

# ESCO models in Germany and Europe

Konstanze Stein

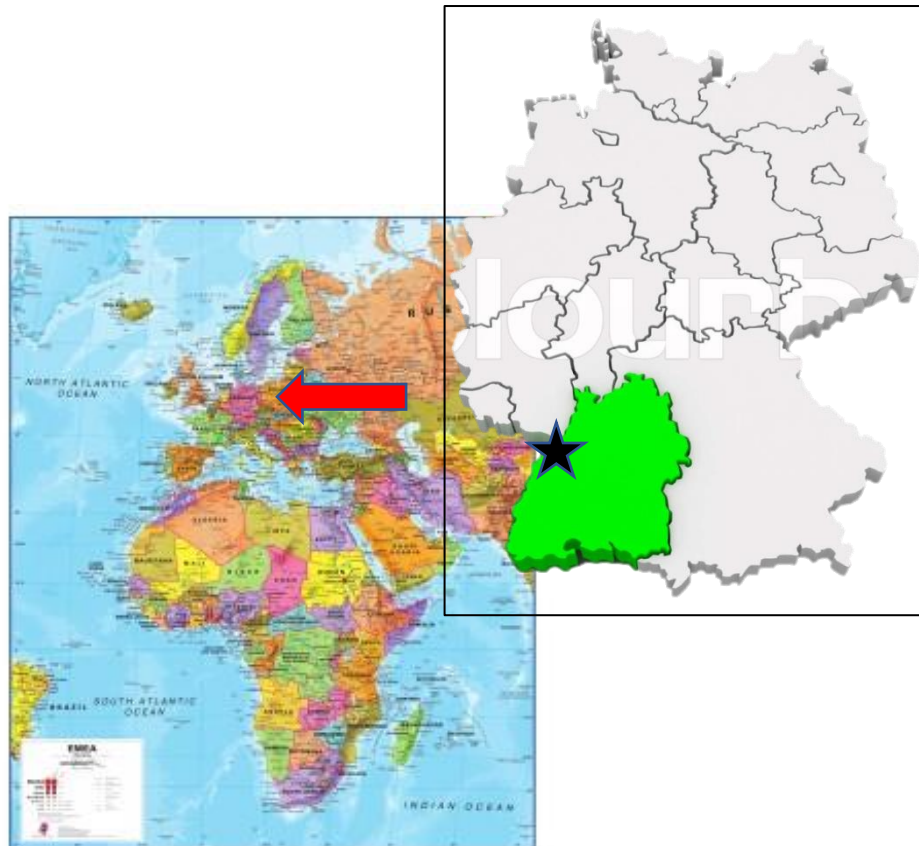
15. November 2017



# Structure of the presentation

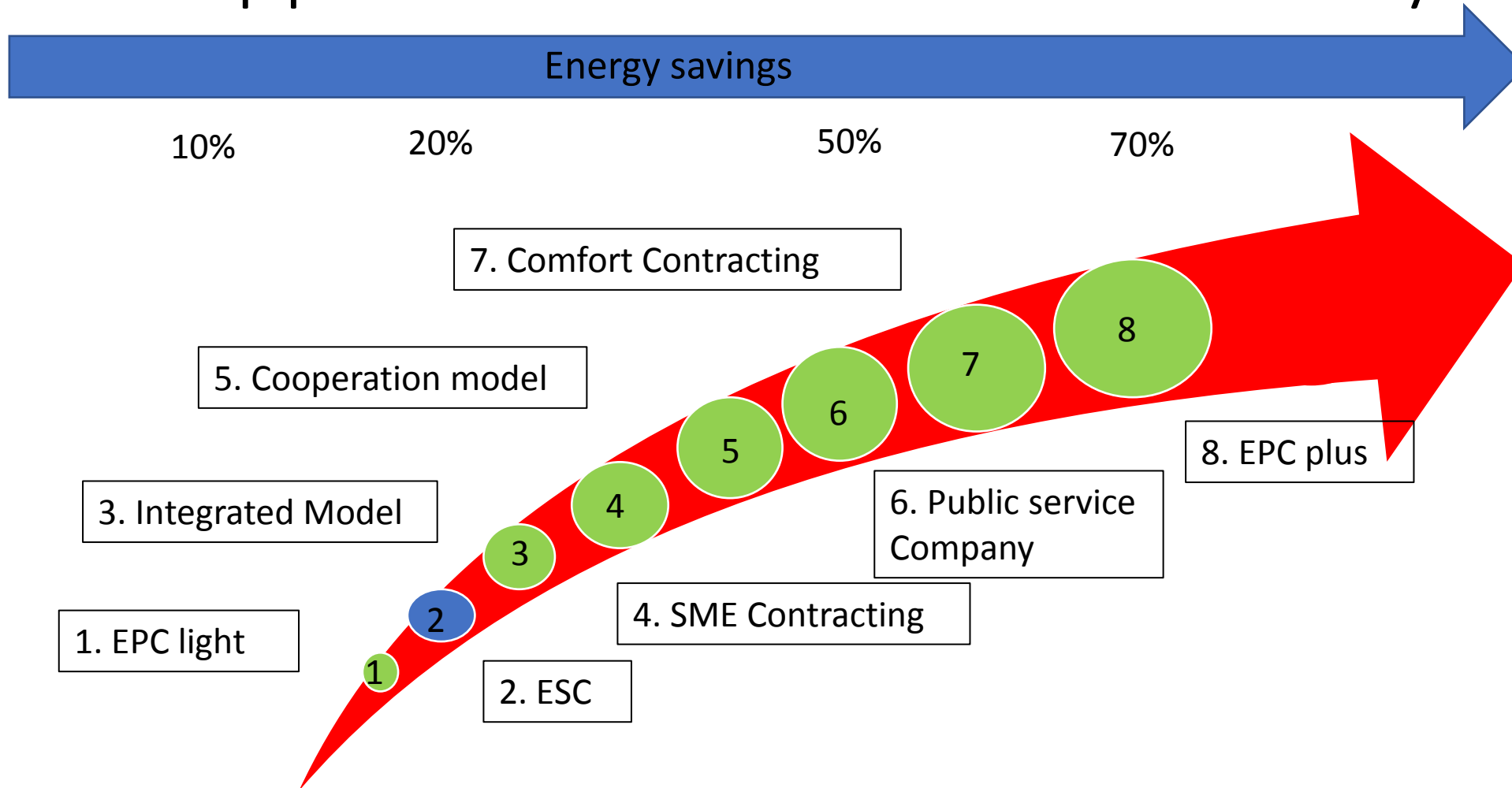
- New ESCo models
- Success factors for ESCo's
- Role of the public authorities
- Financing instruments
- Risk assessment
- Conclusions

