

Deep retrofitting via EPC



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FACTOR4
EFFICIENT IN ENERGY

<p>Guaranteed profit</p> <p>Plus+® projects</p> <p>Guaranteed profit with energy efficiency</p> 	<p>Higher productivity</p> <p>Comfortmeter® surveys</p> <p>Comfort measurement campaigns</p> <p>Comfort measures</p> 	<p>Independent advice</p> <p>Development of smartEPC® (first EPC-contract in Belgium)</p> <p>EPC facilitator</p> <p>Measurement & verification of energy savings</p> 
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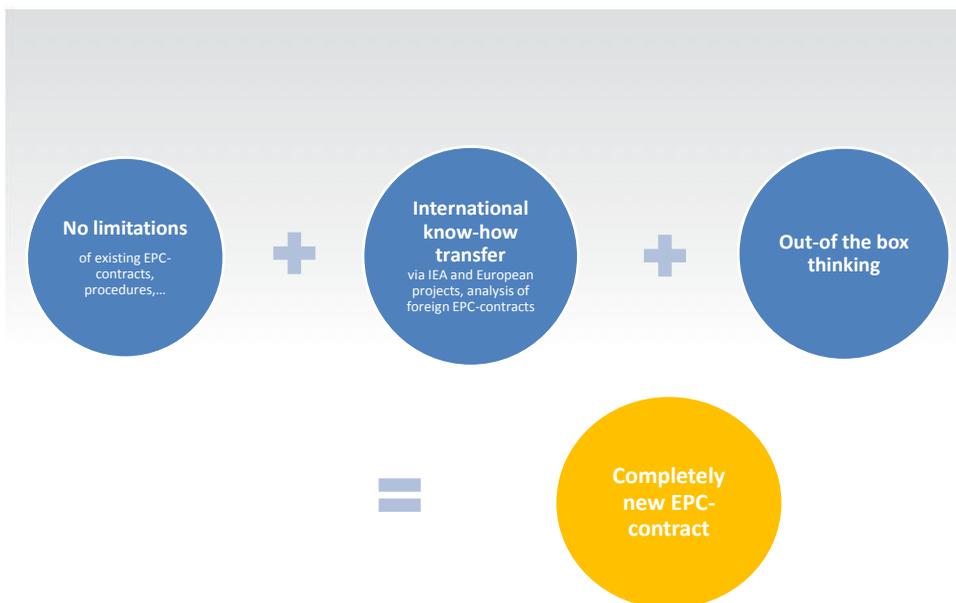
General

Project	Objective	Pilot EPC projects
<p>Transparense</p>  <p>www.transparense.eu/be</p>	<p>Increasing professionalism and transparency of ESCo industry, including EPC Code of Conduct</p>	<p>city of Ghent</p>
<p>EESI 2020</p>  <p>www.eesi2020.eu/be</p>	<p>Promotion of EPC and EPC-facilitation in Europe</p>	<p>city of Antwerp</p>



