SWARCO V.S.M. GMBH

Verkehrstechnik – Service – Montage – Beleuchtung

(Traffic and Lighting Technology – Installation – Service – Management)

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Models for financing and operating an energy efficient lighting infrastructure

Why invest in energy efficient lighting?

utilising lighting with maximum energy efficiency makes sense in both cases

- installing a completely new infrastructure

  → maximum savings due to optimised positioning of poles

- modernising an existing infrastructure

  → still significant energy savings (up to 80%) due to modern lighting technology (→ LED) and control systems

result: savings → money, CO_2

quality improvements

When to invest in energy efficient lighting ?

pessimistic view:

it's never the right time, because technology continues to be developed further and to be available at lower prices

realistic view:

today's street lighting technology – including LED – has reached

- a highly developed status
- with most of the price reductions already having taken place

→ the right time to invest is now!

In which technology to invest?

technology with high energy efficiency usually is more expensive

→ but only in its initial investment!

→ operating costs are significantly lower

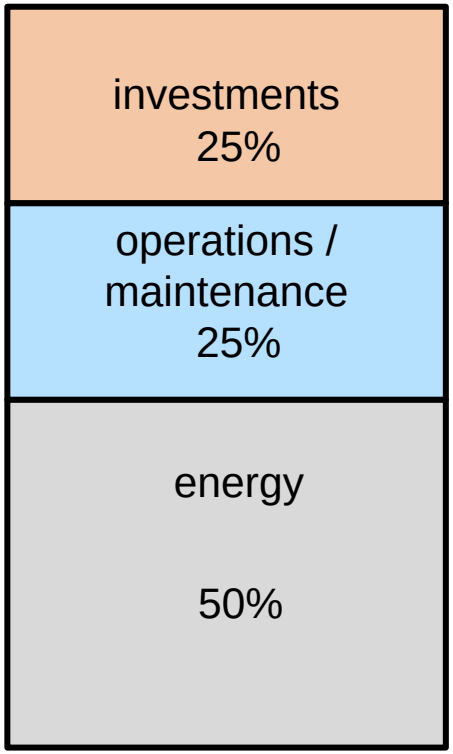
→ amortisation is usually achievable in few years up to a maximum of 10 years

→ highly efficient lighting technology – particularly LED-lighting – has other advantages (several quality criteria) too

Typical street lighting scenario

- old infrastructure
- urgent need for quality improvements
- legal requirements for energy efficiency (⟶ ErP directive of the EU)
- increasing awareness of environmentally friendly solutions (⟶ climate protection)
- increasing energy prices and high share of energy in total costs
- benchmarking and best-practice solutions – often involving specialised private partners – reveal the high potential for cost reduction

Typical cost elements



Consequence of this scenario

→ pressure to modernise an existing street lighting infrastructure or to install a new one with high energy efficiency and to reduce the costs of operation is greater than ever before