# Climate Protection and Energy Agency Baden-Württemberg (KEA)



- Climate protection
- Energy management
- District heating systems
- Combined heat and power generation
- Refurbishment of old buildings
- Contracting

# New approaches for ESCOs in Germany and Europe



# Energy Performance Contracting Light

## Energy saving measures in 12 schools and 3 administration buildings in Berlin

- Measures:
  - Establishing an energy management system
  - Optimizing technical equipment periodically
  - Controlling the energy consumption

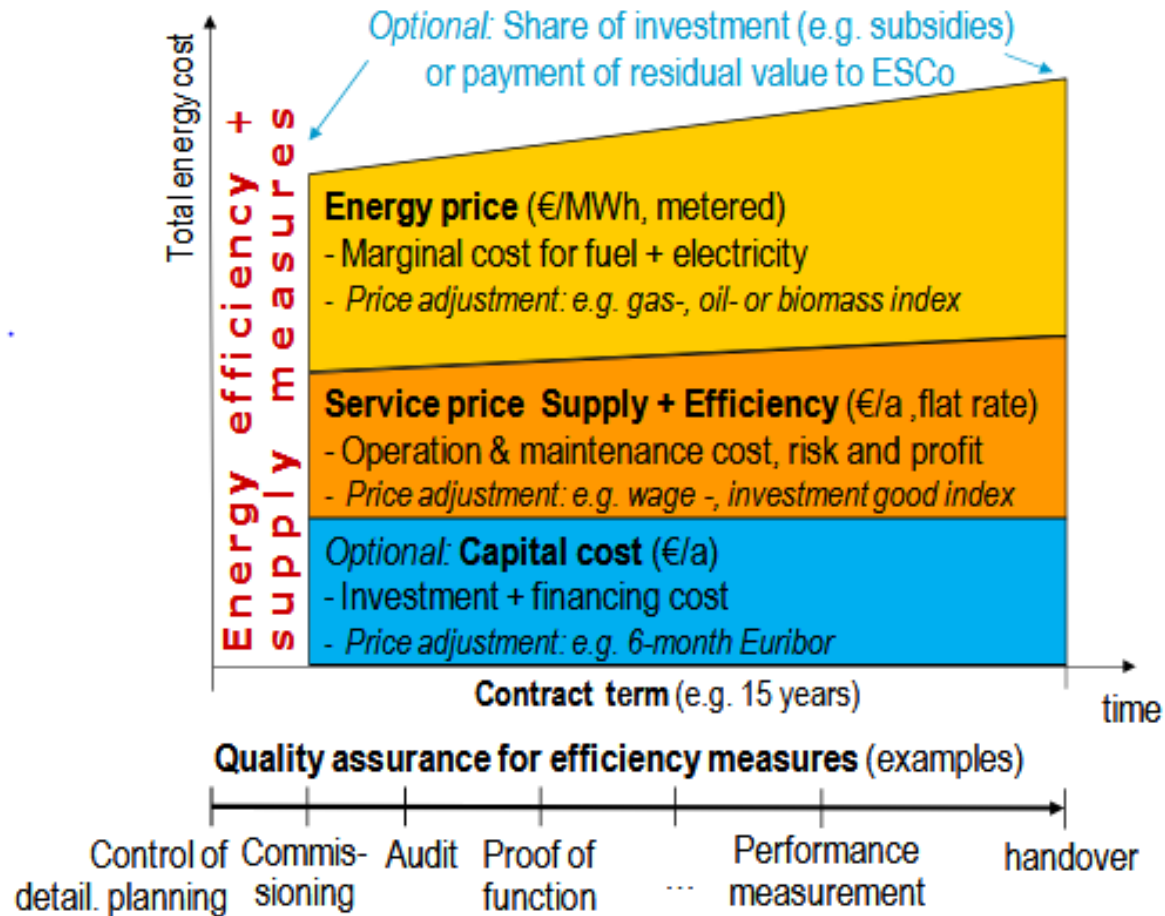
### Advanced model

- Optimizing the contracts from public utility services
- Small investments in control strategies (timers, valves,...)
- Training of energy managers, users, stakeholders, middle and other managers

