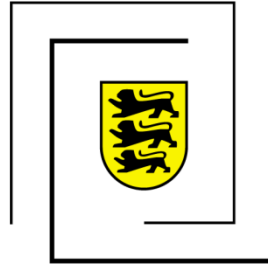


Klimaschutz- und
Energieagentur
Baden-Württemberg
GmbH



KEA

InEECO – Initiative Energy Efficiency Contracting in Baden- Württemberg´s Public Buildings

Rüdiger Lohse

June 2019, Managenergy



- KEA- regional energy and climate protection agency in 1 minute
- Provide information on the structure of the first year of experience with the INEECO project funded by the EIB ELENA program
- Create a basic understanding of how the INEECO effort is integrated in KEA's market development activities
- Target group of this presentation: energy agencies or other regional entities considering to prepare an ELENA proposal



RE& EE
concepts in
buildings,
neighborhoods

Energy Master
Planning (region,
cities, neighborhoods)

R&D innovative
financing
instruments

market facilitation
for energy services
Contracting Initiative

RE& EE in
SME

Implement
regional
climate
protection
concept

User behaviour
programs

EPC /ESC
facilitation

Non- investive
energy
commissioning

Consultants
for policy
makers,
government

Turnover €4M
33 employees
(75% engineers,
architects)



KEA

2-KEA in the Regional Energy Service Markets

- 1110 municipalities, 35 counties in Baden- Württemberg
- 38% of region are woods
- Average number of inhabitants: 10.000 / municipality
- Number of municipalities > 30.000 inh.: 45

Regional building sector action plan:

- buildings eligible for energy services: 80.000 (380 Mm²)
- Average age of building fabric and infrastructure: 35 yrs
- Average age of HVAC: 25 yrs
- Potential for deep refurbishment: €250- 300bn < 15 yrs

Regional ESCOs: bring SMEs into the game! 25 utilities and 20 handcraft SMEs providing Energy Supply Contracting; EPC providers: 10 from which are 2 SME EPC providers+ 2 utilities