but: financial ressources for investments are limited

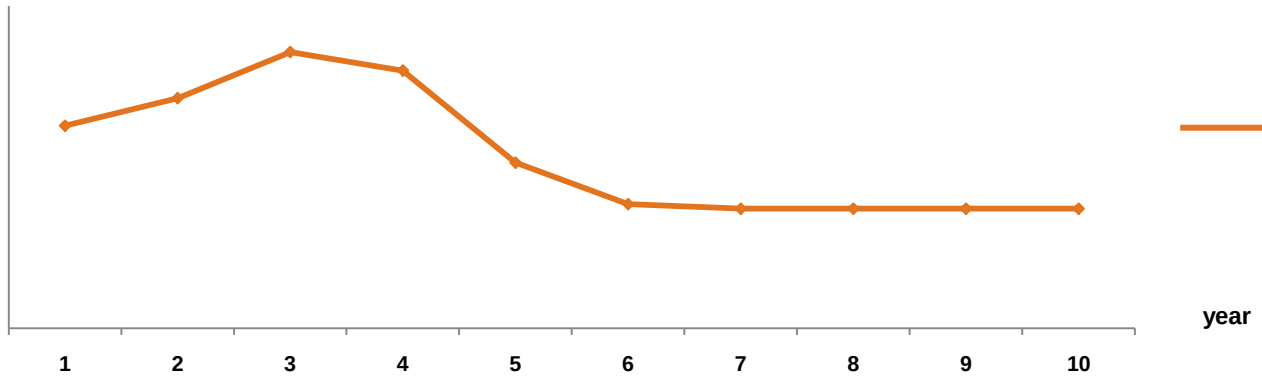
→ urgent need for solutions

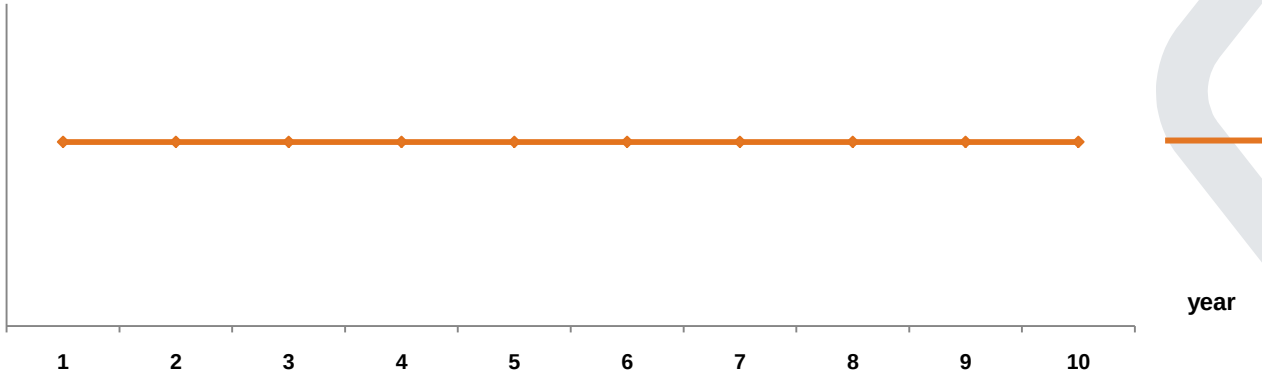
The role of private partners

Most solutions involve private partners in different roles:

- consulting → specific know how to analyse the status, the potential for improvements, to find the optimum technology, the optimum financing and operational concept as well as sources for funding
- bidders in tenders → competition
- suppliers of technology
- operators (including or not including the financing)
- financing partners

Levelling of expenditures as one important objective





Classification of private participation

- financing without running the operations

  → limited utilisation of optimisation potential

- running operations without financing of investments

  → no solution for the city's budget constraints

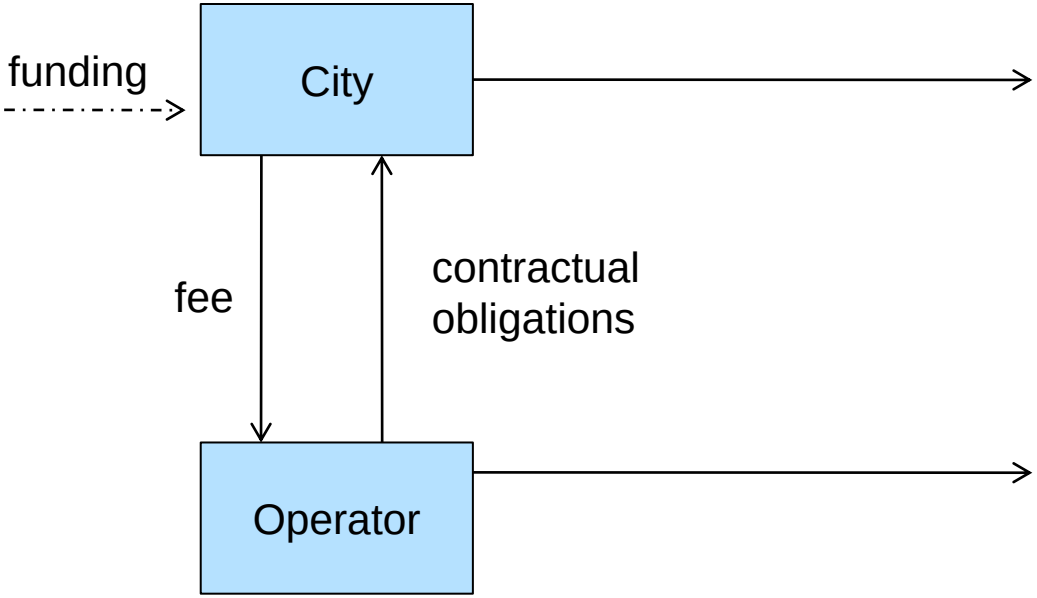
- combination of both

  → outsourcing of operations including financing

  → private partner receives fee for
  - operations + maintenance
  - capital costs for financing
  - optionally: energy

