Copenhagen Centre on Energy Efficiency

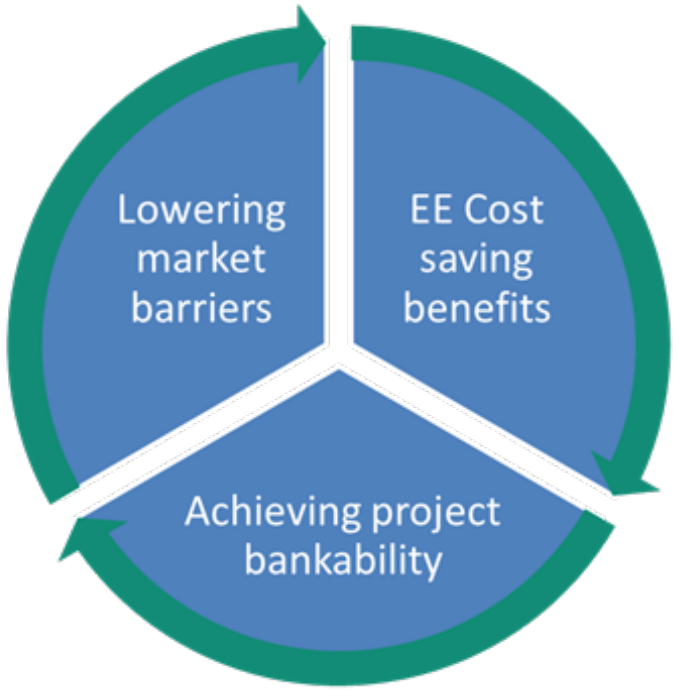
Module 4 – Business models for energy efficiency Project Bundling for municipalities

UNEP DTU PARTNERSHIP | COPENHAGEN CENTRE ON ENERGY EFFICIENCY
SE4ALL EE HUB

Contents

EE project bundling – Main objectives

Aggregating different segments



EE project bundling

Several actors can seek financing together and create common business models to unlock larger investments

The use of economies of scale, which directly helps reduce the transaction cost of the projects

Projects are bundled into a single investment portfolio, financing becomes less risky for potential lenders

ESCO Business model

Energy Service Companies (ESCOs) **provide EE upgrades through energy savings,** retrofitting, risk management and energy infrastructure outsourcing

The goal of ESCOs is **to guarantee EE under a performance-based contract**

ESCOs, as developers, **take care of the project's financing and operational settings, guaranteeing savings at a lower cost**

ESCO Business model

ESCOs allow public building and facilities owners to opt for large capital investment EE upgrades without bearing technical and market risks, lowering financial barriers.

The advantage of using performance-based contracts is that **governments can bundle projects that are outsourced and ESCOS will monitor and verify** energy savings and performance of the buildings or facilities

ESCO - Energy Performance Contracting (EPC)

Energy performance contracting (EPC) is a contracting model that allows ESCOs to become service providers and contractors of EE bundling projects

Under EPCs, the main point is to offer building owners or sponsors guaranteed performance and energy savings through a contract with an ESCO

This means that the project is expected to guarantee energy savings that will help the ESCO repay the project investment costs

ESCO - Shared savings EPC model

Under a **shared savings EPC model**, the ESCO takes care of the financing instruments with financial institutions, which the ESCO uses to finance the client.

The savings are used by the client to pay the ESCO, who will finally repay the loan to the bank.

One of the main advantages of this EPC model is that while energy savings are being achieved, the ESCO receives performance-based income for the project to operate

ESCO - Shared savings EPC model

ESCO - Guaranteed savings model

Under the **guaranteed savings model,** the purpose of the ESCO is to guarantee savings on the end user's energy bill.