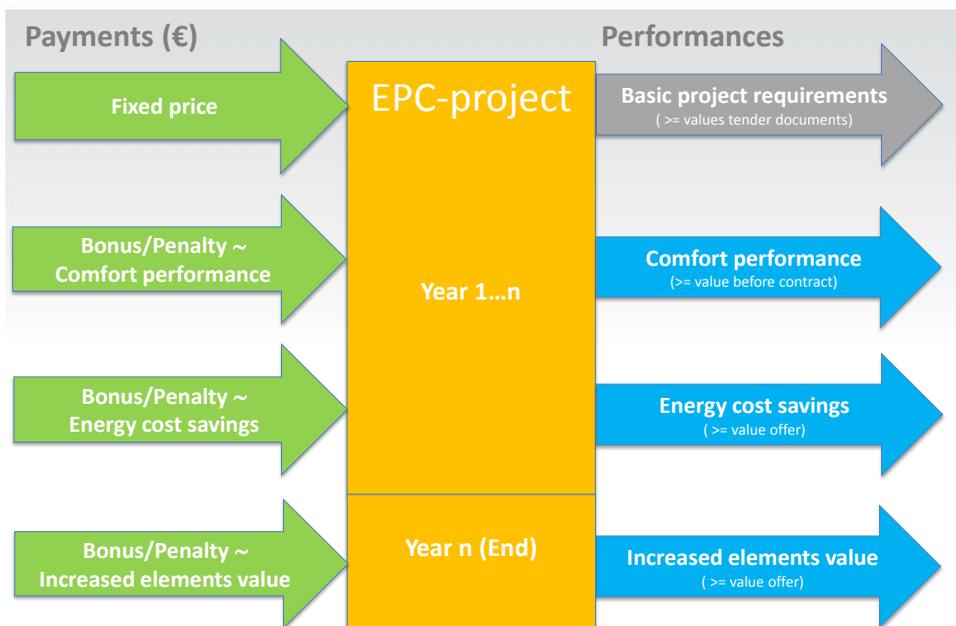
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General concept Belgian EPC-contract



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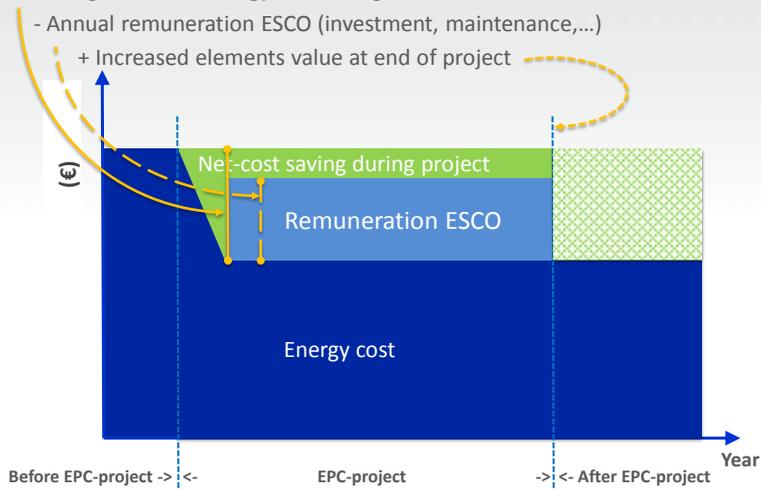




Selection criterion ESCO

Maximal net-cost saving = actualised value of:

- + Annual guaranteed energy cost savings
- Annual remuneration ESCO (investment, maintenance,...)
- + Increased elements value at end of project