Source: energianeta Barcelona

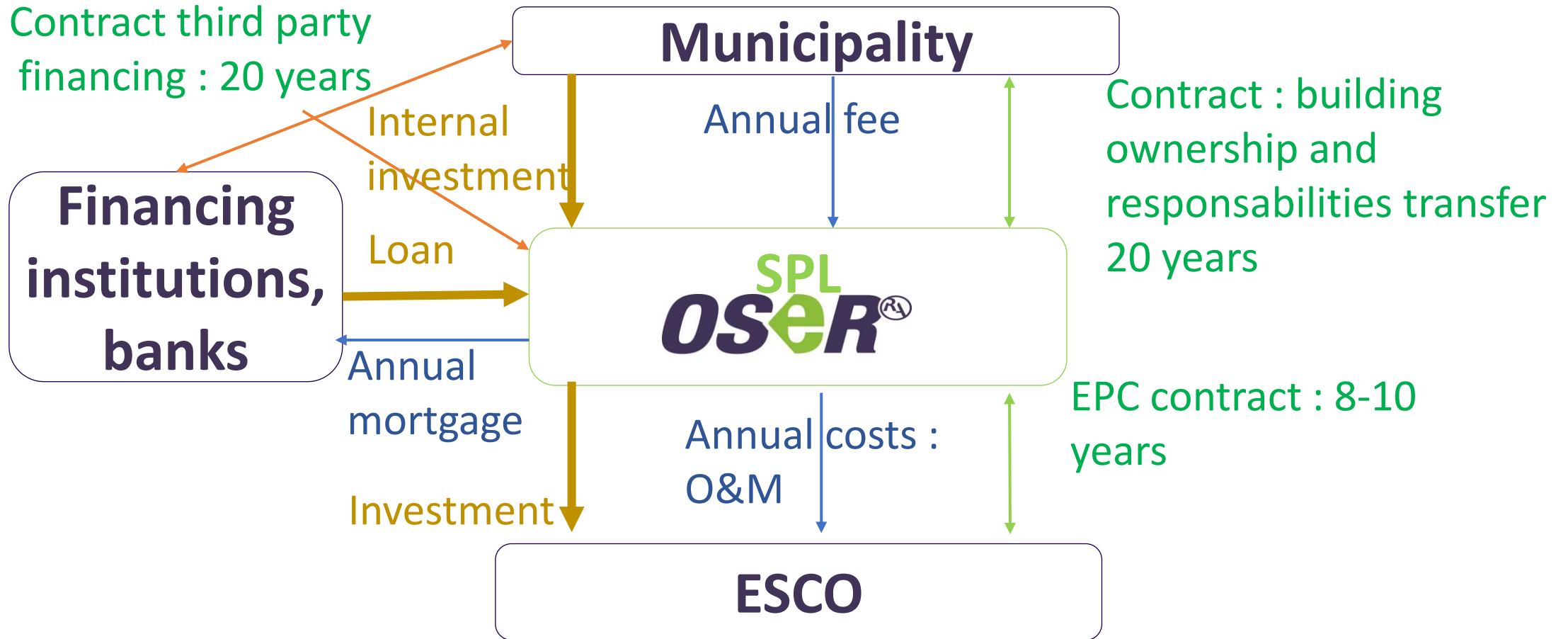


# Integrated Contracting Model



Source: Jan W. Bleyl-Androschin

# ESCO model in Auvergne-Rhône-Alpes region



# SME Contracting

Customer

*Commerce, trade, industry*

