



**DEEP ENERGY RETROFIT &
ENERGY PERFORMANCE
CONTRACTING:
THE BELGIAN EXPERIENCE**

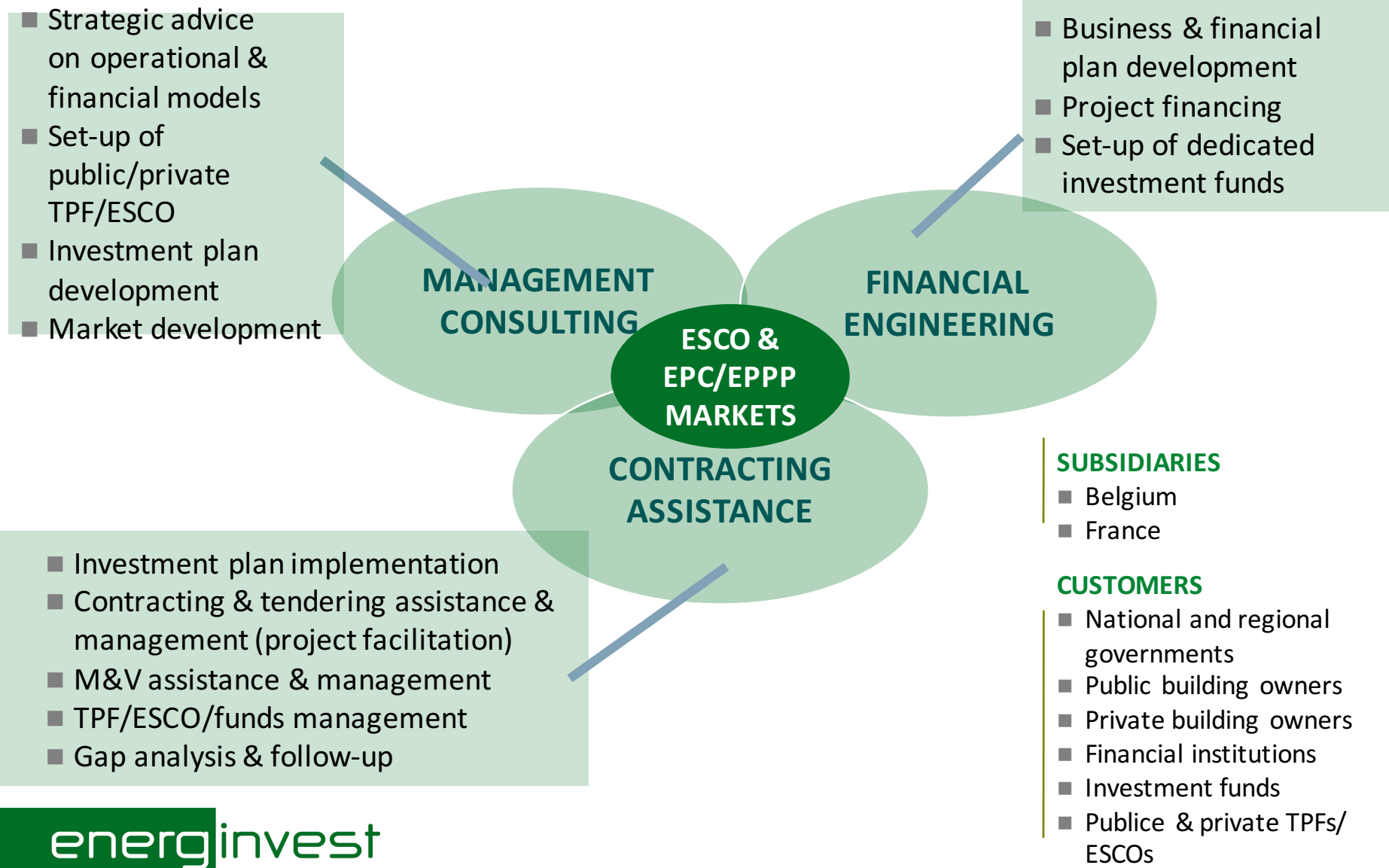
**ANNEX 61 TECHNICAL DAY
10 JULY 2013**

**LIEVEN VANSTRAELEN
CO-CEO & OWNER**



How deep will it go?

> A EUROPEAN CONSULTING FIRM AND SERVICES PROVIDER, SPECIALIZED IN ESCO & EPC/EPPP MARKETS



> HOW MUCH ENERGY SAVINGS CAN PAY FOR THEMSELVES?

Energy savings alone (could) pay for themselves to reach target *

**GRENELLE
2020
(40%*)**

Investment funding amounts to 130 Billions € with 60-70 Billions € in EPC/EPPP

* Energy consumption

Need to implement a multi-year/technical investment plan with appropriate structure

* Rhones-Alpes simulation based on 60 public buildings including schools, offices, hospital and social housing.

Energy savings alone do not allow to reach target *

To reach 50-75% energy reduction rate, additional funding is needed (30-50%)*

**GRENELLE
2050
(75%*)**

EPC & emerging EPPP market practices have a limited role regarding large refurbishing

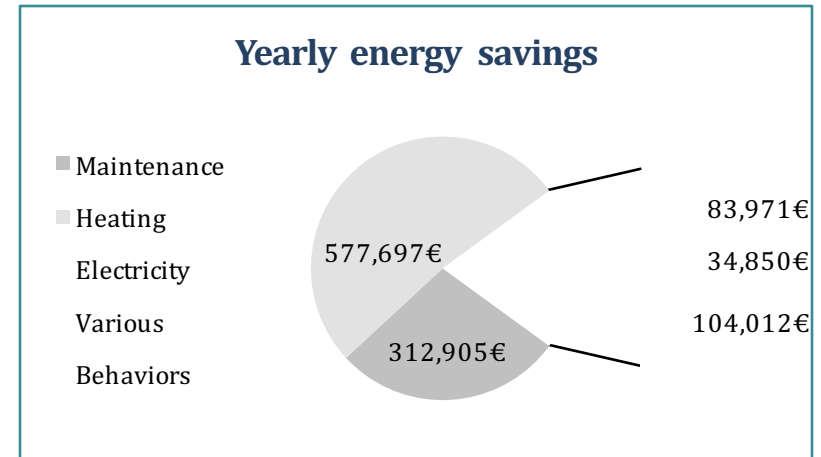
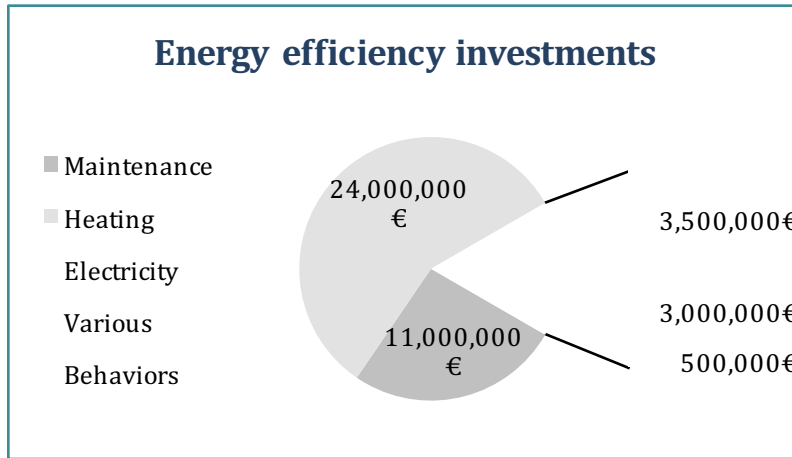
* Energy consumption

Need for new financial/operational models: public-private TPFs/funds, public TPFs/funds

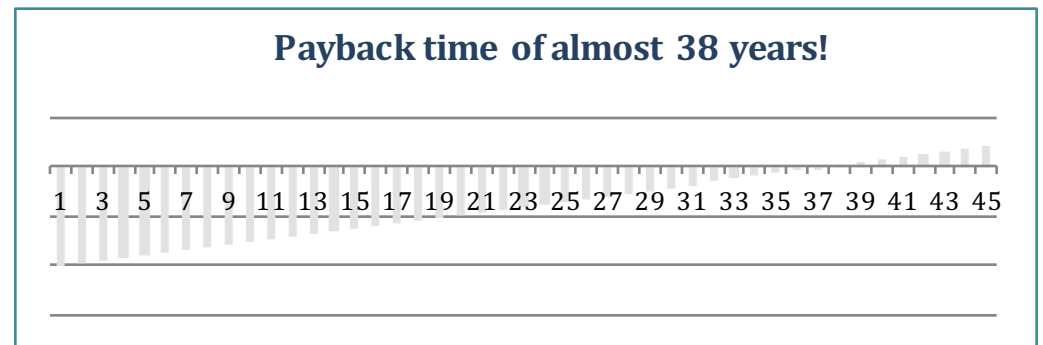
* CDC simulation based on 15 public buildings including schools, offices, hospital and social housing.

