

EmpowerClimate

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WS 1. Financing energy and climate actions in municipalities

This project is part of the European Climate Initiative (EUKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

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Aim and Outline

- ✓ Assist local governments with a catalogue of alternative options of financing energy efficient, low carbon, and climate resilience updates of their infrastructure

Self-financing

- Budget allocation
- Revolving funds, incl.
- Internal contracting
- External revolving funds

Debt-financing

- Concessional loans
- Commercial loans
- Municipal green bonds

Financing by a private contractor

- Simple contracting model
- Contracting with forfeiting and waiver of defense

Financing by a private contractor through energy savings (energy performance contracting - EPC)

- Guaranteed savings model
- Shared savings model
- Other EPC models

Public private partnerships (PPPs)

- Leasing from a private contractor
- Concession to a private partner
- Project finance using special purpose vehicles (SPV)
- Corporate green bonds
- Land value capture

Financing by citizens

- Crowdfunding

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Self-financing:

Revolving funds



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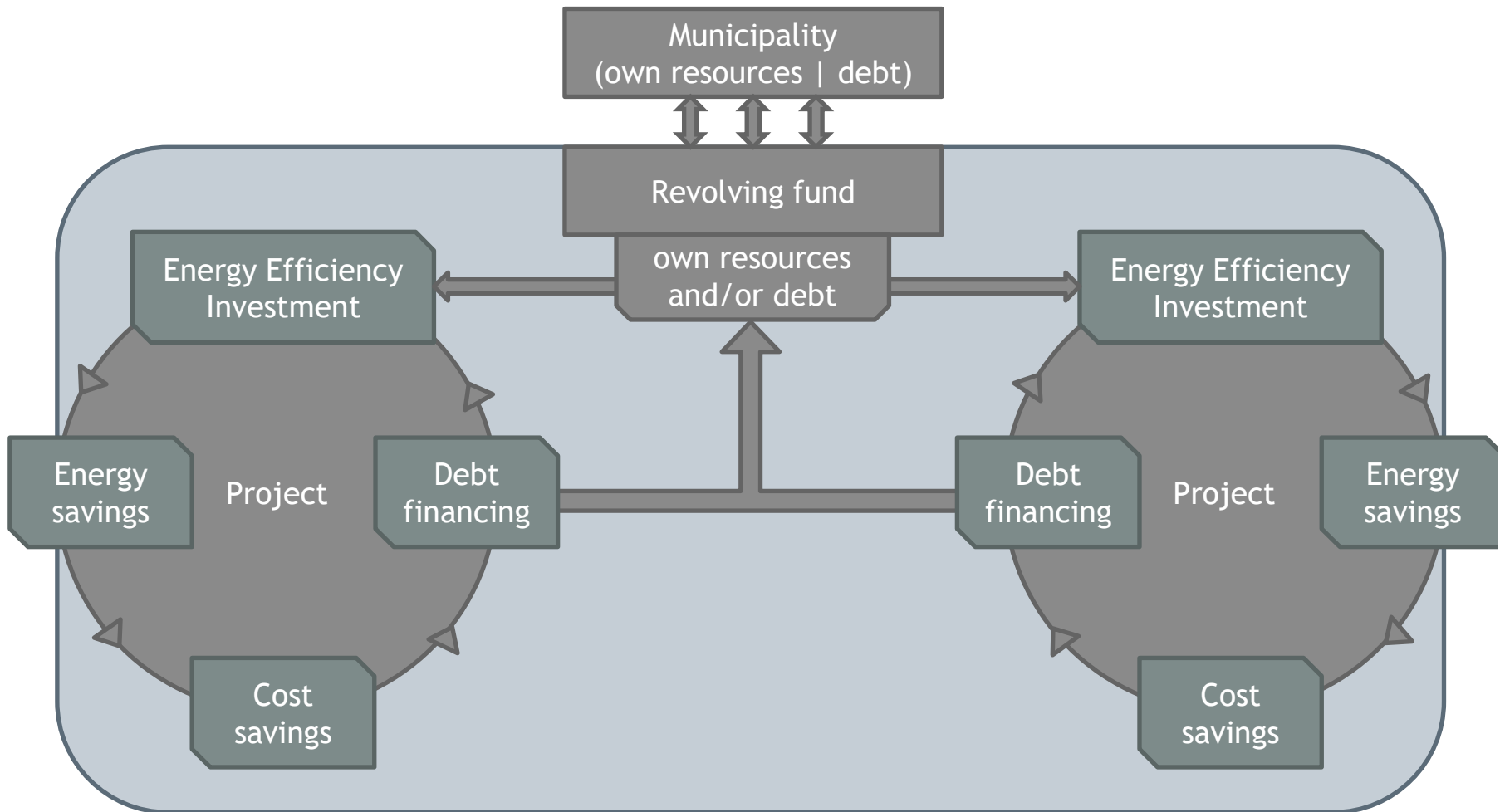
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Financing using revolving funds