In this case**, the ESCO assumes technical risks, but the client obtains financing from equity or debt to pay the contractual fees to the ESCO and the financial institution**

ESCO – Guaranteed savings model

Super ESCO Business model

The **Super ESCO is an entity that the government** creates to function as an ESCO for the public sector specifically

The main point of its creation is to **unlock project financing potential via project aggregation**

Super ESCOs use international and local public funds to **drive EE programmes in public facilities.**

Large-scale implementation and diverse leasing schemes with the public sector are the main strengths Super ESCOs use

Pay as You Save (PAYS) model

When consumers do not have financial resources to give upfront payments or opt for debt**, pay as you save (PAYS) allows them to access cost-effective EE upgrades as they pay for a tariff through their electricity bills.**

This modality **removes high debt and cost barriers while monthly energy savings are directly tied** to the long-term sustainability of this business model

For low-income consumers and remote access residential areas, PAYS has been proven to improve EE step by step **without the need for creditworthiness**

Since PAYS financing relies on an adequate meter and the completion of the occupancy periods of the buildings under contract, **consumers increasingly participate as part of bundling projects to lower these uncertainties**

PAYS financing model

UNEP DTU PARTNERSHIP | COPENHAGEN CENTRE ON ENERGY EFFICIENCY
SE4ALL EE HUB

EE Bundling models in municipalities – main barriers

Main barriers		
Market	Financial	Technical
Market organization and price distortion	Limited borrowing capacity	Limited municipal capacities
High transaction costs	Limited creditworthiness	Limited familiarity with EE technologies
Energy prices below costs of supply	High up-front costs	Lack of affordable EE technologies for specific local conditions
Uncertain regulatory framework	Perception of high risk and high transaction costs	Lack of capacity to maintain EE investments
	Perception of high risk and high transaction costs	

Main barriers per business model

Main barriers per bundling business model		
Traditional ESCO model	Super ESCO model	Pay as you Save (PAYS)
Lack of EE knowledge of potential clients	Limited to government availability	Limited familiarity with EE technologies
Unpredictable energy saving benefits for certain projects	Need for large group of projects to aggregate	Lack of access to information
Limited financing access for remote and low-income municipalities	Financing access depends on incentives and policies	Lack of affordable EE technologies for specific local conditions

Main opportunities for EE bundling models

- The combination of innovative financing mechanisms and aggregated investments allow stronger cooperation schemes that lead to higher economic benefits for the bundle

- In the case of buildings, there are diverse possibilities of integration of innovative technologies for heating, cooling, lighting, devices and other EE upgrades

- For instance, municipal financial guarantees can leverage, from multilateral financial institutions, instruments to incentivize EPC contracts as bundled projects that simplify the cost-effectiveness for building owners

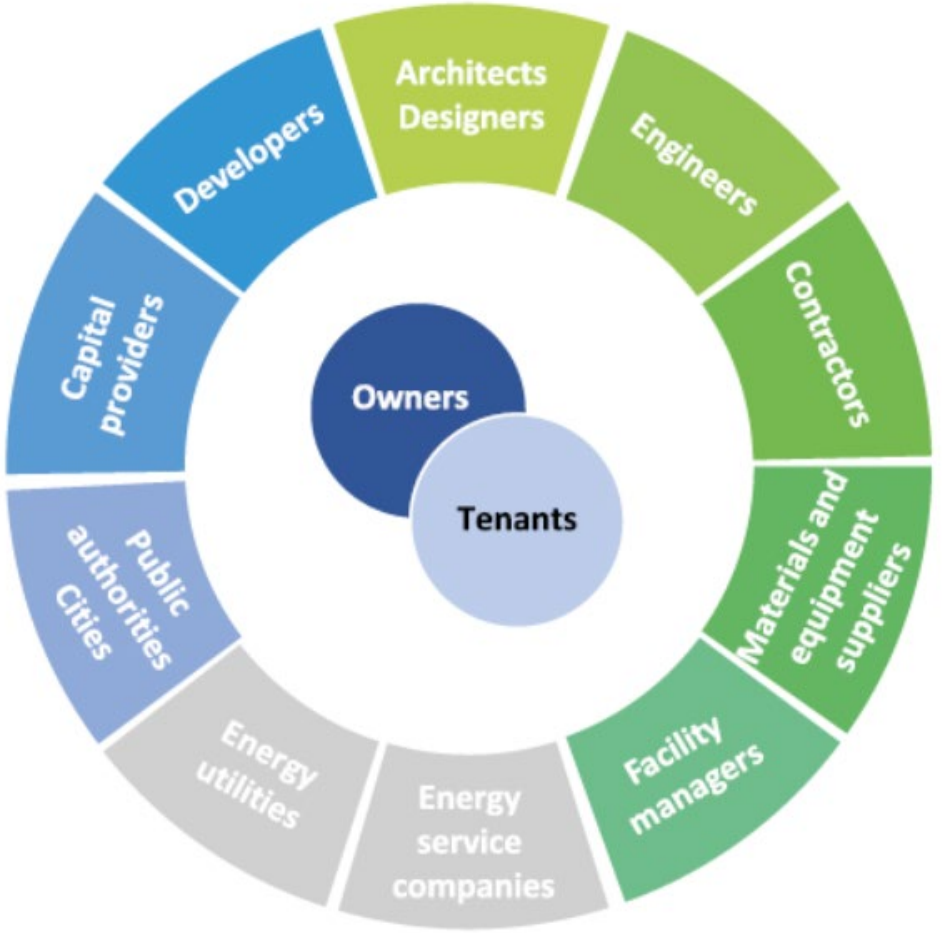
- With regard to public lighting, there are increasingly efficient opportunities for cities through the use of LED technologies, which have proven to save as much as 70 per cent of energy