> FINANCING FACTOR 4 IN PUBLIC BUILDINGS: CASE STUDY RHÔNES-ALPES

60 PUBLIC BUILDINGS
280.000 m2 (SHON)
73 GWhep/year
260 kWhep/m2/year
3 millions €/year

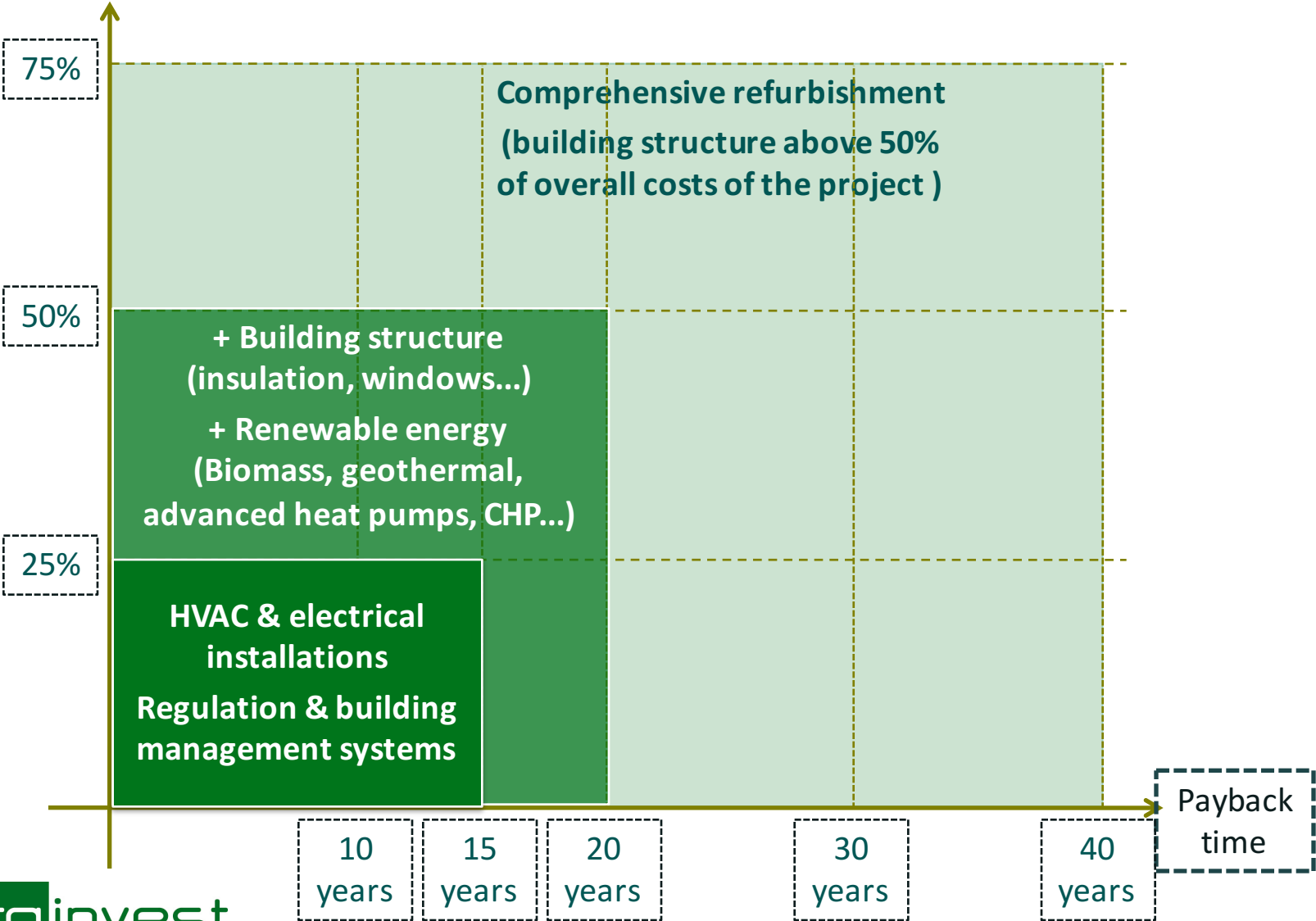


42 millions € investment
1,14 million € savings/year
-38% energy consumption
-60% GHG emissions

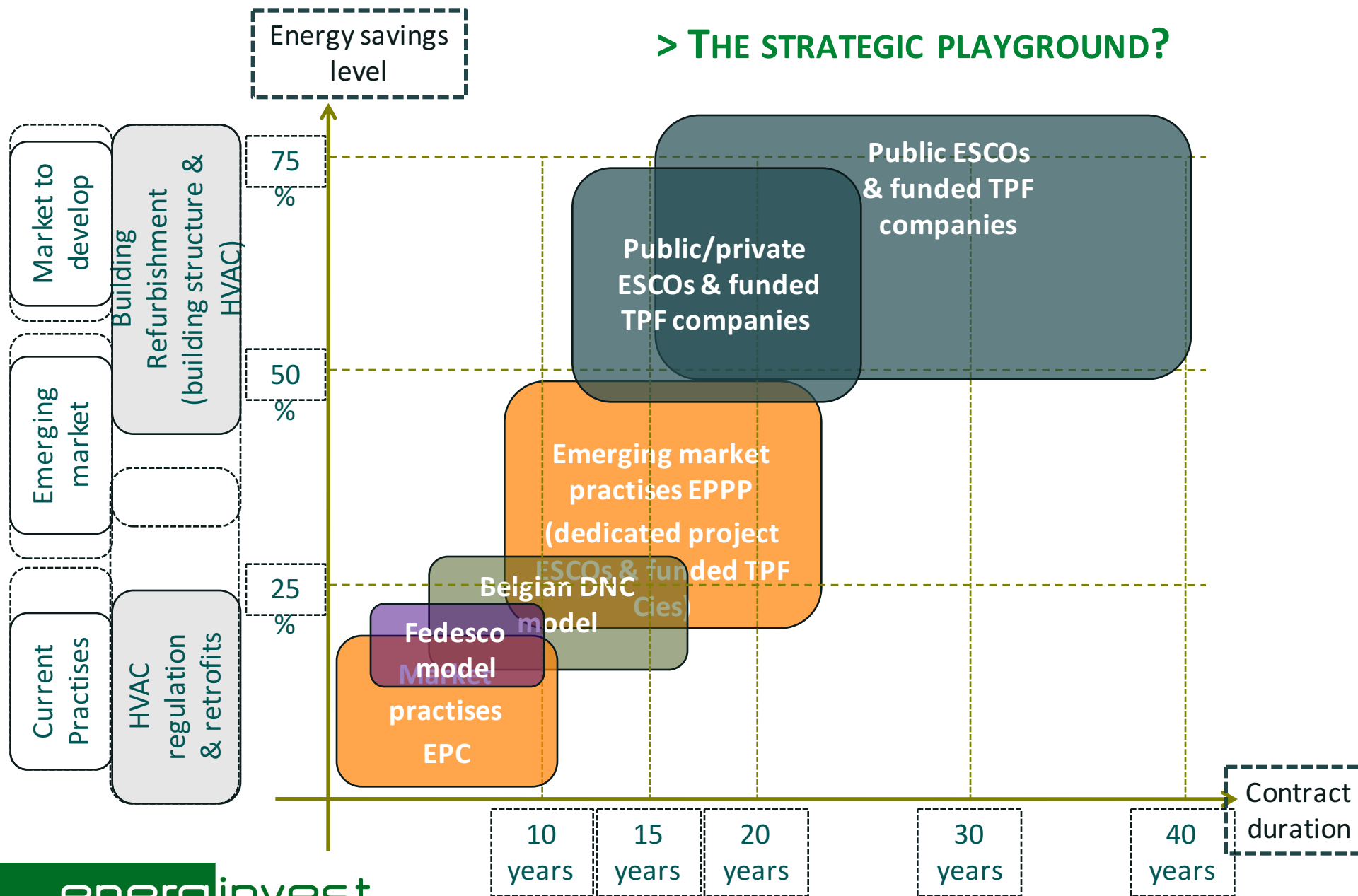


Energy savings level

> THE STRATEGIC PLAYGROUND?