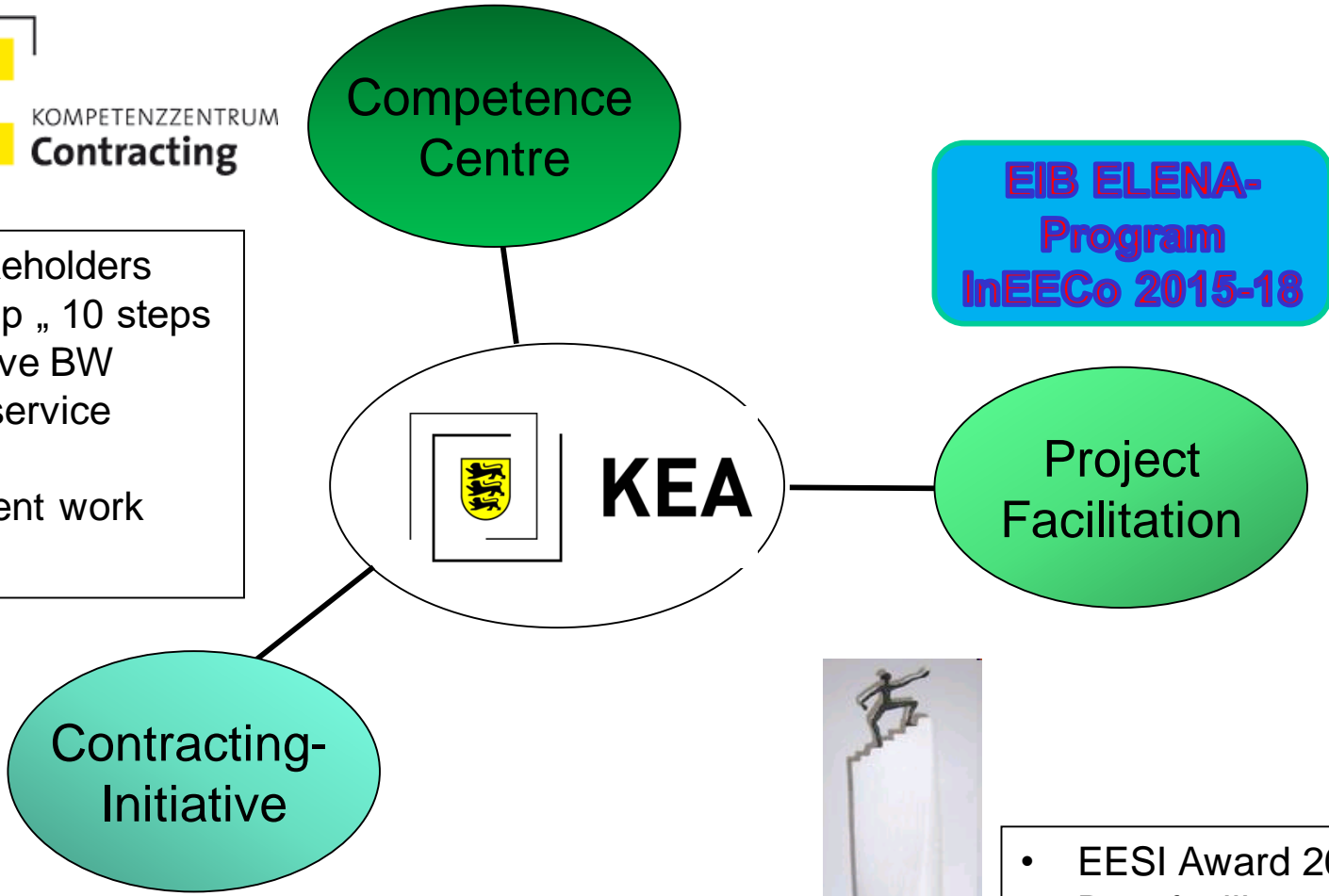


KEA

Our role in the energy service market



- 120 stakeholders
- Roadmap „ 10 steps to improve BW energy service market
- Permanent work process