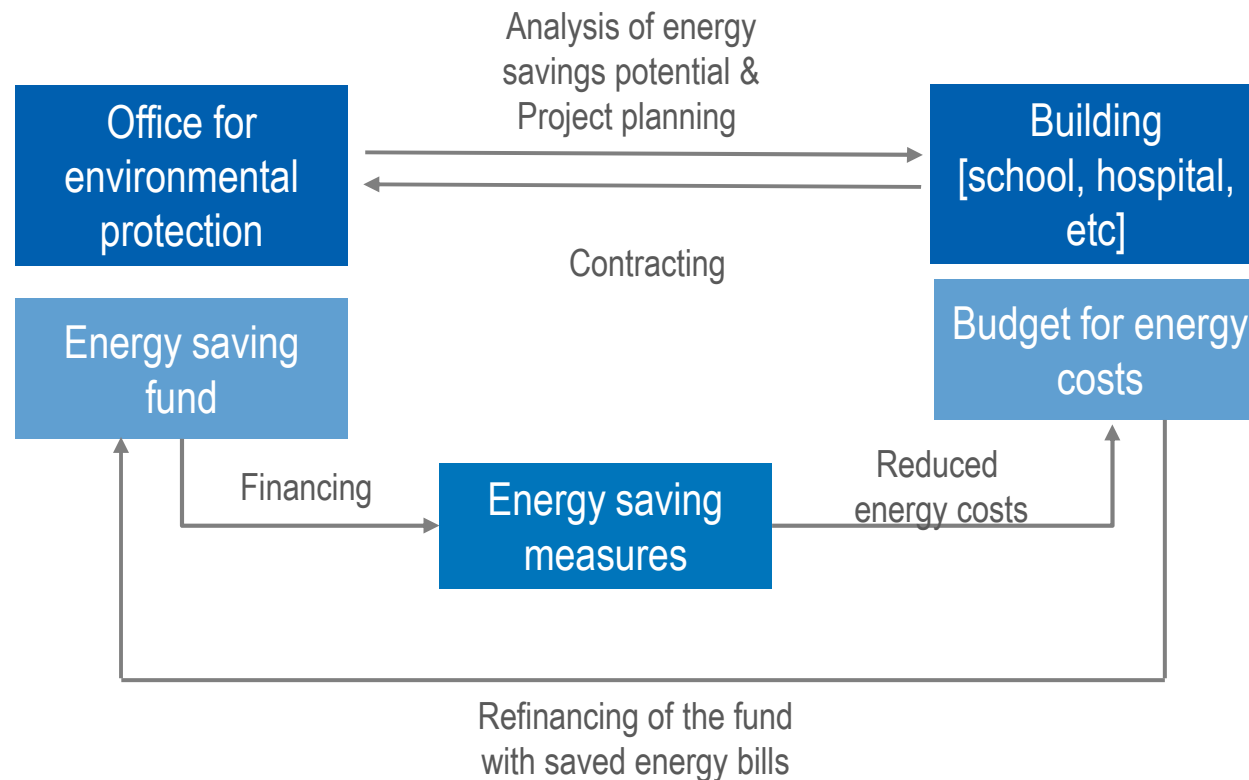
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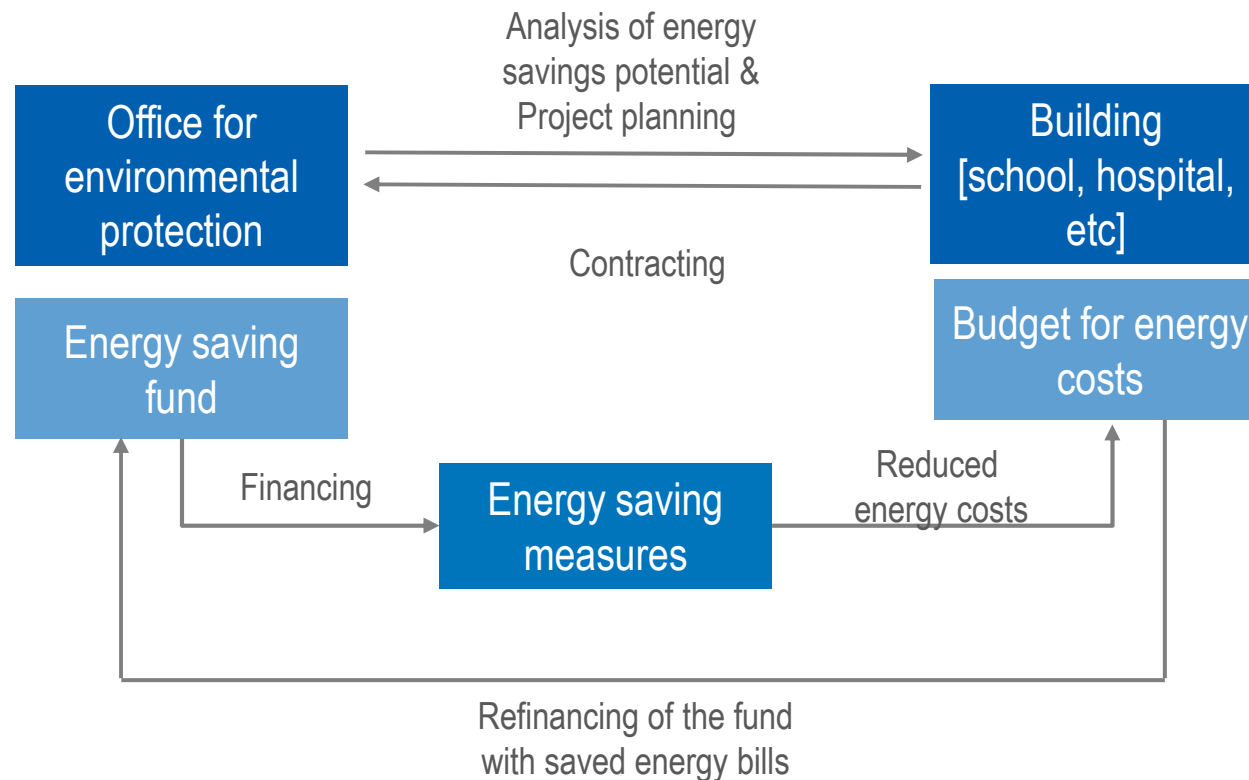
Internal contracting: Stuttgart