*Hospitals, nursing homes...*

*Real estate, dwellings*

*Public buildings*




## New ESCO (SME)

- Planning and calculation
- Controlling and operation



## Trademen

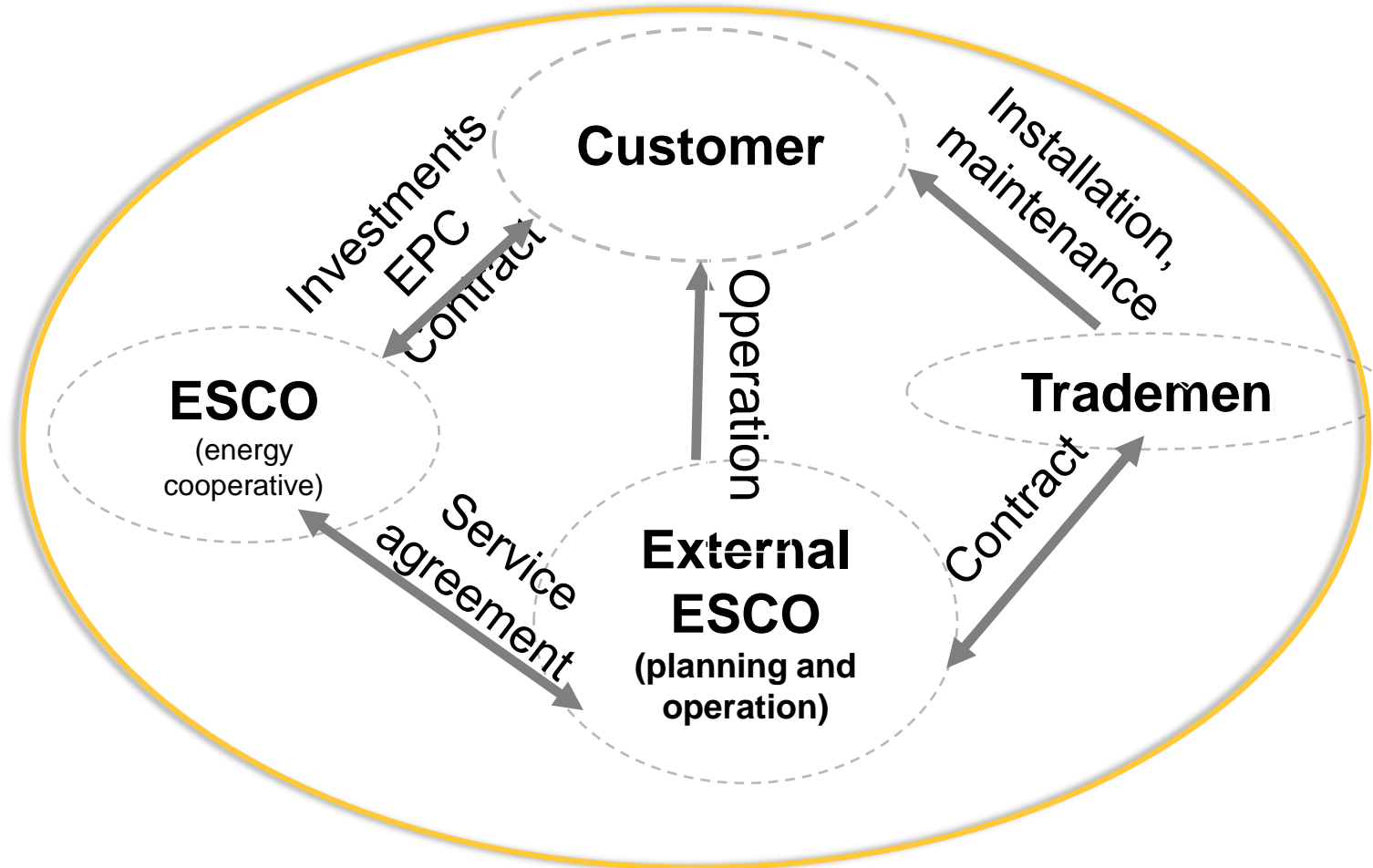
- Installation
- Maintenance



