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“Energising Valuation in Europe” – How does cost of energy affect your Real Estate Business

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Intelligent Energy



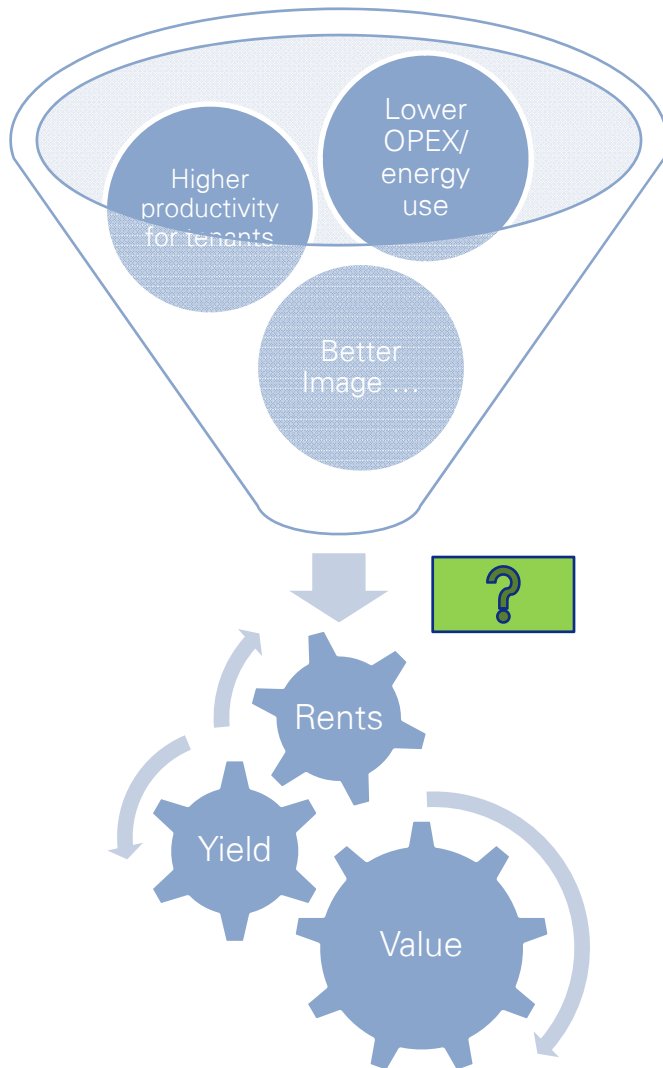
Europe



- A **Green Building** is a property that uses resources efficiently, reduce waste and CO2 emission, provide superior indoor air and other qualities, and avoid negative social impacts.
- **Energy efficiency** is therefore part of the various green building features.
- A **Green Value** is the net value added obtainable by a green property in the market compared to a non-green peer group.
- According to the definitions of green and market value it can be assumed that the green value is an **integral part of the overall market value.**

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What does a green building promise?



In US-Numbers (here LEED)...