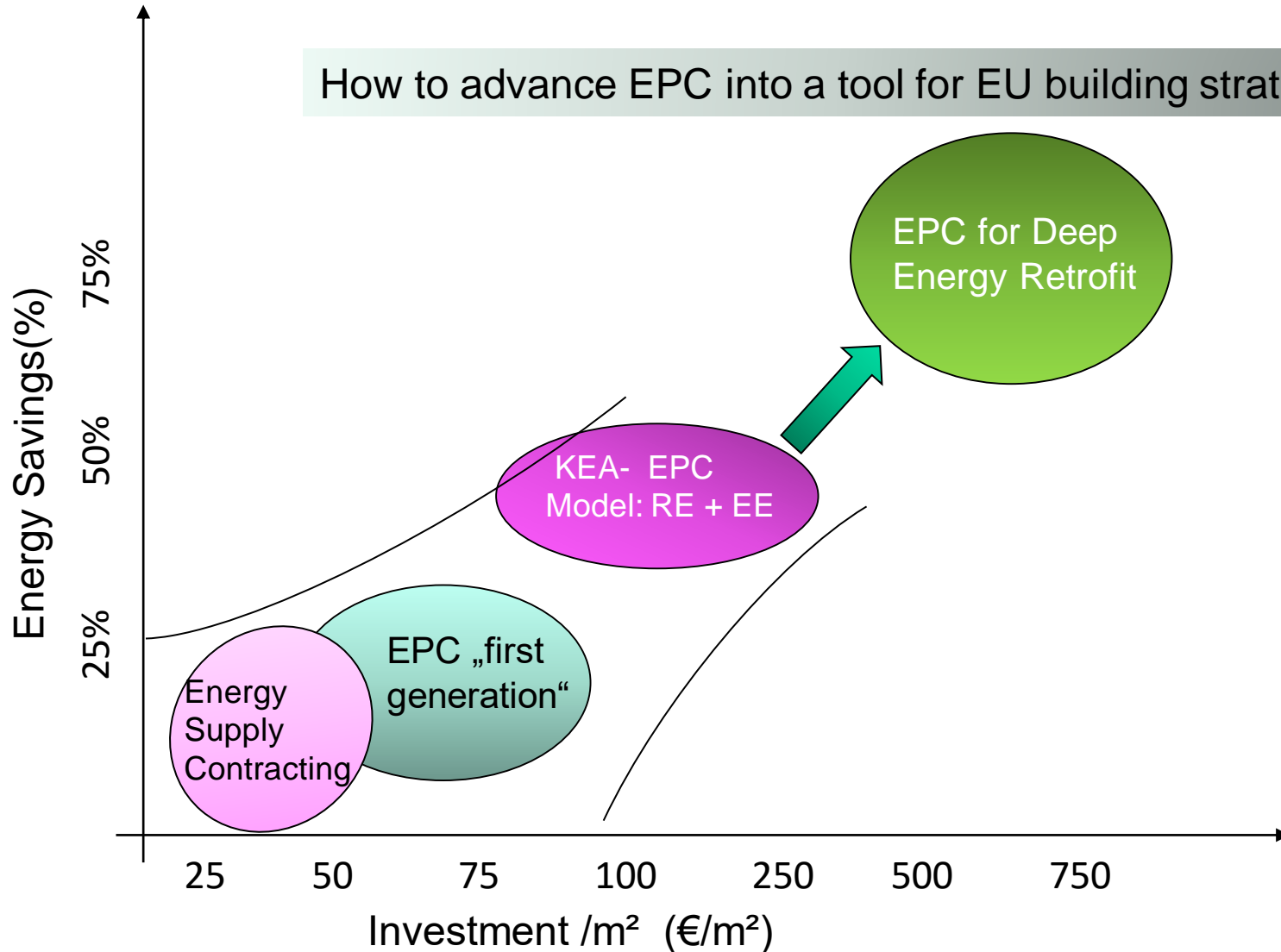
- EESI Award 2009
- Best facilitator



KEA

EPC in the energy efficiency strategies in buildings and neighborhoods

How to advance EPC into a tool for EU building strategy





KEA

EPC as a tool to implement Regional energy efficiency strategies in buildings and neighborhoods

- **Regional Framework Conditions:** respecting regional decision making criteria:
 - High identification with public infrastructure
 - Money inserted into EE, de- carb, RE projects will be tracked over time by administration and an interested community
 - Reluctance to financing tools – only spend what you have
 - Decision making will always refer to strong SME structures
- **Design of Energy Performance Contracting Solutions**
 - No **low- hanging fruits-** investments
 - Include a **mix of energy and non- energy related measures** when you touch the building anyway
 - Specific investment costs initiated in Regional EPC: **80- 150 €/m² (compared to 30- 50 €/m² in average in Germany)**



KEA

Strategy to Achieve Deep Energy Reductions 3- Tendering and terms of rating

Preparation:

Feasibility study, list of measures, decision making process of the public administration

Call for Tenders: References, experience in foreseen measures (Green ESPC, integrative concepts...)

Tendering Documents: ESPContract, procurement guideline, **terms of rating**, measure list

Negotiation phase, optimization of bids, last call, final rating and evaluation of bids → winner gets 1. Step of ESPContract (planning+design)

Evaluation II: Evaluation of 1. step results, small divergence of results → 2. step of ESPContract (construction and performance phase)



KEA

2.Strategy to Achieve Deep Energy Reductions 3- Terms of Rating

	ESPC classic (i.e. Berlin model)	KEA's ESPC integrative
Terms of rating	Net Present Value of savings in total and remaining with administration 70- 80%	Net present value of savings in total and remaining with administration 40- 50%
	Contract period 10- 20%	Measures (Quality) 40 %
	Carbon Footprint 10-20%	Carbon Footprint 10-20%
Additional Terms	-	Avoided maintenance costs for existing installations are part of the saving
Measures Achieved	HVAC, mainly not integrative with short pay back	Integrative measure bundles with demand and supply side measures, Green ESPC, refurbishment measures without e- saving effects