- Internal organisational units act as contracting partners
- Energy savings from funded projects are redirected to the fund



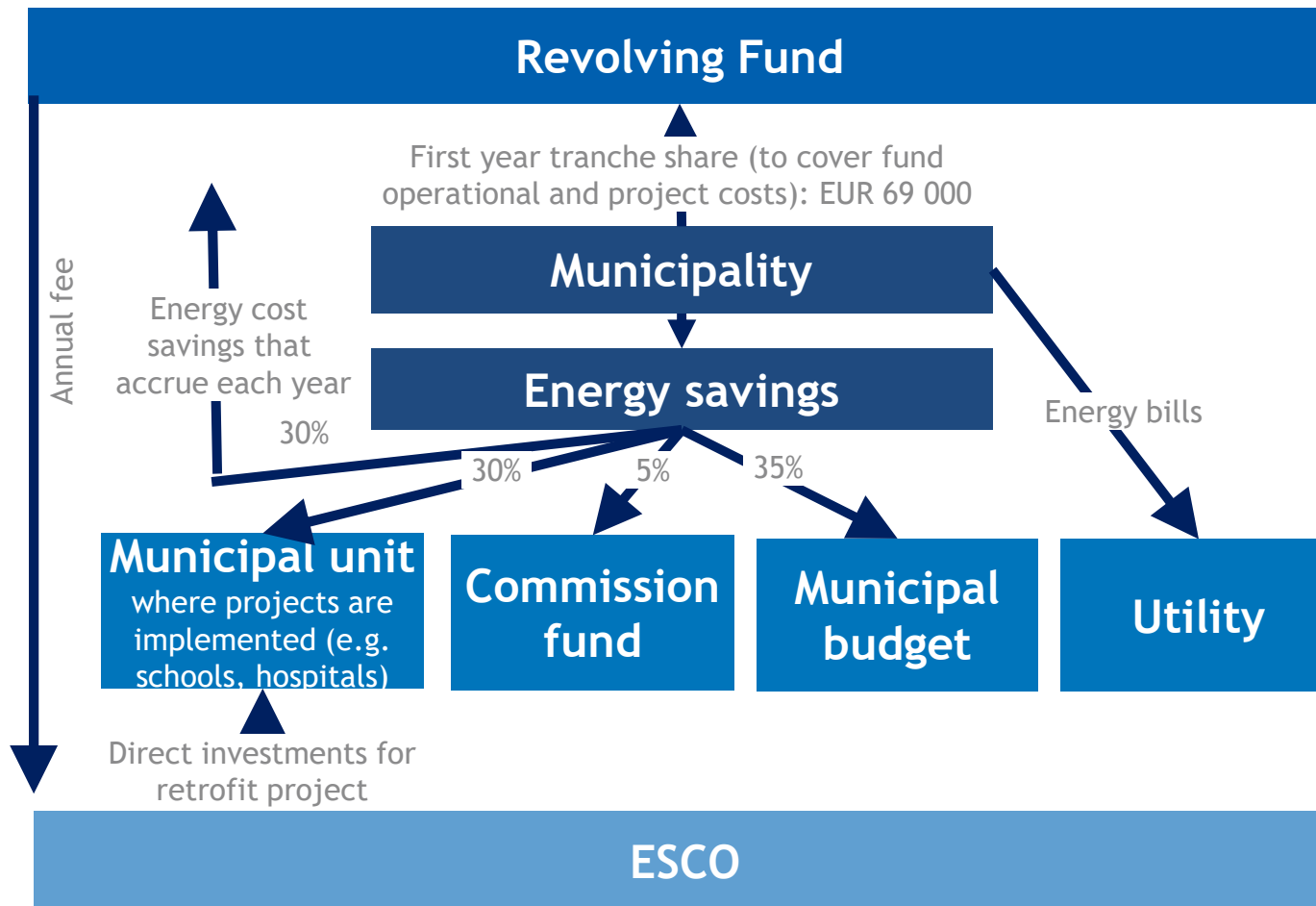
Internal contracting: Stuttgart

- Internal organisational units act as contracting partners
- Energy savings from funded projects are redirected to the fund



Internal contracting: Litomerice, CZ (2014 – ...)