Public lighting EE bundling – the case of Brazil

In the case of Brazil, given the lack of financial and debt capacities of municipalities, the solution was **to aggregate municipalities as a consortium that managed the financing process via an SPV.** Using the **ESCO model, municipalities could upgrade their lighting and make the repayments, counting on a technical performance guarantee.** Financiers were able to provide capital expenditure at a competitive rate for the consortium and **the ESCO took care of the management process, as well as the operation and maintenance.**

This has led **13 Brazilian cities to use the business model as "payment for the use of the asset",** making the replacement of lighting more cost-efficient without bearing risks municipalities were not ready to undertake. The constant evolution of this model into a **public-private partnership that delimits the tasks each of the players are bound to deliver has led to rapid public LED** lighting modernization in several Brazilian cities.

Business models for public building deep renovation



UNEP DTU PARTNERSHIP | COPENHAGEN CENTRE ON ENERGY EFFICIENCY
SE4ALL EE HUB

One-stop shop model

- These business models **use networks, clusters, PPPs and innovative technologies** to solve EE issues in buildings via a holistic approach
- They **integrate the building owner and define optimal measures and interventions for the renovation project**, focused on multi-family buildings, especially social housing.
- Many of these projects use **modern digital technologies for energy-saving measures to be applied in smart manners**, depending on the solution that is more adequate to each building.
- For instance, **one-stop-shops are being used by PPPs via EPCs to allow renovations to focus on EE solutions**, according to the most updated efficiency standards.

Innovative financing schemes

- innovative financing schemes are linked to business models, such as on-bill financing, PAYS, energy savings obligations and other solutions **that include crowdfunding and home-based financing**
- This means **that participatory investments that promote greener spaces and renovations are gaining momentum** in many public-private interventions
- For instance, refurbishing packages have brought large multi-property buildings, **such as the case of Laguna de Duero, in Spain**
- In this intervention, the renovation was carried out by a private company and its subcontractor, **which was linked to a loan with Triodos Bank. The private company was refunded through a long-term contract with the owners community** and the district heating connection was financed by a sustainable long-term scheme

Laguna del Duero, Spain – Example

- Retrofitting of 31 residential and multifamiliar buildings from the 70s and 80s.
- Main technology improved: more efficient district heating system
- **Main challenge: Buildings were privately owned with multiple owners, at least 60% of their approval is needed**
- **Incentives:** 50% of the investment was funded by the EU
- **Innovative EE solution:** Organizing owner communities that charge utility expenses to the building owners, through group aggregated rental monthly fees
- **Financing:** Loan by Triodos Bank with EE saving and GHG emission reduction strict conditions

New revenue business models

- The innovation of renovation schemes has widened to **new revenue models that combine elements of climate policies** and in-house value-added business model ideas
- For instance, **profiting from rent increases, feed-in schemes of remuneration, green building** label certificates and others
- For instance**, feed-in schemes allow the energy producer to receive payments per unit of renewable energy produced**, which is similar to climate policies
- The case of **green building label certificates has evolved into guarantees** of building performance that allow premium prices for the certified property to be agreed on a later stage, according to green standards