by a state grant.
- Achieved energy savings of 22%, reducing annual energy consumption from 10 GWh to 8 GWh.
- Financial savings of €220,000 per year, enhanced by rising oil prices.
- Reduced annual CO₂ emissions by 400 tons and sulfur emissions by 0.8 tons.

CASE STUDY #2

BERLIN POLICE DEPARTMENT



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BACKGROUND AND OBJECTIVES OF THE BERLIN POLICE DEPARTMENT, GERMANY

Project background:

- Project Type: EPC Plus, combining energy performance contracting with extensive refurbishment.
- Building Details: Involves 9 estates and 30 buildings used by the Berlin Police Department, totalling 68,000 m².
- Total Investment Required: €6 million for comprehensive refurbishment measures.

Objectives:

- To energetically refurbish buildings incorporating heat insulation to transform into low energy consumption facilities.
- Aim for a substantial reduction in CO₂ emissions through integrated energy-saving measures.

RESULTS AND IMPACT OF THE EPC PROJECT

Implementation details:

- Refurbishment Focus: Includes walls, windows, rooftops, and basement ceilings.
- Financial Strategy: Combines client-funded investments (via special grants and KfW loans) with an Energy Performance Contract.
- Energy and Water Consumption: Detailed evaluations of heat, electricity, and water to establish a performance baseline.

Outcomes:

- Financial Savings: €1 million in direct investment costs expected to be saved through EE.
- Energy Consumption Reduction: Projected heat savings of 55.7% across different building components.
- Duration: A 15-year Energy Saving Contract to guarantee savings and investment recovery.



CONCLUSIONS

FUTURE DIRECTIONS FOR ESCOs

1. **ESCOs** - a key tool for enhancing energy efficiency and fostering a market for energy savings.
2. **However**, ESCOs are **not a “magic carpet”**; alternatives for delivering EE exist.
3. ESCOs are profit-driven entities, they avoid projects with excessive risk or minimal profit.
4. **In Europe**, ESCO markets have seen expansion, but considerable obstacles remain.
5. **Full potential not achieved yet.**
6. **Situation changes** with proactive promotion by public bodies, legislative amendments, financial and technical support from international financial institutions (IFIs) or development finance institutions (DFIs), and rising energy prices.



THANK YOU FOR YOUR ATTENTION!



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