- Municipality initiated a fund, provided capital and manages the fund
- Fund provides financial instruments to external service providers



Internal contracting (intracting)

Architecture

- Internal organisational units act as contracting partners
- Municipal establishes a fund or trust from own funds
- Fund/ trust finances projects without interest rate or additional costs

Other features

Projects financed by this model:

- Municipal infrastructure projects, e.g. buildings or street lightning

Jurisdictions that applied this model:

- Conceptualized in Germany, now started throughout EU (France, Italy, Croatia..)

Advantages

Municipalities:

- can reuse capital
- do not need external capital
- cooperate within their units
- pay no interests on capital

Disadvantages

Municipalities:

- carry fully up-front cost
- bear all project risks
- may face lower project efficiency vs when the upgrade is delivered by private actors

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Financing by a private contractor: *Contract with forfeiting & waiver of defence*



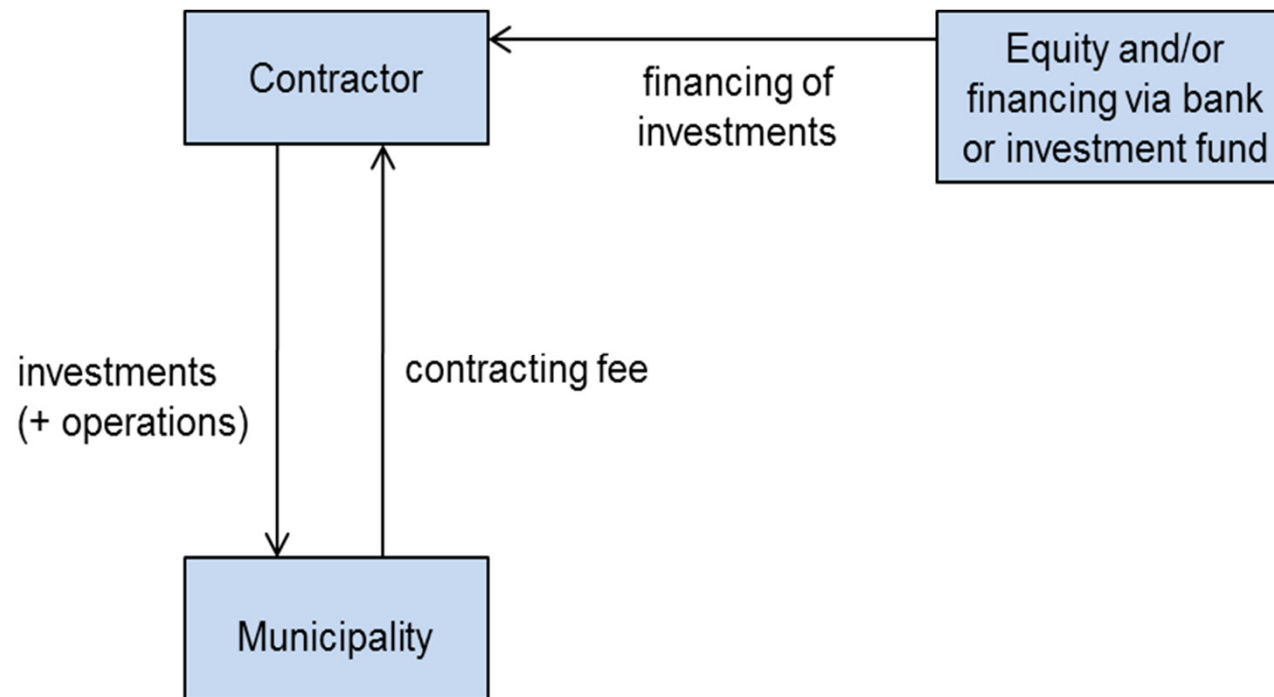
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Simple contracting model

- Contractors responsibilities include planning, financing and executing investment
- Contracting fee covers costs for above responsibilities and include a margin