> THE STRATEGIC PLAYGROUND?



The Belgian ESCO & EPC Market

- < 2005
 - A few not so very successful attempts for EPC
- > 2006
 - Emergence of **Fedesco**, one of the first national public ESCO's in Europe
 - Initially with “program method”, now with EPC
 - Implementing a 150 million € investment program in federal buildings
- 2008
 - Start of Fedesco knowhow transfer > Led to the creation of the Fedesco **Knowledge Center** (acting today as EPC project facilitator)
- 2010
 - Creation of **BELESCO**, the Belgian ESCO Association
- 2011
 - Start of development of the “**smartEPC**” model
- 2012-2013
 - Increase in EPC projects emerging

Some of the issues with EPC & Deep energy retrofit

- Who wants to sign a contract for 30 years anyway?
- How to guarantee and measure energy savings & quality of comfort?
- How to assure the performance of overall maintenance of the installations and the building?
- How to stimulate deep retrofit measures, without becoming input rather than output driven?
- How to disconnect PBT from contract duration?
- How to assure return to customer by ESCO of installations and buildings of sufficient quality at the end of the contract

Origin of smartEPC

> **Pilot project in 11 Belgian federal public buildings**

> **Stakeholders =**

- Tenant & facility manager: federal Building Agency
- Occupant: mainly Finance FPS
- Owner: real estate company 'Fedimmo' (Befimmo)
- Facilitator & TPFCo: Fedesco

Following specific stakeholder needs:

- ✓ **not all buildings** in the pool **until the end**
- ✓ include **overall maintenance** (more than only maintenance of energy saving measures)
- ✓ optimal **comfort**
- ✓ manage complex **legal and organisational context**
- ✓ easy and cheap **large scale reproducibility** afterwards in other pools

Why a new contract?

> **Existing EPC or maintenance contracts turned did not fit the needs**

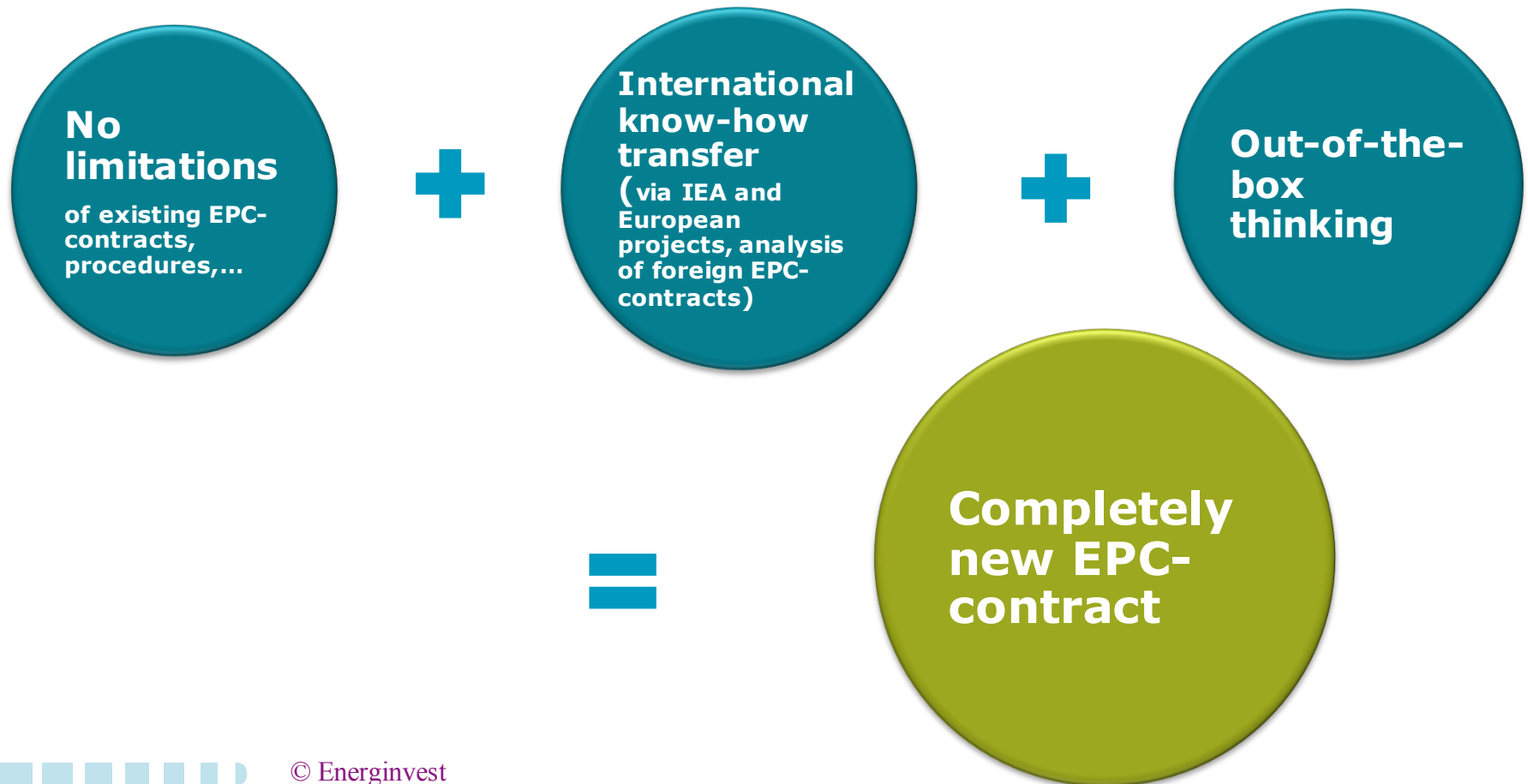
- Often older contracts (designed in the '90 and '00)
- Often adapted to national practices, context, legislation and public tendering law
- Often complex through evolution and numerous changes throughout the years
- Or too simple
- We wanted to integrate the role of the EPC facilitator (and of a third party mediator)
- We needed a toolbox, not just a contract

Why a new model?