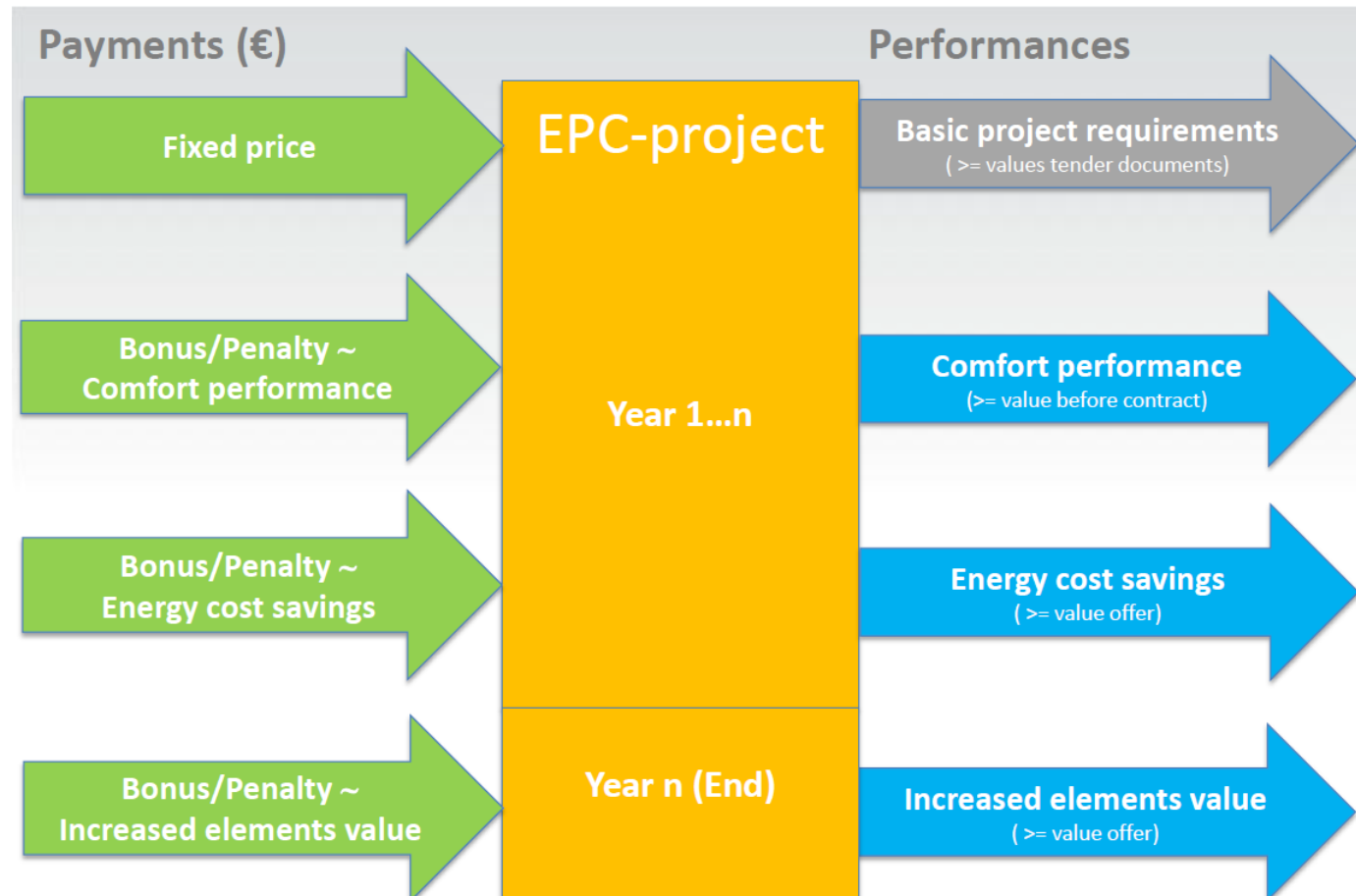
## Funding



# SME Contracting /Cooperation model



# Comfort Contracting

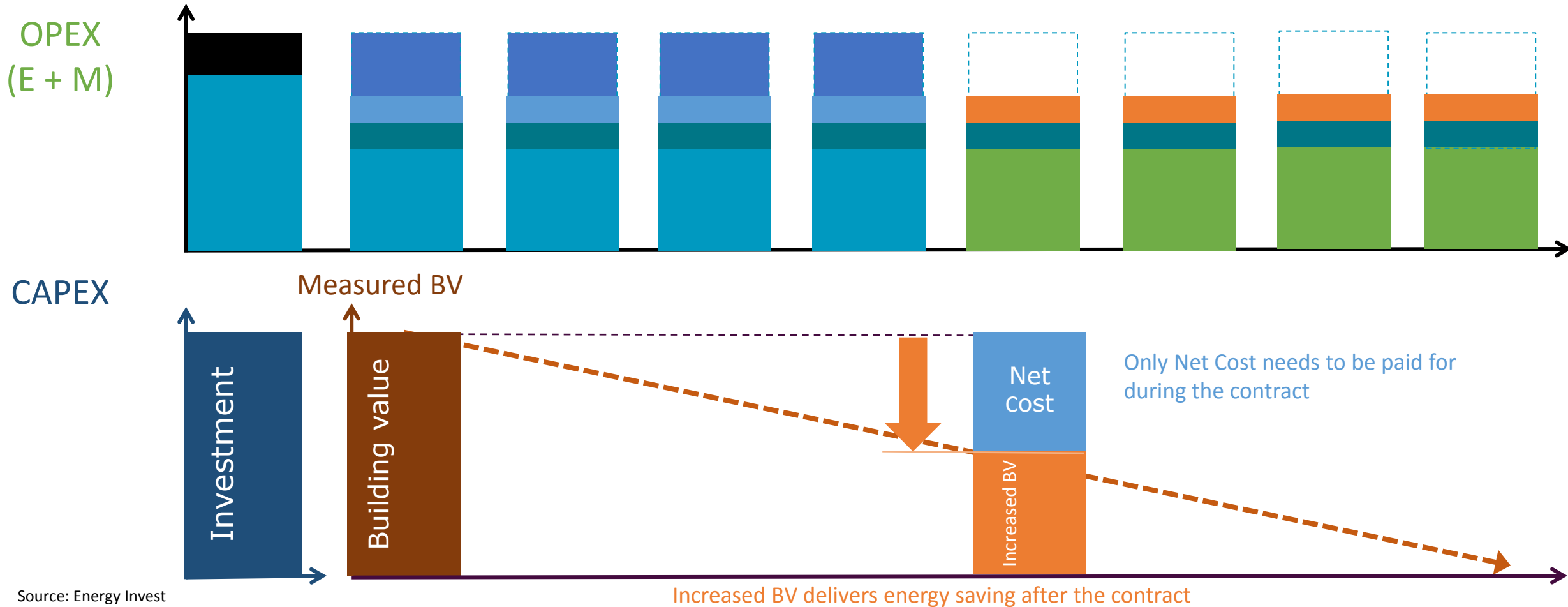


# Comfort-Contracting: comfort-meter

ARE YOU SURE THAT YOUR BUILDING  
PERFORMS OPTIMALLY?