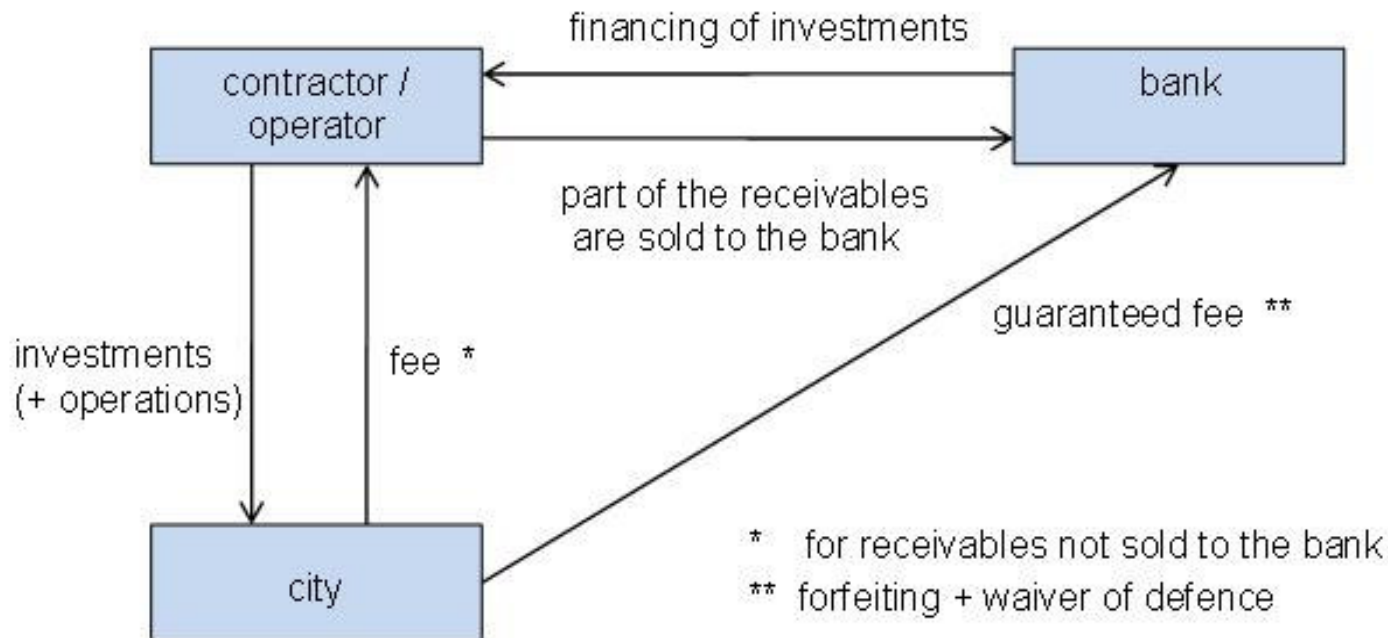
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Contract with forfeiting & waiver of defence

- Similar to the simple model, but a bank enters agreements with both parties
- Part of the contractors fee are paid to the bank for financing equipment
- The city guarantees the margin to the bank, even if there are no savings The risk is solely with the contractor



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Case study – Dillenburg, DE (2012 - ...)

Project overview

- Dillenburg tendered the upgrade of its street lighting over a 12 year period
- The decision was based on cost reduction incl. contracting fee and energy costs

Project scope

- Energy efficient modernization of 2,450 luminaries

Financing structure

- 70% of the contractors receivables are paid to a bank, which received also a guarantee from the city for 12 years
- The contractor guaranteed 50% energy savings, if higher, the contractor receives a part of it

Implementation & outcome

- Replacement of the old luminaries took place in less than 3 months
- Savings are higher than guaranteed, making the project more profitable for the contractor an the municipal

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Debt-financing:

Municipal green bonds



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Municipal green bonds

Architecture

- Municipal bonds are issued by the local government or their agencies
- Bonds can be certified as *green bonds* by an independent institution

Other features

Projects that can be financed by this model:

- Any project, if the municipal has access to a bond agency

Jurisdictions that applied this model:

- Gothenburg (SWE) & Varna (BGR)
- Not common in Europe

Advantages

Municipalities:

- Can issue bonds autonomously or in cooperation with bond agency
- Get low interest rates compared to commercial bonds or loans

Disadvantages

Municipalities:

- Need to prepare extensively and costly
- Need a good credit rating, if acting autonomously

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Gothenburg's Green Bonds (2013-...)

Project overview

- Gothenburg implemented its Green Bond Program in 2013
- Raises capital for climate change and environmental projects

Project scope

- Eligible projects include: mitigation, adaptation/ resilience and environment
- Projects are selected by the city office and approved by the city executive board

Financing structure

- Bonds are issued on the capital market, any mainstream investor can buy them
- 1st bond issued accounted for 56 mEUR
- Total capital raised 0.46 bEUR in 2016

Implementation & outcome

- Gothenburg was the first city to issue green bonds
- Since 2013, 11 projects have been funded

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Public private partnerships: *Green bonds*



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Corporate green bonds

Architecture

- Another PPPs used to finance green projects

Other features

Projects financed by this model:

- Suitable for any municipality that can stimulate and motivate private institutes to issue green bonds

Jurisdictions that applied this model:

- Sweden, Denmark, Norway, Finland

Advantages

Companies:

- Provides capital for sustainability-related projects

For investors:

- Allow to invest in sustainable products and initiatives without taking additional risk

Disadvantages

Construction risk:

- cost overruns, longer construction time, failure of project etc.