  → fee includes a profit, but is much lower than expenditures by the city in the past

Management model involving a private partner



- owner of infrastructure
- strategic guidelines
- controlling

- operations + maintenance
- investments in modernisation + new installations
- financing (optionally involving a bank)
- optionally: energy supply

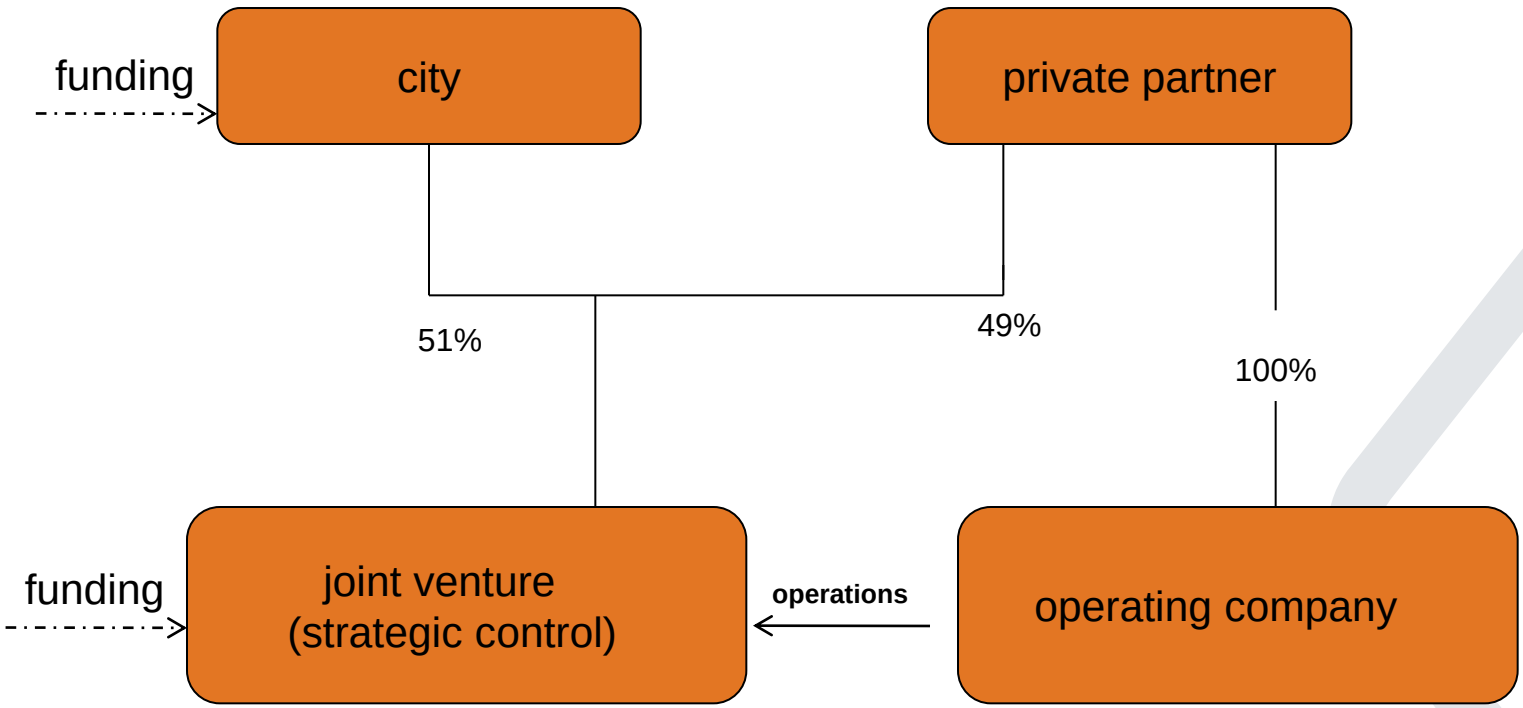
Management models are highly flexible