Target: EPC as a major tool for EU building refurbishment strategy

Next step is to implement the thermal envelope in advanced EPC business models

- **Complexity of the projects will be significantly increasing → also cost, contract period and risk**
- **few experience with “design/performance” available on EU level**
- **Long contract periods (>>15 a) → new financing models**
- **ESPC- contracts and existing tendering process is not viable for thermal envelope**
- **→ KEA conducts research programs on national level (EDLIG) and on IEA level (IEA EBC Annex 61) to advance existing performance related business models towards the integration of DER**
- **→ r+d about the synergistic effects of bundles**
- **→ r+d on influence of climate, building application, energy rates and risks on the design of bundles**



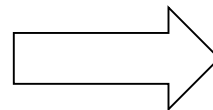
KEA

3 – How EPC can increase the refurbishment ? Projects from regional EPC model: energy saving + fuel switch => energy & infrastructure refurb

- Business model integrating **biomass and energy savings** → **increased savings potential allows for non- energy related deep refurbishment:**

PFINZTAL:

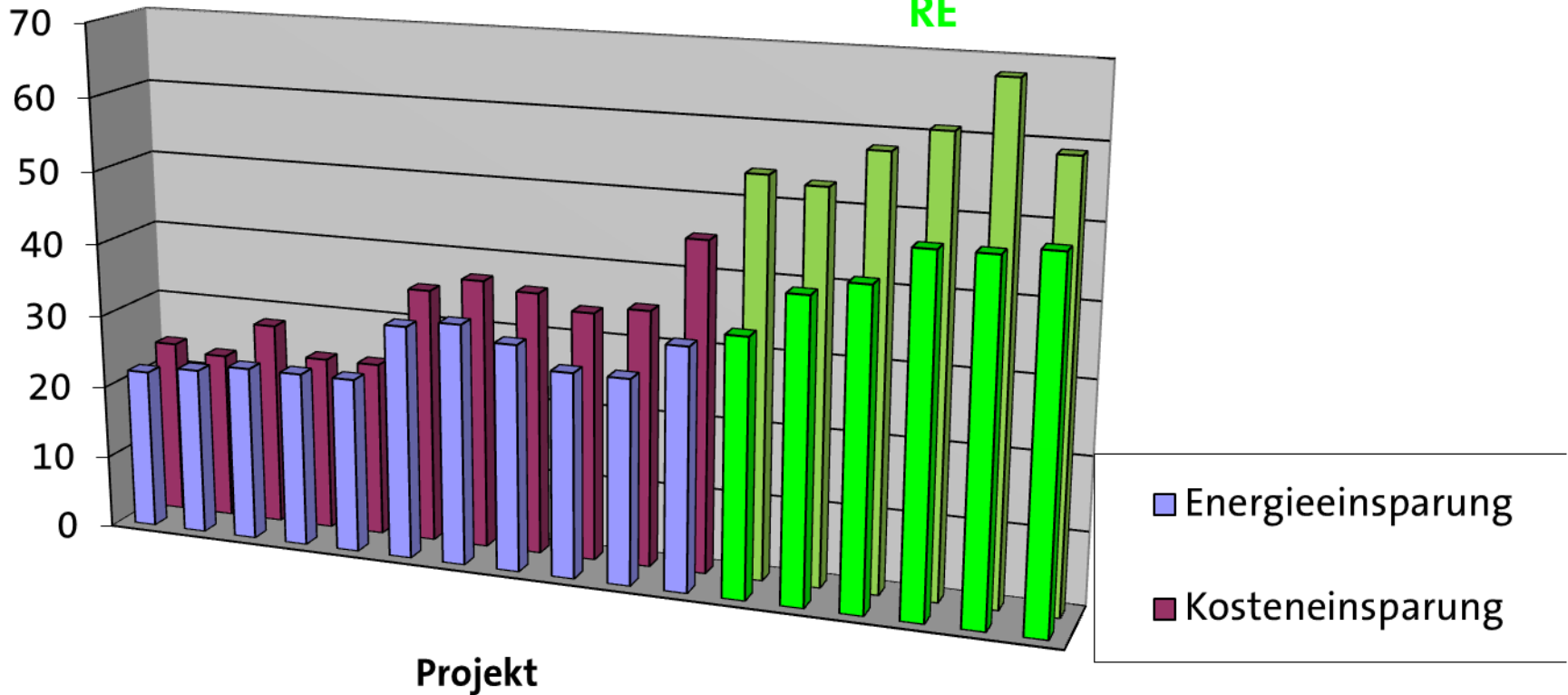
- EPC based on biomass and micro grid co- funds the refurbishment of a wrecked swimming pool building
- Energy Baseline: 170 k€/a → energy cost savings 75%
- Payback of 9 years for energetic measures (5 buildings with new micro grid, new lighting, hot water, building control, pumps, biomass boiler with wood and hot water storage
- By increasing from 9 to 15 years: full refurbishment of public swimming pool
-