Placement risk:

- Final price of project bonds is only determined at issuance, results in pricing uncertainty during the financing process

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Vasakronan's green bonds (Sweden)

Project overview

- Sweden's largest property company
- World's first corporate green bond issuer and remains the largest corporate green bond issuer in Sweden with 5.2 bn SEK in green bonds

Financing structure

- Undertaking initiatives to promote greater environmental responsibility and encouraging the development and diffusion of environmentally friendly technologies, which provides a framework for the company's green financing program

Project scope

- Green bonds issued under Vasakronan's EMTN programme and the documentation corresponds with Vasakronan's other EMTN bonds
- The proceeds from green bonds are used solely for investments encompassed by Vasakronan's Green Bond Framework

Implementation & outcome

- The company elaborated a sustainability program with specific targets
- As a result they reduced energy use by 30% and carbon emissions by 97% between 2006 and 2013

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Public private partnerships:

Land-value capture



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Land-value capture

Architecture

- Allows municipality to tap into increasing land value to ensure that some of the value generated by public sector investments, which private sector can benefit from, is reinvested into the community

Other features

Projects financed by this model:

- More commonly used in developed cities, but also suitable for developing cities

Jurisdictions that applied this model:

- Orange County Florida, State of Pennsylvania, Hamburg, Freiburg (GER)

Advantages

Municipalities:

- Helps economic growth to be achieved in sustainable way
- Builds more competitive region and higher quality of life
- Reduces costs of living

Disadvantages

Municipalities are confronted with:

- Required a thorough understanding of complex factors at play, including maturity of land markets or land use regulations
- Potential for revenue stream volatility

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Hamburg's Hafen City (2007-2025)

Project overview

- Largest urban development zone in Europe
- Public authority acting as a developer
- HafenCity Hamburg was a state-owned company established to oversee all activities related to the newly designated urban development zone

Project scope

- The total public expenditures of 3bn EUR was subsequently complemented by private investment totaling 10 bn EUR
- Stakeholders: Haburg HafenCity GmbH, City-state, private land developers

Financing structure

- Infrastructure financed by borrowing against the land assests, which included building roads, bridges, public spaces etc.
- The sales of land often took place through a bidding process to ensure high-quality and diversity within the

Implementation & outcome

- HafenCity GmbH suggested that almost all of the public money invested in the project have been recouped through the sale of individual sites to private land developers
- Despite the size successfully integrated within the city centre

plan



Financing by citizens:

Growdfunding



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Crowdfunding

Architecture

- Crowdfunding means raising funding online on platforms where investors and project developers meet
- Investors can freely pledge their money to projects they like to support
- Different models are possible, including lending-based or reward-based

Other features

Projects financed by this model:

- Any project can be crowdfunded as long as it can raise enough attractiveness and hence funding

Jurisdictions that applied this model:

- Crowdfunding grows fast in the UK, France and Germany

Advantages

Municipalities:

- Attract more investors via crowdfunding
- Build a community around their project
- Freely decide on what return investors should get
- Split their finance in regular ways of funding and crowdfunding

Disadvantages

Municipalities:

- Need to attract enough investors to fulfill their funding goal
- May suffer issues of responsibility to a vast amount of small investors
- Have no guarantee that investors stick to a project throughout the funding phase

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Bettervest platform

<https://www.bettervest.com/en/funded-projects/>

Project overview

- A Germany-based crowdfunding platform for GHG mitigation projects
- Project sizes vary from 5,000 EUR to 600,000 EUR
- People are free to invest from 50 EUR upwards to EUR 25 000

Financing structure

- The rounded total funding amount is divided into measure investment costs, the listing fees for the bettervest platform (10% of the funding amount when the funding volume is fully achieved) and the trustee fee (0.75% of this funding amount).

Implementation

- A public school in Wilhelmstadt Gymnasium Berlin raised 418.050 EUR for energy efficiency upgrades from
- 465 investors
- The school has to payback the investments of the crowd within 8 years with a 6% interest rate



Finanziert

Nahwärmenetz mit zwei BHKWs und modernisierten Heizkesseln für das Wilhelmstadt Gymnasium in Berlin

621.08 t CO₂ Einsparung
8 Jahre Laufzeit | 6,00 % Rendite p.a.

418.050 €

Zum Projekt

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GOOD LUCK!



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Financing by private partner through energy savings