# Comfort Contracting: Building value



# EPC plus: Construction and insulation measures

Student's dormitory in Germany

Measures in eight buildings:

- New heat transfer stations
- Fresh water loading system
- Building automation system, Energy management
- Lighting, New windows and doors
- Insulation of walls and cellar ceiling
- Air condition systems, heat recovery



Complete costs:	ca. 2,4 Mill. € (40,2 Mill. ZAR)
Saving guarantee:	145,000 €/y (2,4 Mill. ZAR)
Pay-back time	16 years

# Success factors for ESCOs

- Project fits to customers requirements
- Project preparation by a facilitator
- Plausible baseline and cost calculation (Cash flow assessment)
- Proven algorithms for their adaptations
- Clear project assessment from financing institutions
- Project pooling
- Quality assurance
- Risk assessment / de risking instruments
- Transparency

# Role of the public authorities in boosting ESCo markets



Many obstacles on

- political,
- financial and economic,
- administrative,
- project levels.

# Success factors for the market development

## 1. Political and legal level

- Political commitment for ESCo projects / energy efficiency

## 2. Economic and financial level

- Economic projects
- Available financing , including risk mitigation instruments
- Accepted due diligence procedures and standardized processes

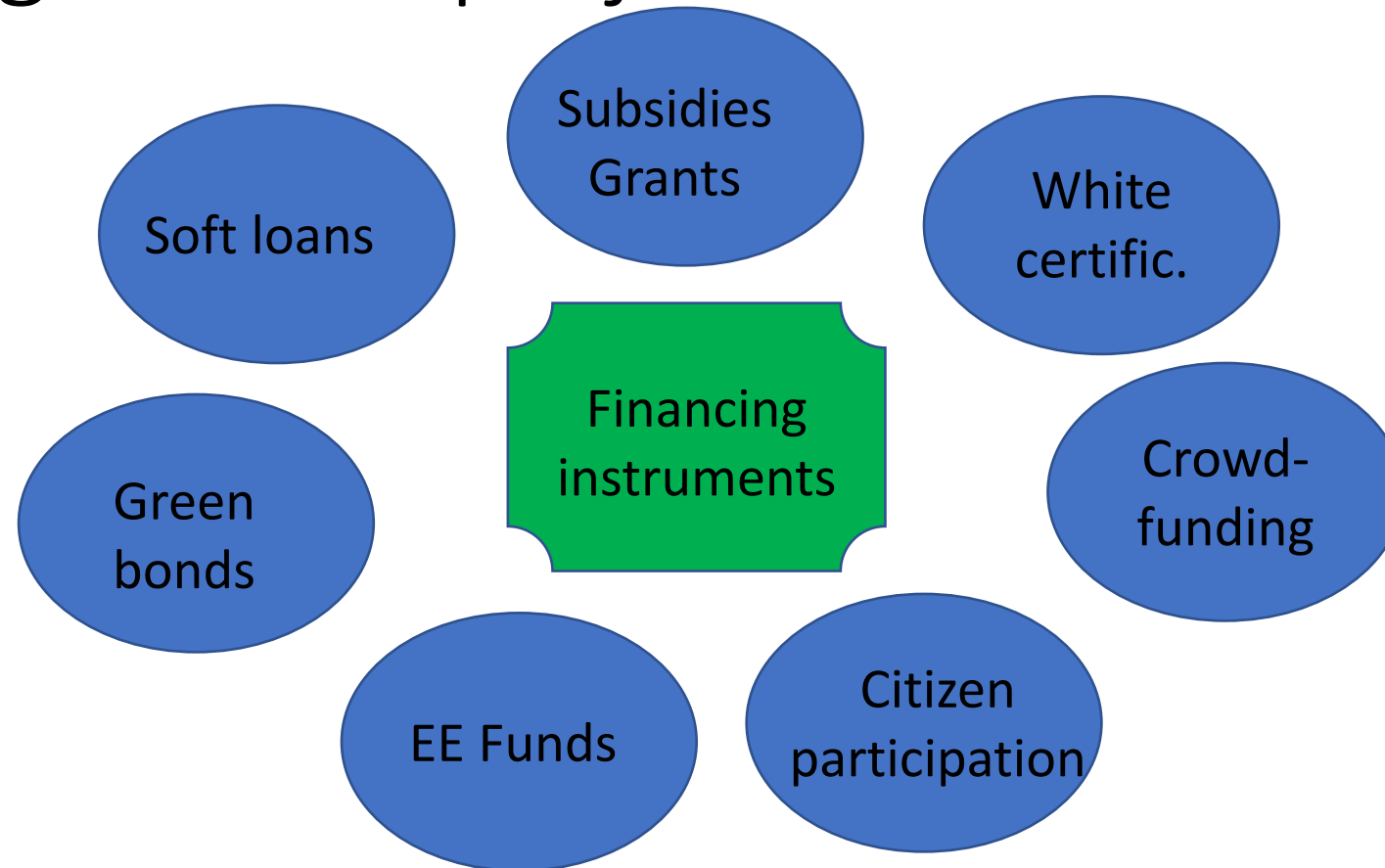
## 3. Administrative level

- Qualification (facilitators and ESCos ...)
- Raised awareness (customers, ESCos, energy advisers, energy auditors, public authorities ,..)