flexibility exists concerning

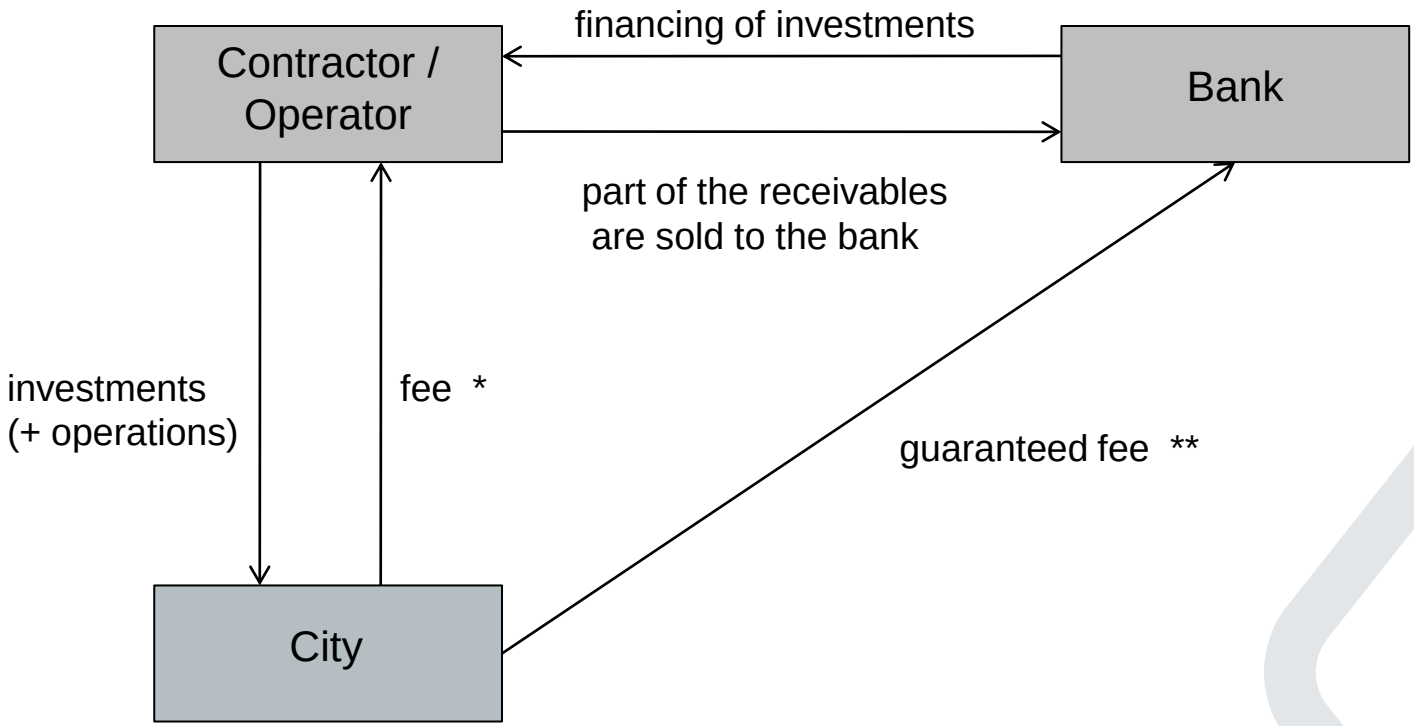
- contract duration
- range of services
- guarantee of energy efficiency gains
- involvement of local jobs and enterprises
- regional expansion
- responsibility for acquiring funds
- degree of participation in strategic decisions

standardisation might miss individual requirements, which are important for a city

Cooperation model



Contracting model (simplified)