Guaranteed energy savings



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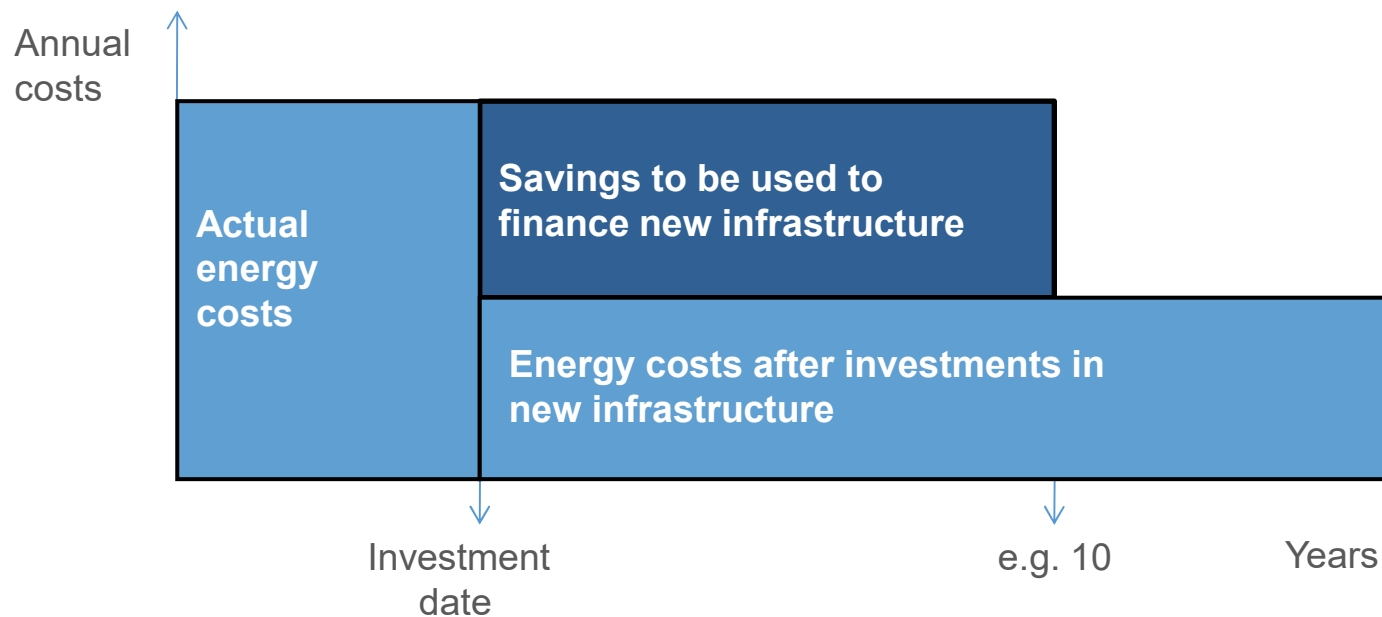


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EPC with guaranteed savings

- A contractor designs and implements a project with a savings target
- If energy savings are below the target, the contractor covers the shortfall, while higher savings fully benefit the municipality
- The municipality pays a fixed fee to the contractor during the period



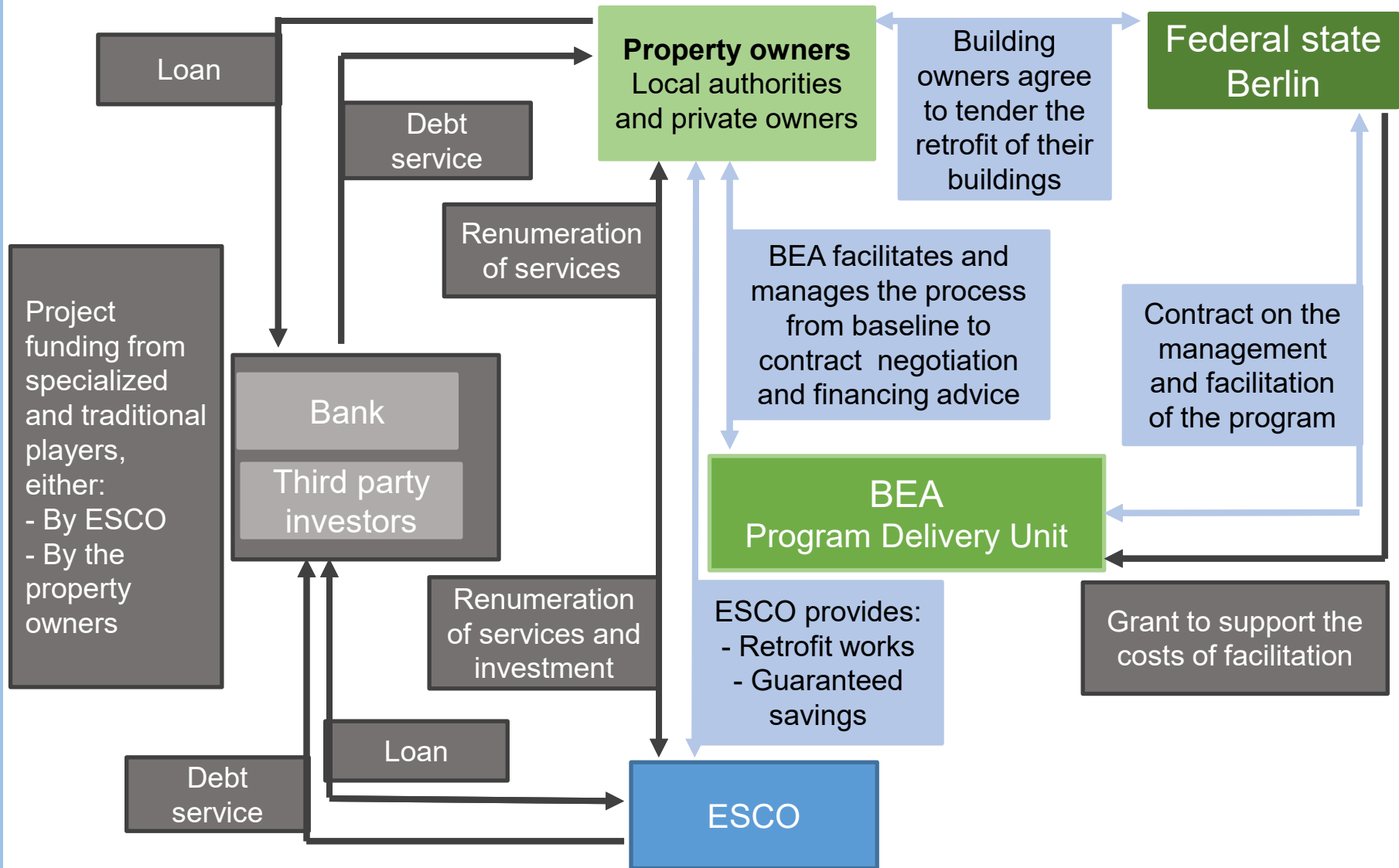
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Berlin Energy Saving Partnership: EPC guaranteed savings