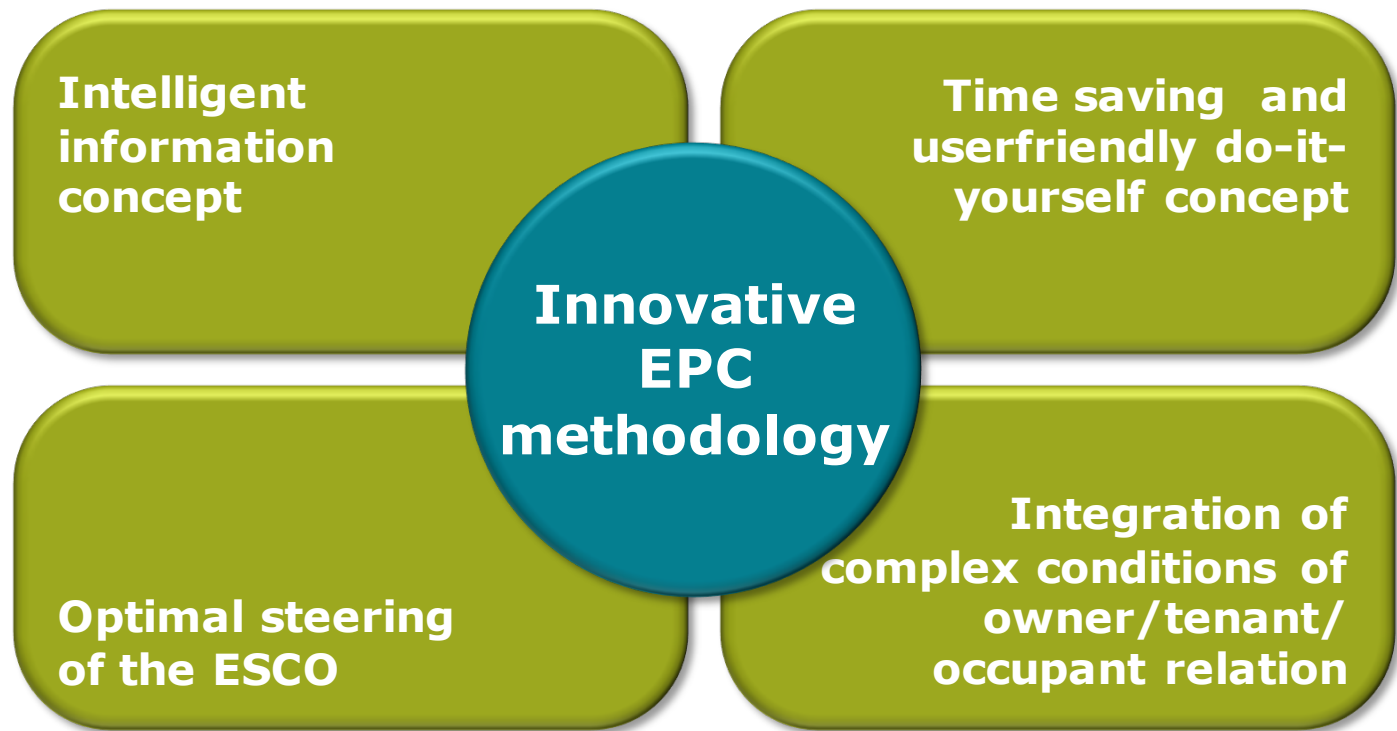
> **Existing EPC models did not meet stakeholders' requests**

- Focused mainly on energy performance
- Maintenance issues
 - > Use of classic "input-driven" maintenance
 - > Conflict with existing maintenance plans
- Little attention to Non Energy Benefits
 - > User Comfort
 - > Health & productivity
- No solution for "owner/tenant" split-incentive
- Limited means to stimulate financial savings after or during the contract
- Complex award criteria with insufficient drivers for global financial optimization by the ESCO