## 4. Project level

- Plausible baseline calculations, cost calculations and energy saving calculations
- Quality assurance and reliable M&V systems

# Financing of ESCo projects



# Soft loans, subsidies, grants

- Subsidies for the energy efficiency investments
- Germany: many programmes that focus on the implementation but avoid incentives for efficient operation
- Two programmes that are related to the energy savings

# Sustainable Energy Efficiency Investment Fund

- Focus: renewable energy, energy efficiency and energy distribution and storage
- SUSI Energy Efficiency Fund has in total 300 bn. EUR investment capital
- **Investment principles:**
  - Long term stable returns
  - Small correlation with financial markets
  - Measurable environmental effects
- 100 % funding with private capital
- Project duration of 4- 12 years
- Investment Volume of 1 Mill. EUR to 30 Mill. EUR (500 Mill. ZAR)
- **Three-way-Partnership:**
  - Order by the asset owner
  - Funding by the institutionale investor
  - Implementation by the technology partner



Source: Homepage „SUSI Partners AG“

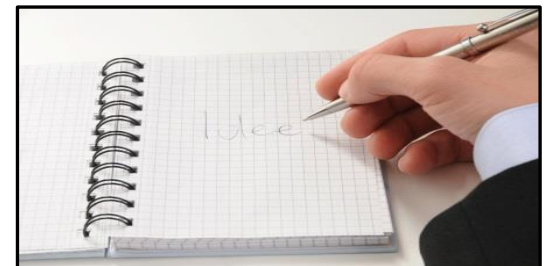
# Green Bonds

## Four different types of Green Bonds:

- Green Use of Proceeds Bonds
- Green Use of Proceeds Revenue Bonds
- Green Project Bonds
- Green Securitized Bonds

## Green Bond Principles:

- Voluntary Process Guidelines for Issuing Green Bonds
- Released in 2014
- Guidelines including:
  - Use of Proceeds
  - Process for Project Evaluation
  - Selection, Management of Proceeds
  - Reporting



# Crowdfunding

- Small investments from a large number of private individuals (Crowd) to finance new business projects
- Easy access to networks through social media (facebook,...)
- High potential to raise the fund for new projects by expanding the pool of investors
- Venture capital: No capital guarantee or security if the project fails
- Best practise example: **Bettervest (Germany)** - One of the first crowd investment platforms for energy efficiency projects
- Investors can finance the projects of companies, municipalities and associations
- Projects and their potential for energy savings are assessed by an energy consultant
- 100 % funding with private capital, Investment volume: up to 300,000 Euro (app. 5 mill. ZAR )
- < 10 years project duration, > 5 percent expected rate of return for investors
- People invest in these project because of a personal belief and willingness to help save environment