During project

✓ Payment ESCO = Fixed price + Bonus/Penalties

where Bonus/Penalties ~

- comfortscore,
- energy saving
- increased elements value at end project

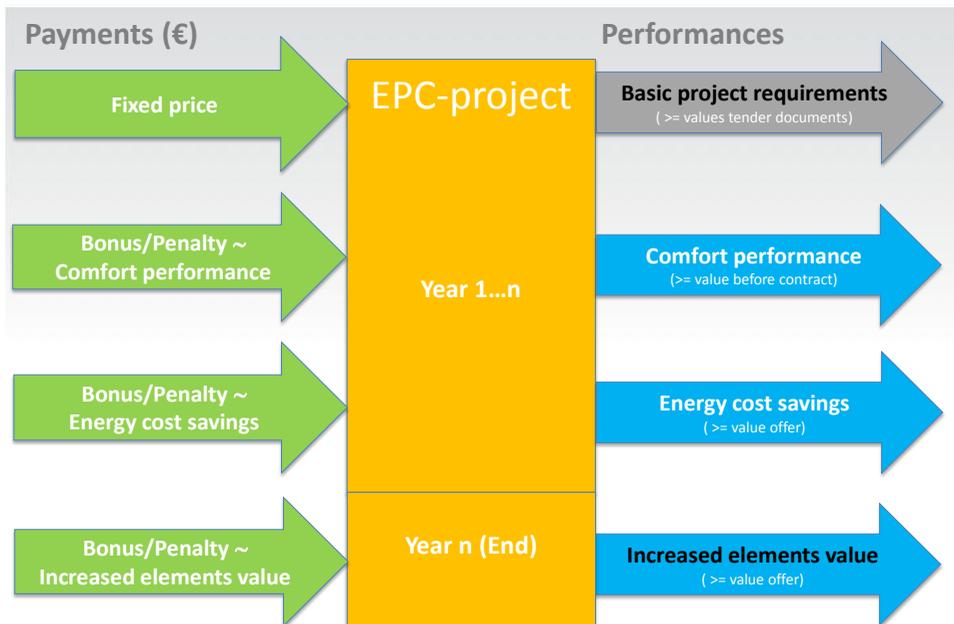
✓ ESCO: maximal decision autonomy

as long as basic project requirements are fulfilled :
functionality, safety, legal standards, etc.



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Optimal maintenance



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Optimal maintenance

ESCO 100% technical responsible for whole building

- Installation: HVAC, lighting, elevators, alarm systems, sanitary equipment, tubes, cables,....
- Building envelope: windows, solar protection, roof, gutters,...

ESCO 100% financially responsible

- During project: fixed price for maintenance&replacement costs
- End of project: increased elements value
elements value (EUR)
 - ~ Maintenance condition of elements (evaluation via Dutch norm NEN 2767)
 - ~ Price of the new element



Optimal maintenance

Advantages

✓ ESCO will **minimise long term building cost**, e.g.

More focus on preventive maintenance and measures with long technical lifetime (high quality equipment,...), as...

- Cost future replacement investments in project ↘
- Increased elements value at end ↗

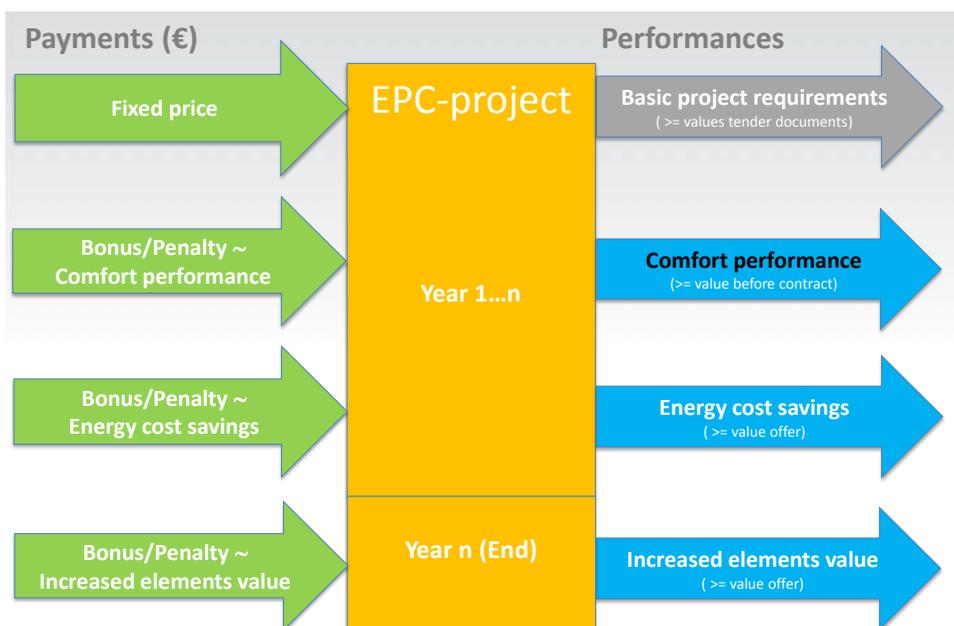
✓ ESCO 100% responsible, **less follow-up cost by building owner**, e.g.

No input control required of maintenance

No 'discussions' about necessity replacement investments



Optimal comfort





Conventional EPC-contract

For each building/space:

- Space temperature in summer: <math><26^{\circ}\text{C}</math>
- Relative humidity >40%
- Illuminance level >500 lux
- ...