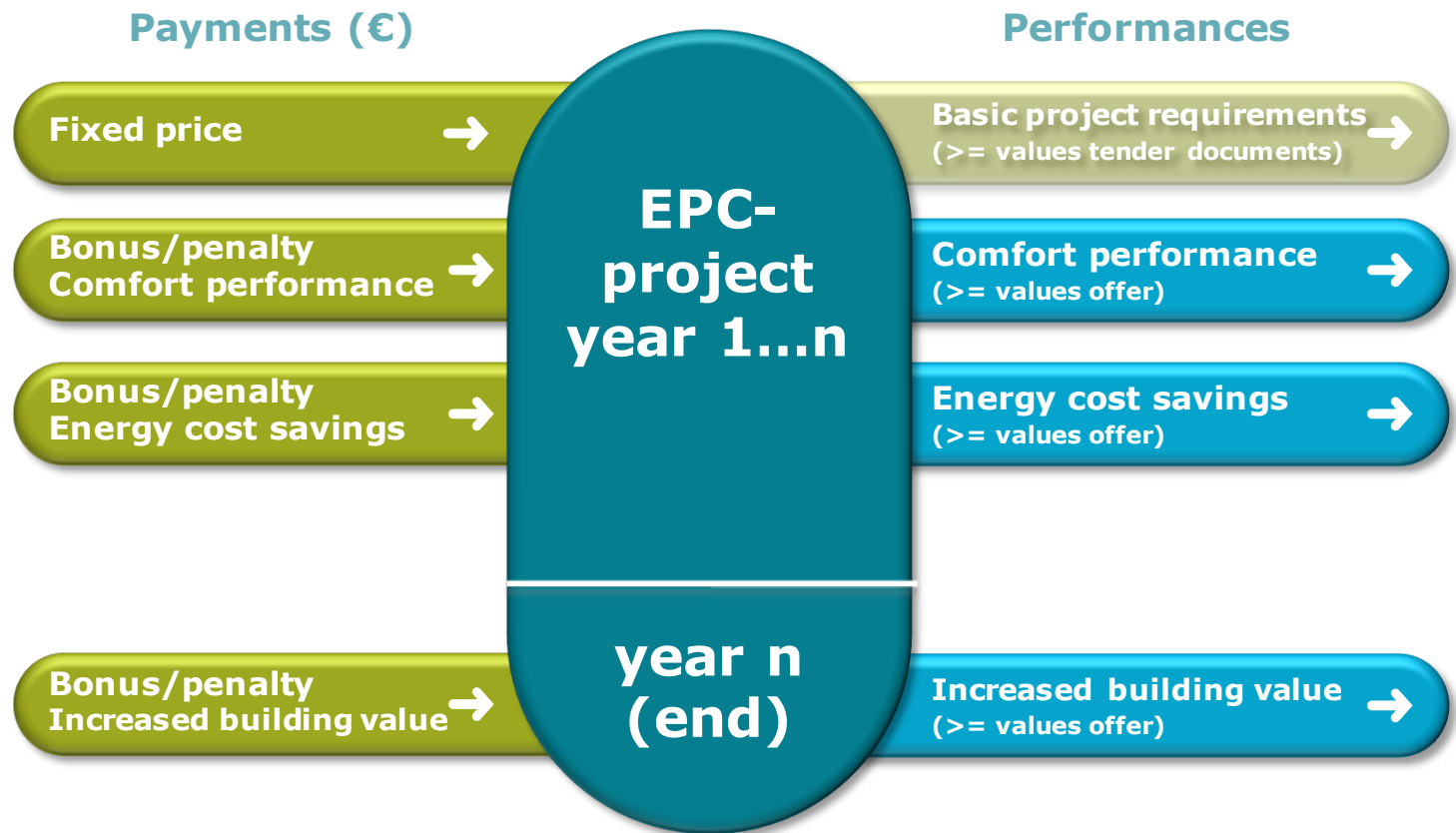
The road to this new model



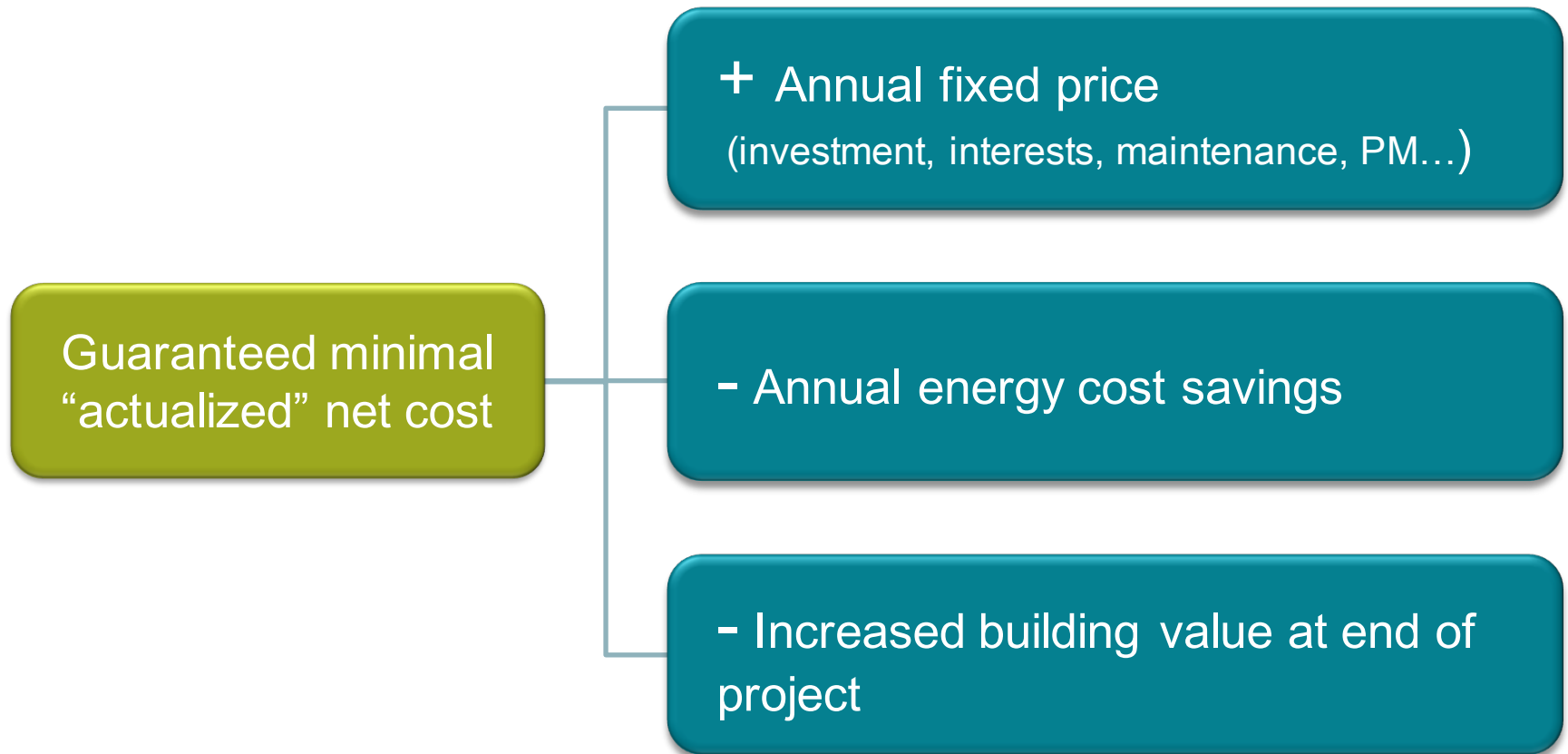
Key design principles



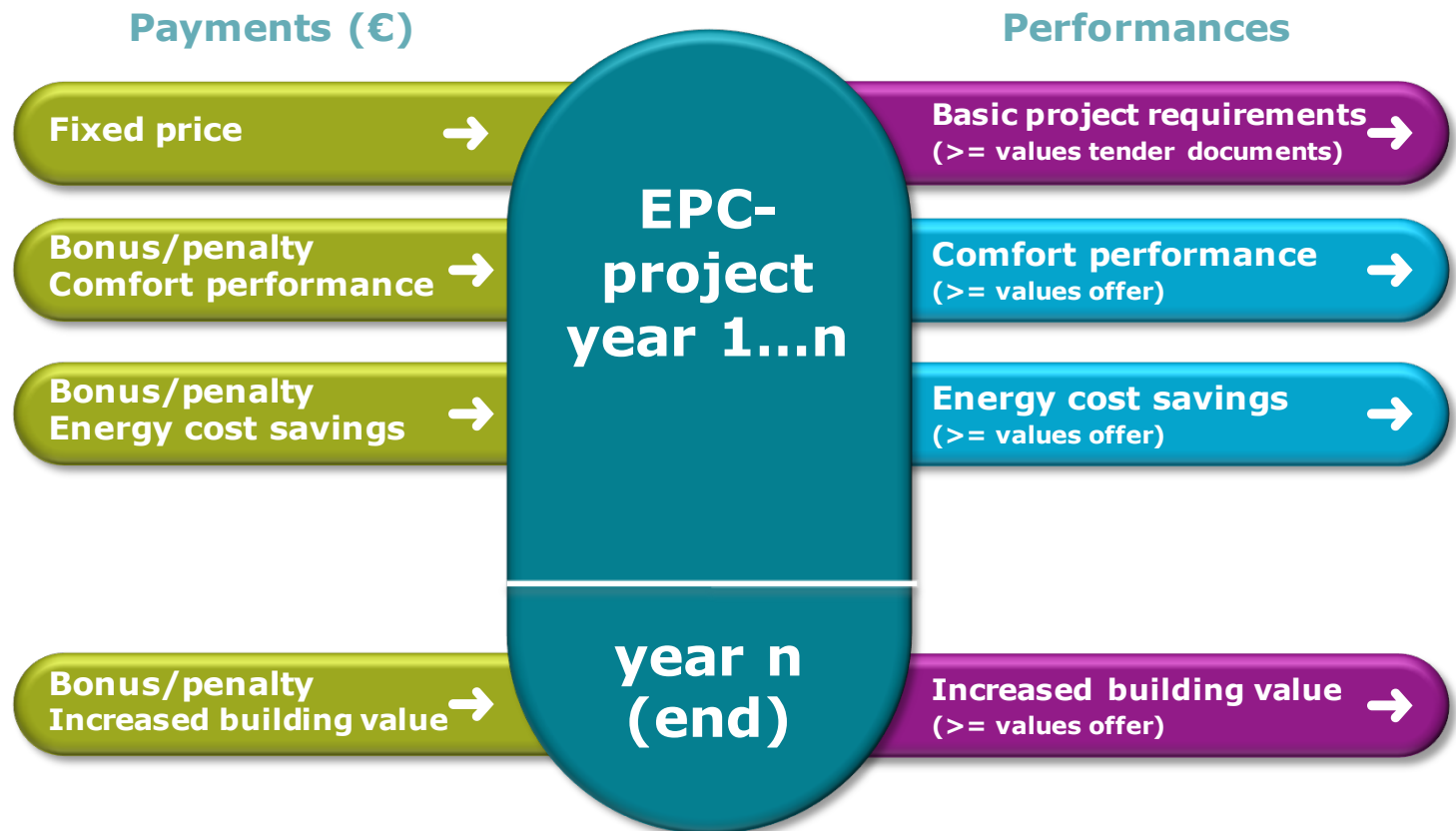
Basics



Main quantitative award criterion



Zooming in on optimal maintenance



Performance based maintenance

(we use NEN 2767 but can be another similar scheme)

1 = nieuwbouw kwaliteit

2 = goed

3 = redelijk

4 = matig

5 = slecht

6 = zeer slecht

8 = nader onderzoek nodig

9 = niet te inspecteren

NEN 2767

The screenshot displays the O-Prognose software interface. The main window shows a list of elements for '22.00076.Lambrm - Rue Lambermont 2'. The 'Handelingen' (Actions) tab is active, showing a table of actions and their associated defect codes.

Handeling	Gebrek	Hier
Nettoyer	Uitwendige vervuiling	100
Vervangen voorraadboilers		101
Herstellen voorraadboilers		102

A dialog box titled 'Conditiemeting | CO2 Stooktoestellen voor warmteopwekking' is open, prompting the user to 'Selecteer een gebrek uit de lijst' (Select a defect from the list). The dialog lists various defects categorized by severity:

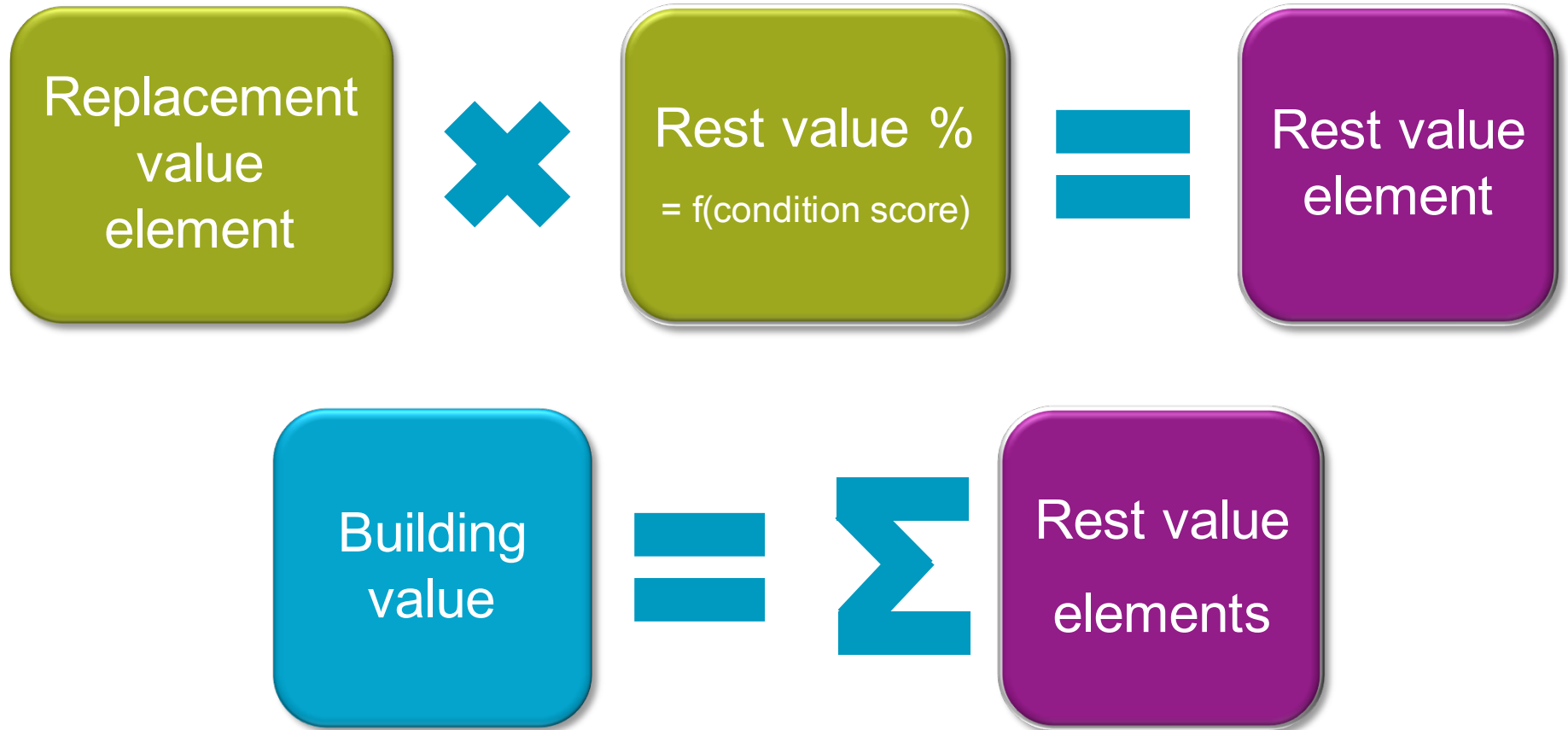
- Ernstige gebreken (Serious defects):** 1 Inwendige corrosie aan frame en plaatswerken (K2EM01), 1 Gaten of barsten in keteldelen (K2EC01), 1 Plaatselijke oververhitting van ketelmantel/front (K2EM03), 1 Inwendige corrosie aan keteldelen/romp (K2EM02), 1 Uitgedroogde of bros geworden brandstofleiding (K2EM04), 1 Onbalans/trillen ventilatorbrander (K2EW01).
- Serieuze gebreken (Serious defects):** 2 Lekkage keteldeel/romp niet door corrosie (K2SW01), 2 Beschadiging (deuken) (K2SC01), 2 Lekkage waterzijdige aansluiting (K2SW02), 2 Lekkage brandstofaansluiting (K2SW03), 2 Vervangende onderdelen niet meer verkrijgbaar (K2SB01), 2 Beschadigde ketelisolatie (K2SC02).
- Geringe gebreken (Minor defects):** 3 Verval tussen 50%-75% van de levensduur (K2GV01), 3 Beschadigde of ontbreken van bevestigingsmiddelen (K2GB01), 3 Verval meer dan 75% van de levensduur (K2GA02), 3 Beschadiging of ondeugelijke doorvoering van elektris... (K2GA01), 3 Beschadiging (krassen) (K2GA01), 3 Verontreiniging verbrandingsruimte of branderbed (K2GO02), 3 Geen periodieke PI/EBI uitgevoerd (K2GO01), 3 Uitwendige vervuiling (K2GO04).

The dialog also includes a 'Volgende' (Next) button and an 'Annuleren' (Cancel) button.

How to calculate building value?

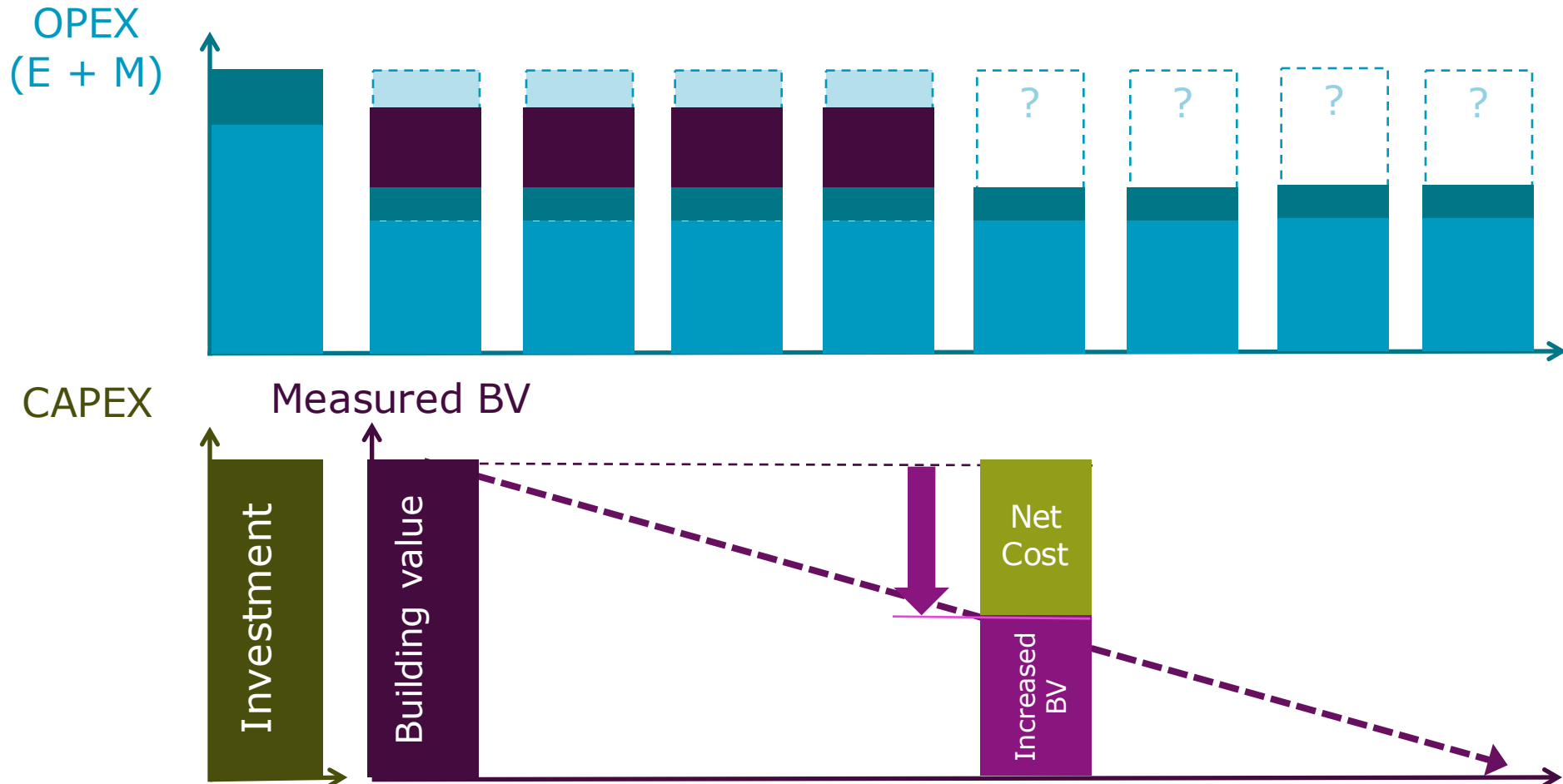
Id	Element	Locatie	Hoeveelheid	Eenheid	Vervangingswaarde	Conditie score	Restwaarde %	Restwaarde
...								
20-100	Regelkasten;3-4 regelringen regelkast	Kelder	1	stuk	2.000	3	25%	500
20-101	Warmtedistributie;water;convectors met thermostaatkraan	Niveau 0	127	stuk	6.500	2	50%	3.250
20-102	Warmtedistributie;water;radiatoren met kraan	Niveau 1	135	stuk	7.000	2	50%	3.500
20-103	Luchtbehandeling;lokale mechanische ventilatie;dakventilator	Dak	5	stuk	3.500	6	3%	105
...								
	TOTAAL				5.200.000	2,8	30%	1.520.00

Building value



What's the importance of BV?