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Financing by private partner through energy savings

Shared energy savings



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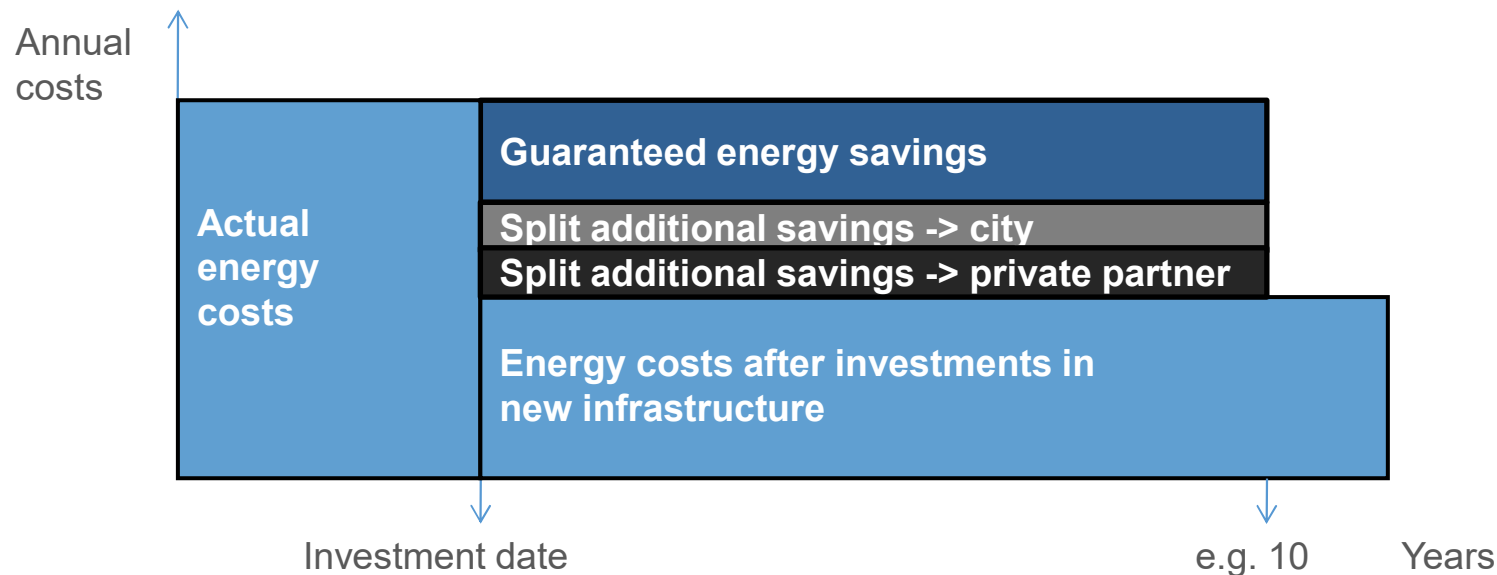


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EPC with shared savings

- A contractor designs and implements the project, with a savings target and receives a fixed premium from the municipality
- If energy savings are below the target, the contractor covers the shortfall
- Higher savings result either in a €/MWh bonus or in sharing the savings



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EPC shared savings in Nauen (2011-2016)

Project overview

- The city of Nauen, Germany, tendered a 5 year contract for operation of its street light infrastructure
- Targets set were a luminary replacement and energy savings of 40%

Financing structure

- The project enabled to invest in more infrastructure over the project period
- The payments made by the municipality were compensated by achieved energy savings

Project scope

- 2,350 luminaries should be upgraded over five years
- A savings split 50/50 between municipal and private contract partner

Implementation & outcome

- Savings were slightly higher than estimated in the tender
- Therefore both the contractor and the municipal benefitted slightly more than estimated



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