Disadvantages

Low reliability

- Methodological problems
e.g. Measured summer comfort ~ outside temperature measurement period
- Critical comfort aspects not valued
e.g. Customer-friendliness of ESCO, user control HVAC,...
- Non-critical comfort aspects overvalued
e.g. comfort 300 lux = comfort 500 lux



Disadvantages (continued)

No incentive to perform better

Low cost efficiency because....

- Expensive measurement/logging campaigns
 - 5-10k incl. reporting (<-> 1,5k via Comfortmeter incl. reporting)
- Inflexible/hard targets
 - e.g. with same cost much higher overall comfort possible by
 - Underperforming comfort target x
 - Over performing comfort target y



Optimal comfort

Comfortmeter Step 4 of 11

Comfort: air

The air is never too dry in my workspace Completely disagree Completely agree

The air is never stuffy or with an odour in my workspace Completely disagree Completely agree

How satisfied are you with the general air quality in your workspace, i.e. dry/stuffy air, air with an odour, cleanliness? Very dissatisfied Very satisfied

Additional remarks related to air quality:

◀ Previous step: temperature Next step: light ▶

Via online comfort survey tool: www.comfortmeter.eu

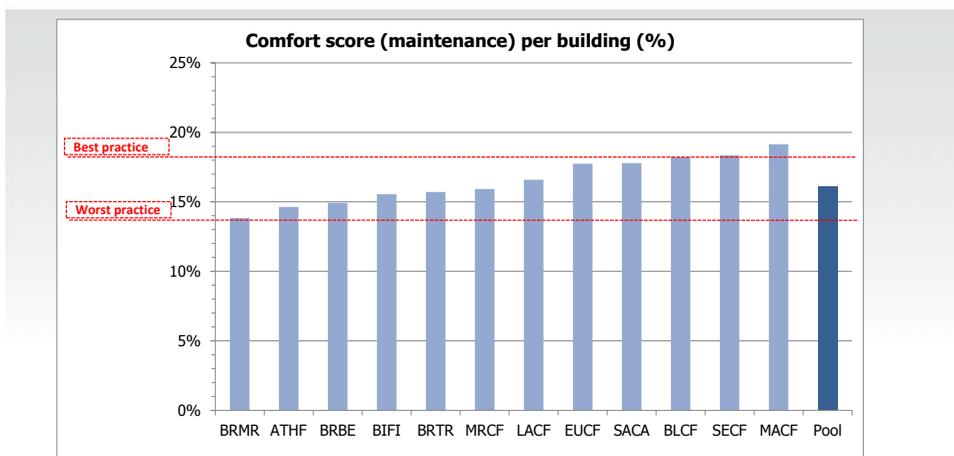
Time: ± 40 respondents every 3 years,

55 questions, 11 themes, 10'/respondent

± 55% resposns



Optimal comfort



Comfortscore +1% -> 0,2% productivity increase

e.g. Potential improvement comfort score by ESCO in ATHF = +3,2%

⇒ employee productivity increase = + 90.000 €/year

>>> energy saving potential in ATHF = + 9.000 €/year !



Advantages new EPC-contract

- ESCO more focused on higher comfort and **employee satisfaction**
When surveyed comfortscore ↗
 - ⇒ Bonus ESCO ↗
 - ⇒ Reputation ESCO ↗
 - (and vice versa...)
- Performance based **deep retrofitting** of buildings with major comfort problems (e.g. Sick Building Syndrome)
- **Minimal comfort guaranteed** via conventional comfort requirements (=backup)
- **Lower cost**
 - Cost comfort ↘ as ESCO will financially optimise
 - Cost comfortmeter surveys < comfort logging temperature etc.



The best of both worlds....

Specialised expertise ESCO

+

The same motivation as building user/owner



Building cost ^(a) ↘

Comfort and employee satisfaction ↗

(a) = energy + maintenance + investment



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