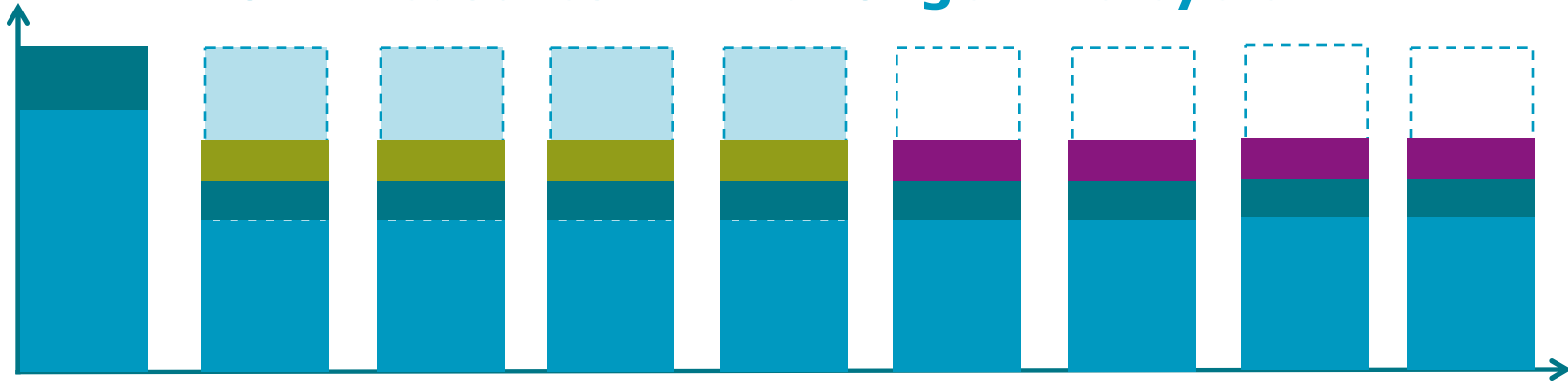
> Financial savings after the contract



What's the importance of BV?

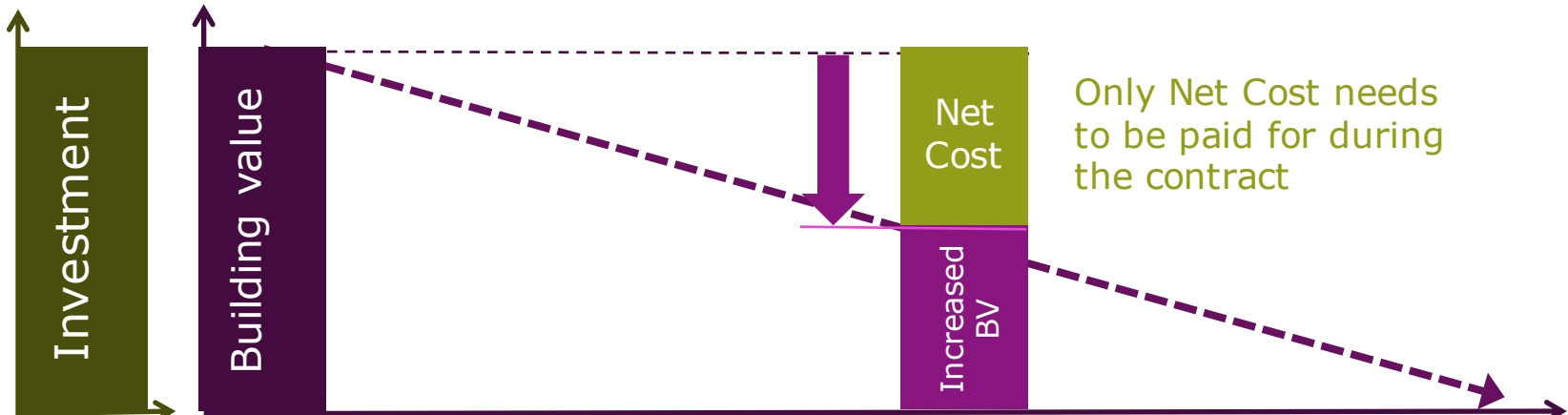
> The financial savings after the contract come from measures with a longer life cycle

OPEX
(E + M)



CAPEX

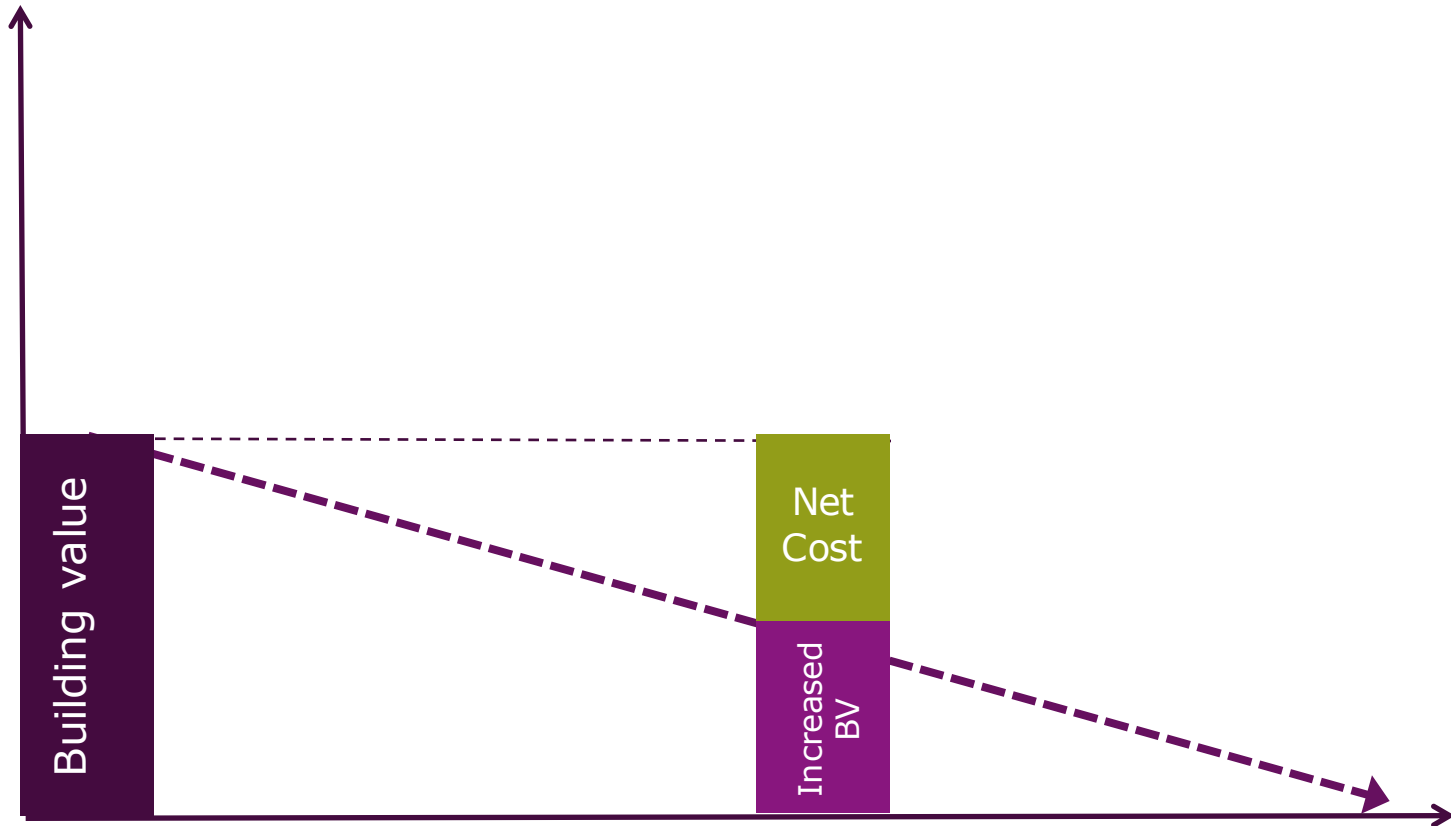
Measured BV



Only Net Cost needs to be paid for during the contract

This can stimulate “deep renovation”