Energy and Cost savings of 18 ESC- Projects from 2002- 2014

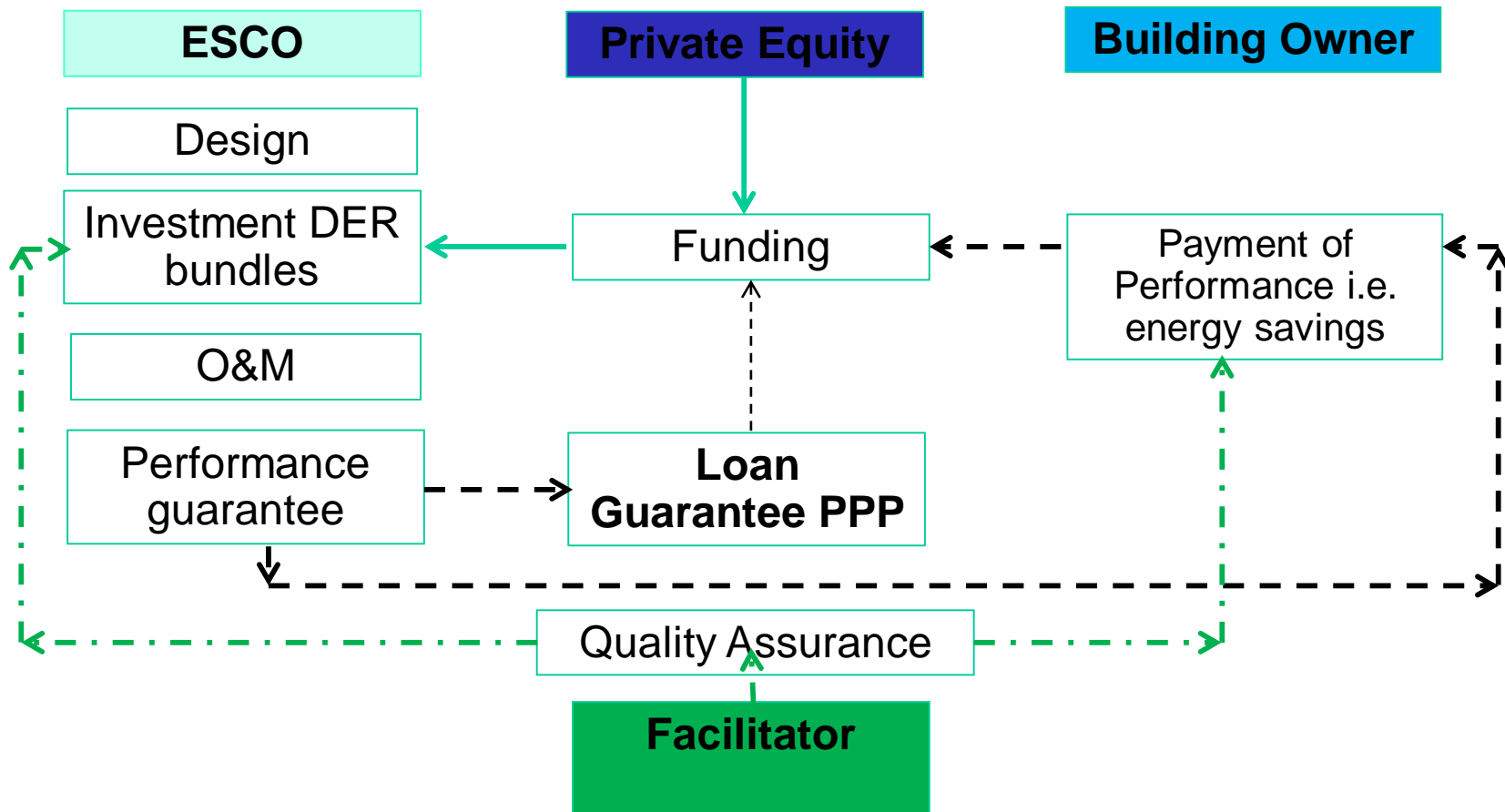
RE





KEA 3 – How EPC can increase the refurbishment? Deeper concepts with advanced business models