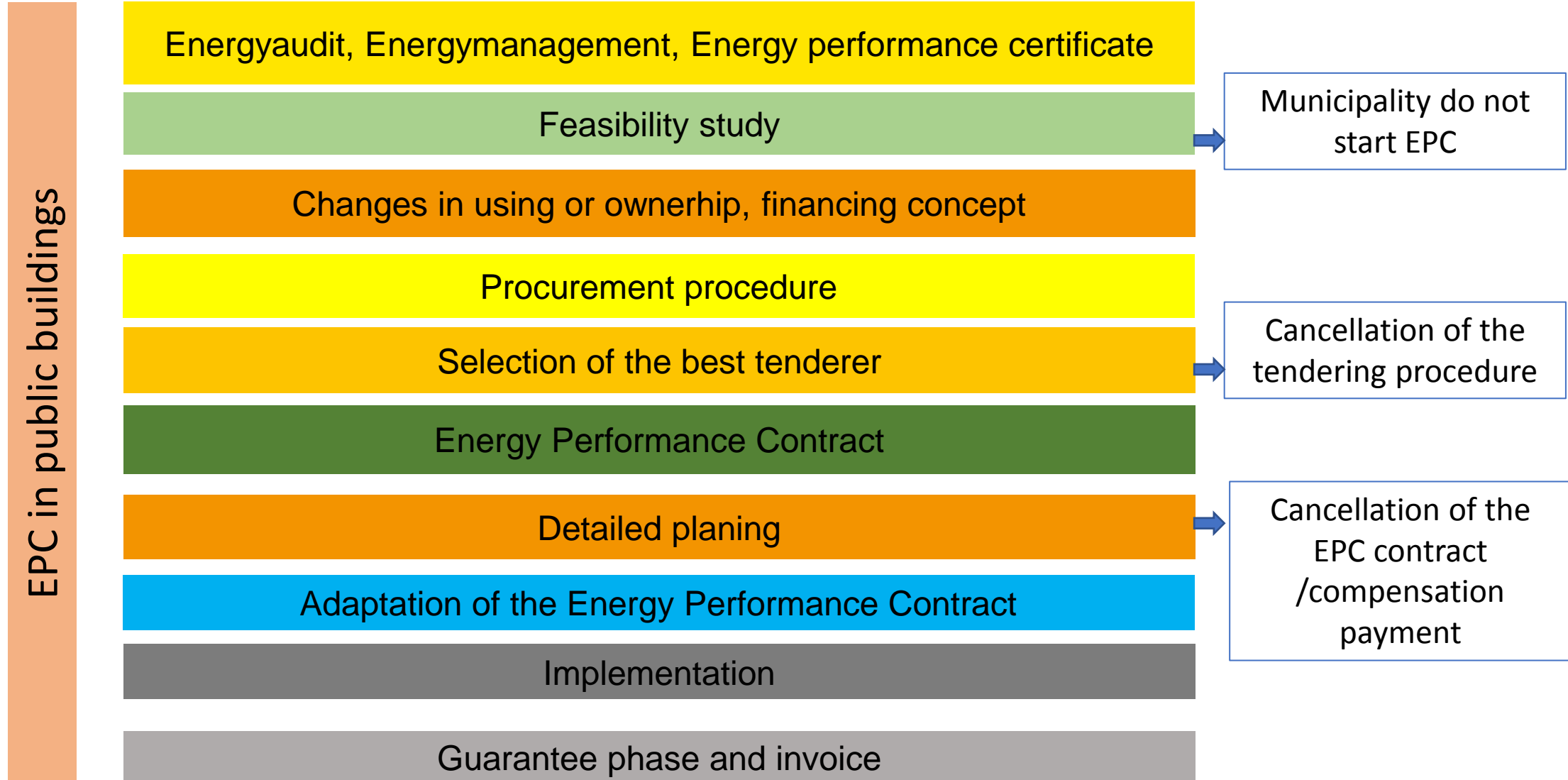
# Citizen Participation

- Private individuals can influence through their investments the process of the projects (decision-making process)
- Less administration costs than other models
- Every member of the association has one voting right (cooperative), **Limited liability**: only the invested capital is liable (Germany)
- Increasing the required equity capital for funding projects

## Best practice example: Regionale Energieeffizienz Genossenschaft (REEG)

- A regional association for energy efficiency projects
- Citizens, companies, financial institutes, unions and municipalities in a region found a REEG
- Investment capital comes from the REEG members (subordinated loan)
- REEG members and non-members can apply for capital for their projects
- Dividend for REEG members : **4 %**





# Potential risks and risk mitigation strategies

Potential risks from the ESCO's point of view	Risk mitigation options
<ul style="list-style-type: none"> <li>➤ Political <b>framework conditions</b>.</li> <li>➤ <b>Ending of payment</b> by the public building owner</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Short</b> the contract duration as possible.</li> <li>➤ <b>Clear provisions</b> for the full compensation of the ESCO's losses.</li> </ul>
<ul style="list-style-type: none"> <li>➤ <b>Delays in payments</b> by the public building owner.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Compensation rules</b> in case of delay of payments to be established in the contract.</li> </ul>
<ul style="list-style-type: none"> <li>➤ <b>Dispute</b> between the ESCO and the building owner.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Plausibility check</b> of the requested performance guarantee.</li> <li>➤ Involvement of a certified <b>third party</b></li> <li>➤ <b>Monthly installments</b> to be paid by the building owner.</li> <li>➤ Penalties/incentives only after dispute being settled.</li> </ul>
<ul style="list-style-type: none"> <li>➤ <b>Failures</b> in achieving guaranteed savings.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Two stage procedure</b></li> <li>➤ <b>Agreed floor (5-10%) for saving deviation.</b></li> <li>➤ Take out <b>insurance</b></li> <li>➤ <b>Bank guarantee programme.</b></li> </ul>

# Potential risks and risk mitigation strategies

Potential risks <u>from the ESCO's point of view (cont.)</u>	Risk mitigation options
<ul style="list-style-type: none"> <li>➤ Incorrect <b>baseline</b> data</li> </ul>	<ul style="list-style-type: none"> <li>✓ <b>Check</b> of baseline data during project preparation and planning.</li> </ul>
<ul style="list-style-type: none"> <li>➤ <b>Planning errors</b></li> </ul>	<ul style="list-style-type: none"> <li>✓ <b>Specialist</b> engineers for specific facilities /qualification/standardisation</li> <li>✓ <b>Two stage</b> procedure</li> </ul>
<ul style="list-style-type: none"> <li>➤ <b>Failure</b> of technical equipment or damage</li> </ul>	<ul style="list-style-type: none"> <li>✓ Subcontracts specifying responsibilities and <b>liabilities</b> of subcontractors, <b>quality standards</b> of applied equipment and <b>qualification</b> of assigned staff.</li> </ul>
<ul style="list-style-type: none"> <li>➤ Installation of new facilities or the change of building use → <b>higher energy consumption.</b></li> </ul>	<ul style="list-style-type: none"> <li>✓ Clear provisions describing reference equipment and use of the building, and <b>methods</b> and <b>tools</b> for compensations when calculating and verifying guaranteed savings.</li> </ul>

# Conclusions

- Energy services can be adapted on the customers and the ESCO's needs.
- Potential ESCOs should focus on existing success factors.
- Boosting EPC by the public authority will only be successful with concerted actions.
- New financing instruments may be a additional option.
- ESCOs risks associated with ESCO models can be limited.

THANK YOU FOR LISTENING!

And much success in your future efforts applying ESCo models  
in South African buildings!

Konstanze Stein

[Konstanze.stein@kea-bw.de](mailto:Konstanze.stein@kea-bw.de)

Phone: 0049 721 984 71 – 24