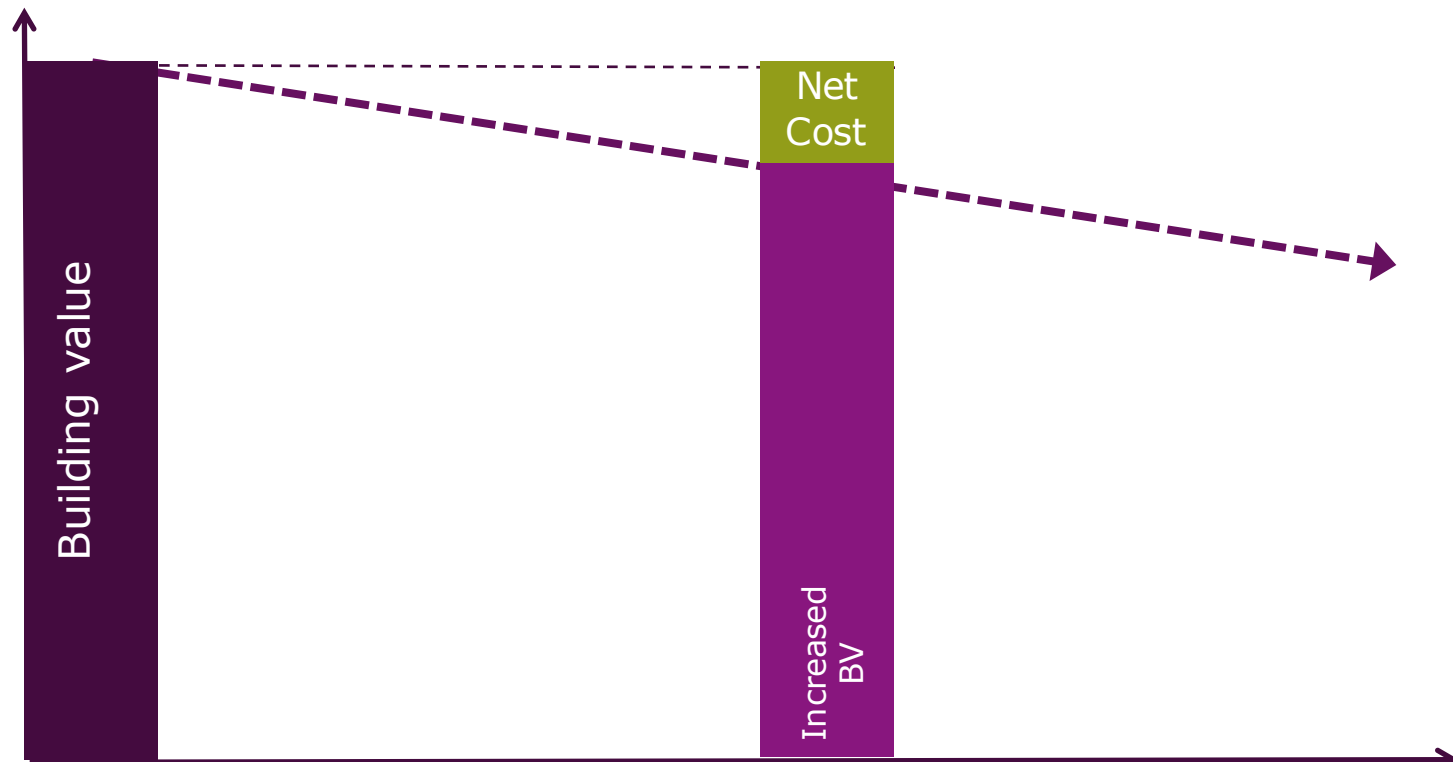
Measured BV



In particular “measures” whose condition scores stay high

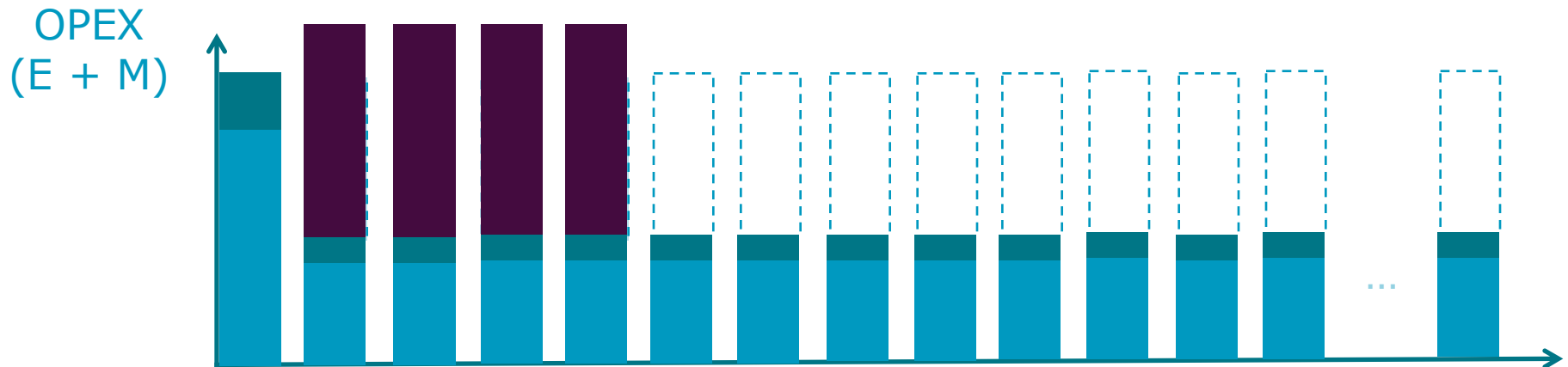
- > **Higher increased Building Value (with low Net Cost) to deliver high savings after the contract**

Measured BV



For more kWh, CO₂ & € savings

> without having to increase the duration of the contract



Conclusion

smartEPC-contract generates new EPC opportunities

- > **Buildings that have to leave pool earlier**
 - e.g. pool 10 years, exit building A after 5 years
- > **Buildings where owner ≠ tenant**
- > **Performance based deep energy retrofitting**
 - incl. insulation measures...
- > **Performance based retrofitting of buildings with major comfort problems**
 - e.g. Sick Building Syndrome
- > **Replacement of conventional maintenance contracts**

Ongoing & planned smartEPC projects



> **Fedimmo**

- 11 federal buildings

> **City of Ostend**

- 6 municipal buildings

> **Province of Brabant Walloon**

- <158 provincial buildings on 30 sites

> **2 EU pilot projects in major Belgian cities**

What is smartEPC?

- > **A “TOTAL CONCEPT” for EPC projects**
 - Integrating the EPC project facilitator role
- > **An innovative MODEL for Energy, Maintenance and Comfort Performance Contracting**
 - A 100% performance driven technical, operational, financial and organizational model
- > **A highly standardized and quality driven CONTRACT and set of TENDERING DOCUMENTS, plus annexes**
 - Public version is compatible with public tendering law
 - Using a “licence” model for optimized contract transaction cost
- > **A TOOL for financing long term investments in energy efficiency and building value**
- > **A BRAND**
 - around which to build a hopefully growing community of customers, facilitators and ESCOs



smart epcSM



energinvest

THANK YOU FOR YOUR ATTENTION

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Belgium



energinvest helpt u verder te zien

De eerste bron van financiering van uw energiebesparende maatregelen zijn de energiebesparingen zelf ! Op het niveau van een gebouwenpark kunnen ze een cash flow genereren voor de financiering van een factor 2, oftewel 50% reductie van de uitstoot van broeikasgassen. En u? Kent u het onbenutte potentieel van uw gebouwenpatrimonium? Als adviesbedrijf voor financiële engineering, helpt Energinvest u bij de realisatie van de energetische retrofit van uw gebouwen.

Uw partner voor energetische gebouwenrenovatie

energinvest

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STRATEGISCH ADVIES
FINANCIËLE ENGINEERING
PROJECT MANAGEMENT

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