- **Develop of advanced business model** allocating investments and services between building owner and ESCOs, development of financing mechanism



LCC- considerable cost benefits of DER

	Life Cycle Cost	Calculation	Variations and Values
1	Energy savings: effects from improving the e- performance of equipment by maintenance or replacement	$kWh_{savings} \times \text{energy price}$	Fixed or flexible energy price; in DER it is expected to at least reduce by 50% Values: Germany office building stock 7-14€/m²yr
2	Energy savings II	$kWh_{RE\ replacing\ fossile} \times \text{energy price } (RE- fossile)$	kWh replaced by RE; fixed or flexible energy prices;
3	Reduced maintenance I	Maintenance costs for replaced, worn down equipment at the end of its life cycle as a percentage of the new investment value	Average percentage value or end of life cycle value (→ graph LCC maintenance) Values applied at the market: - 0,25\$/ft² in US; EU: - 2 to -4 €/m²
4	Reduced maintenance II	Downsizing of investment in a DER bundle means reduction of investment cost related maintenance	A component downsized by 30% reduces maintenance costs by 30%
5	Reduced operation costs I	Building automation reduce operation workloads	Consider workplans and operation schedules individually

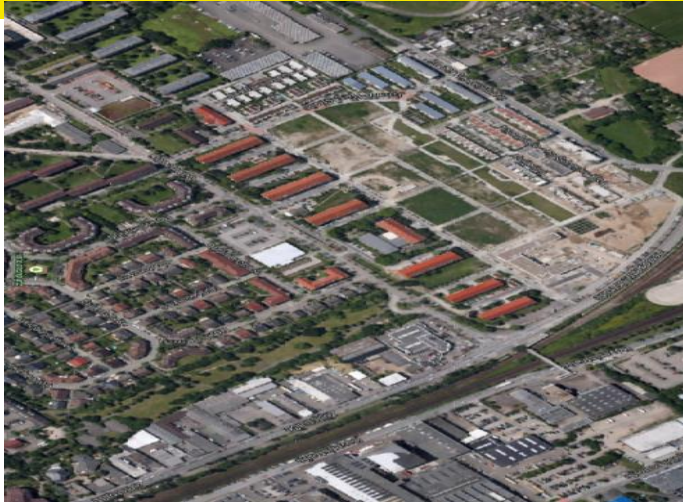


KEA

IEA Annex 61 Case study: Dormitory, DER EPC including thermal envelope, Mannheim, Germany

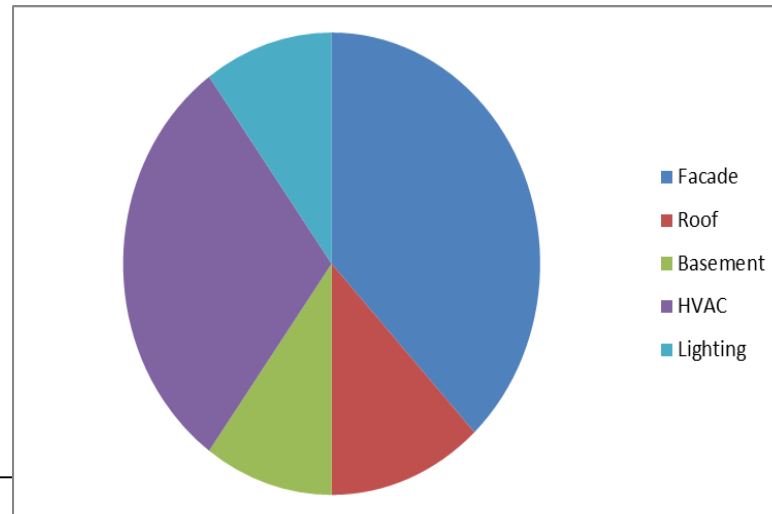
Project Facts:

- **Year of Construction:** 1960
- **Square Meters useful area:** 4 buildings each 2667 m²
- **EUI** 120 kWh/m² yr heating; 33 kWh/m²yr el. Power
- **Energy & Water Cost baseline:** 304.500 €/yr
- **Maintenance costs:** 143.000 €/yr
- **Investment Value:** 1 780 000 €
- **Annual Energy Cost Reduction:** 101 800 €
- **Payback Period** –19 years
- **Energy Reduction Percentage:** 67%
- **ESCO:** tbd
- **ECMs based upon Investment**



Buildings Included:

- 4 dormitories





„Initiative **E**nergiespar- und **E**nergieeffizienz-**C**ontracting in
öffentlichen Gebäuden“

- Co- funded by EIB, ELENA program (**E**uropean **L**ocal **E**nergy Assistance)
- Targets:
 - a) direct: initiate €30M in 3 years in approx. 15- 20 EPC projects; guidelines and simplified tools for EPC in public buildings
 - b) indirect: qualification of facilitators, EPC market development in Baden- Württemberg
- Implementing instrument in the context of the Contracting Initiative BW



- **What will be subsidized:** facilitation process for projects providing a signed ESCO contract
- **Target group:** public buildings, municipalities, counties, public bodies,
- **Leverage factor:** 20:1
- The leverage factor is supporting projects which aim at medium to high level investments

Example calculation:

- Investment costs initiated by EPC project : 2.000.000 €
- Facilitation costs: 100.000 €*
- Leverage factor: $2.000.000 \text{ €} / 20 = 100.000 \text{ €}$
- The subsidy may be 90% of 100.000 €



Project time period: 3 yrs

Start: April 2015

Timeline:

- March- July 15: information phase
- April 2016: EPC investments appr. €10 M
- April 2017: EPC investments appr. €20 M
- April 2018: EPC investments appr. €30 M
- Meeting of steering committee and interim reports: month 6, 12, 18, 24, 30, 36





Ineeco steering group

- Discussion of terms and conditions between facilitators and building owners
- Discussion and optimization of tendering and stipulation material
- Development of a new re- financing tool for ESCOs
- Development of a information campaign to push the demand
- Assessment of the approval process of EPC in the public sector
- Members: Association of Municipalities, Cities, Counties, public hospitals, public social entities, ESCOs, funding entities

Ineeco working group:

- Lead of Ineeco & risk carrier: KEA
- Project coordination
- Quality assurance
- Co- Workers: regional EAs, 1 SME facilitator, 2 engineering companies



Ineeco Working Group

- Networking group of facilitators providing services under the umbrella of the InEECo project
- Discussion, optimization and application of KEA's standardized tendering and stipulation material
- Training and twinning programs for new facilitators
- Joint acquisition of projects (helps both sides: stimulates hit rate of facilitators, reduces work load at KEA's InEECo team)
- Number of facilitators cooperating in 2015: 2 → Target: > 20



■ Ineeco- Task force „Public information campaign“

■ Target groups

- Municipal decision makers, stata building management
- ESCOs, handcraft companies, SMEs, municipal utilities
- Facilitators in regional energy agencies and engineering com
- Funding entities
- Associations of public bodies

■ Core Messages:

- Ineeco structure (brief)
- Supported activities
- Example calculations
- Coordination with other grant programs

■ Distribution path ways:

- 50% of activities are put in meetings on local level (co-ordinator level)
- E- mail, Ineeco - homepage





- **Task force group „Business Models/Financing“**
- 30 M€ to be refunded by ESCOs are a considerable baseline to research on alternative re- funding sources for ESCOs.
- Targets:
 - Set up refinancing pool for EPC projects with attractive fixed mid- term loan interest rates, including forfaiting model
 - Develop project level technical and economical assessment tool for EPC projects
 - Develop mutual federal and stataal funded re- assurance tools for loan program
- Reshaping business models in order to match to the specific requirements of target groups and building types
 - Schools, home for elderly persons, refugee shelters and homes, street-lighting



- **Task force group: Public EPC approval structures**
 - Every public EPC project is considered as a loan related debt and has to be assessed in a complex calculation and approval process (1)
 - Together with legal advisors from statal department of municipal affairs, asscociation of ESCOs and department of environment a working group will be set up to analyze 10 Ineeco projects with special regard „how to simplify the process and increase the transparency of the assessment process
 - Development of a simplified approval process for EPC in public buildings

(1) This might change with the new Eurostat Guidance?