* for receivables not sold to the bank

** forfeiting + waiver of defence

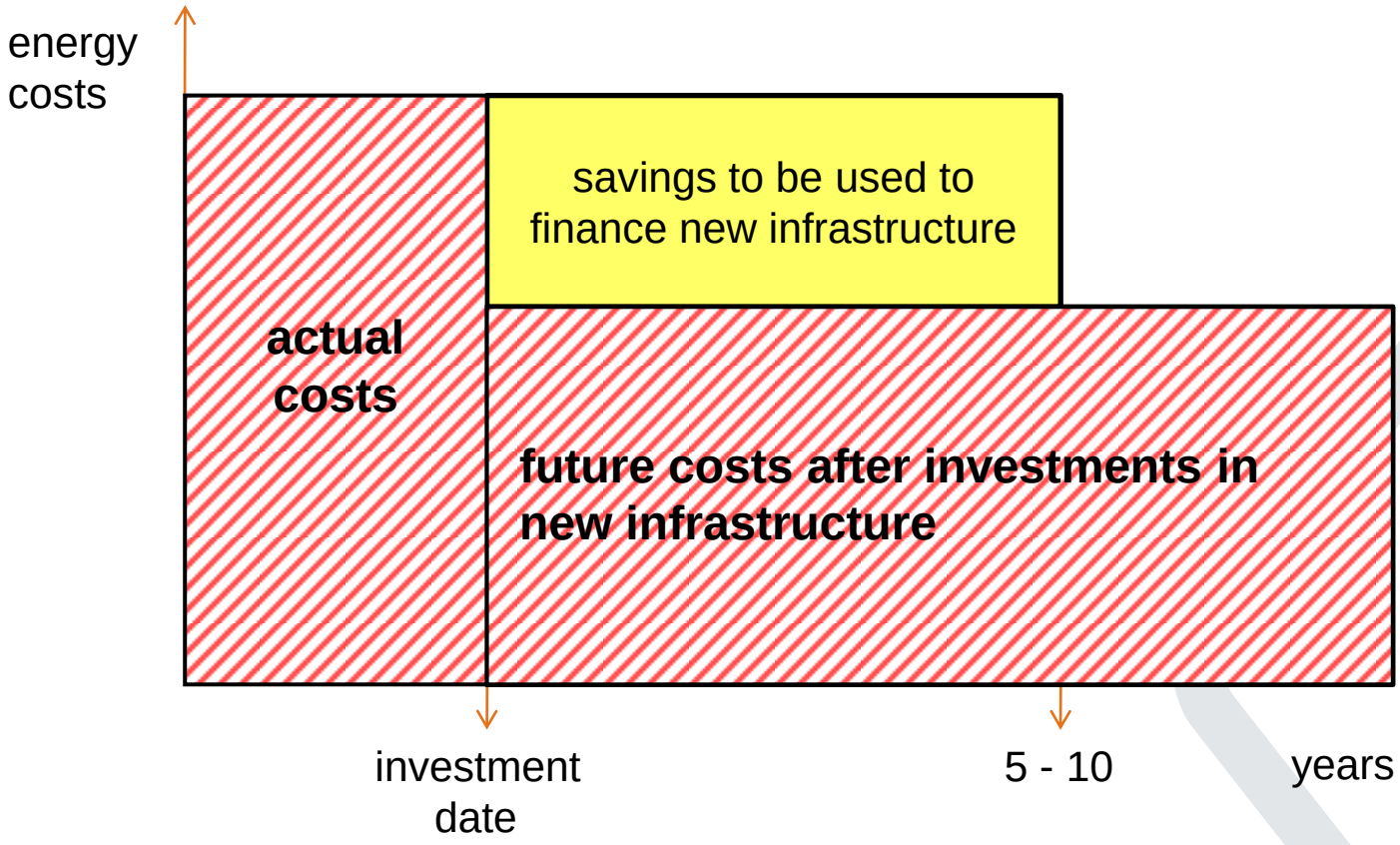
Characteristics of contracting and hire-purchase agreements

- investor (contractor) finances, operates and owns infrastructure
- at the end of the contract, ownership **can be** transferred (“contracting”) or **has to be** transferred (“hire-purchase agreement”) to the city
- contract duration depends on amortisation period of investments
- usually banks are involved, receiving part of the city’s payments directly (guaranteed fee)

Characteristics of contracting and hire-purchase agreements

- all models can include operations
- optionally, they can be restricted to financing
- typically, they focus on a defined part of the lighting infrastructure, e.g. new LED street lighting in defined streets or districts
- management models, by comparison, typically cover the entire lighting infrastructure of a city

Contracting financed by energy savings



Financing via energy savings

- if contracting focuses on savings in energy consumption, then these savings can be used to finance the fee paid to the contractor

- result: city receives a modernised, energy efficient infrastructure without having to increase its spending

Conclusions

- future demand for modernisation of existing street lighting infrastructure and for the installation of energy efficient technology leads to huge investment needs

- flexible models exist and often have been realised, which enable these investments to be carried out, despite severe public budget constraints

- models involve private partners, leading to
  - the utilisation of specific know how and experience
  - cost efficient operations
  - pre-financing of investments, thus levelling public expenditures