- Great support from EIB – ELENA Team:
 - during proposal, approval and working phase the ELENA team is a great support, Q&As going quickly at a helpdesk
- Approval phase- the loan guarantee
 - Loan guarantee is required by EIB to secure upfront payment (1 tranche)
 - For a SMEA like KEA the decision making process for a 1,4 M€ loan guarantee is a challenge (it is about 25% of our annual turn over) and time consuming → backlog of 5 months (start in Juni 2015)
 - A draft version for the guarantee would allow decision making at an early stage



- Contact and exchange with the other ELENA projects:
 - Suggestion is to intensify this a bit to 1 face-to-face meeting a year
 - Set up a tool box with some templates for interim reports, loan guarantees, PR material etc avoids re- inventing wheels from time to time
- New staff on the pay- roll
 - Very good idea but training costs and time for the „unskilled workforce“ needs to be considered in the time frame of the project.



■ **Market response: demand side**

- The assumption that public entities wait for such programs and that target group will get excited just from the benefit of „almost no- preparation costs“ is WRONG in our case
- It took us 3 months to counter steer that by initiating a PR campaign on the INEECO project which led to a significant increase of newly started projects
- To have it cost- free is very interesting but the approach and reliability of the Ineeco project managers is making the deal- so a strong support by experienced sales staff is required in year 1
- The time it takes from a more or less mature feasibility study to a signed and countersigned EPC contract is never < 6 months
- And it takes even longer for the building owner to get his money back (70% of 30 M€ must be achieved)
- Up to now 12 projects totalling 6.6 M€ of investment are in the facilitation process, 2 are in the implementation phase,
- 8 projects totalling 8 M€ are in the aquisition phase



- ELENA is a great program, attractive and not really complex to manage
- A few organisational topics must be considered carefully in the proposal (i.e. loan guarantee, staff recruiting) and the implementation phase (PR campaign) which require, time, funding and a game plan
- The interaction with market participants is key
- Regions starting the market from scratch need at least 1 yr of prep- phase to bring all stakeholders on board and in a supportive position
- We can recommend this program to other entities



- Key Performance Indicators:
 - Leverage factor is key- due to a good mix of larger > 2 Mio. €/ project + a few very small projects and staying beyond the the 90% support rate the leverage factor has not been an issue
 - End energy reduction = number of EPCs with a strong supply part reduced the average savings of each project from 45% to 38%
 - This can also be seen in the drastically increased RE and CHP contributions
 - The „job creation“ indicators have been dramatically underestimated in the proposal



Overview on InEECo Key-Performance Indicators				
		Planned	Performance	
	Investment			
1	Total eligible investment initiated by InEECo (incl. reinvestment over ESCO contract period)	30,000,000 €	37.032.835 € (48.308.771 €)	
	Costs for Project Facilitation			
2	Leverage Factor (Investment triggered / EIB funding)	20:1	34:1 (45:1)	
3	Environmental Impact			
3a	final energy saved [GWh/a]	23	14.56	
3b	final energy production by CHP [GWh/a]	4,5	12.39	
3c	final energy production by Renewable Energy Sources [GWh/a]	16	13.63	
3d	annual reduction of CO2 eq (to/a)	11,000	9,420	



4 Employment Impact		Proposal	Performance
4a	Additional Workload for energy consultants, engineering companies, project facilitators	3,5 Staff years	6,32 Staff years
4b	KEA working capacities	4 staff years	5,97 staff years
4c	ESCO staff: permanent increasement of staff over the InEECo contract period	-	2 additional staff capacities
4d	Handcraft companies: additional working capacities initiated by InEECo	6 staff years	10,5 staff years



KEA

Questions?



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