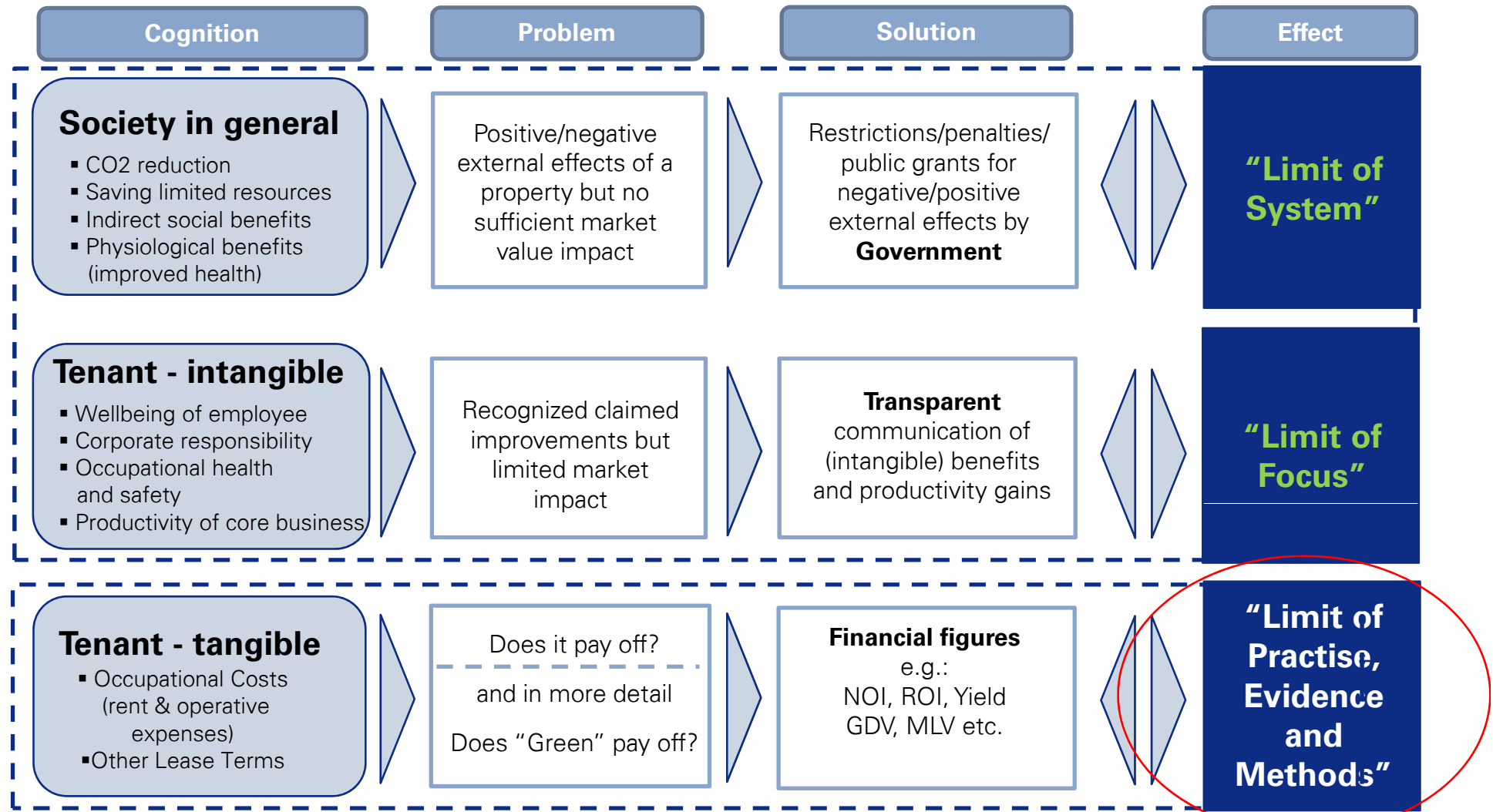


- 8-9 % Decrease of operating expenses
- 7,5 % Increase of the current market value
- 6,6 % Increase of the ROI
- 3,5 % Increase of the occupancy rate
- 3 % Increase of rent

Source: U.S. Green Building Council, Date: 15.04.2008

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Integration of green attributes – three major obstacles (Or why markets failed)



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Some basic answer!

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- 1** Could there be a general premium / discount rule ? **NO**
(due to willingness to pay)
- 2** Do we need new valuation methods? **NO**
(since existing tools can display everything)
- 3** Could there be a pan-European approach/guidance to these aspects? **YES**
(since the fundamental challenge is the same)
- 4** Should we distinguish between developed and less transparent markets? **YES**
(since data input is required for proper calculation)
- 5** Do we also need to revise report structures accordingly? **YES**
(since the aspects need to be addressed in the text)
- 6** Since in principle things are not new. Are there already valuers who handle this aspect in the right way? **NO**
(since some training will be necessary for everyone)

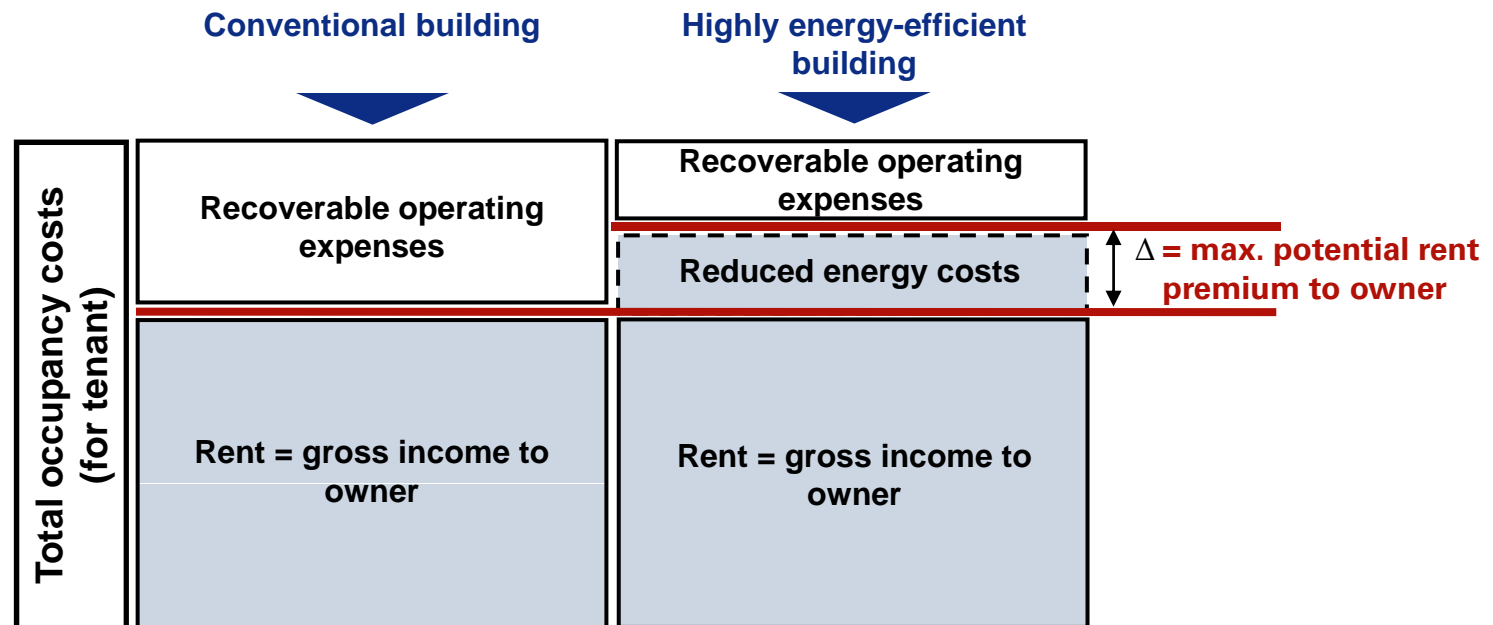
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Published empirical research results on green value

Variable	Country	USA (Mc Graw, Hill Construction 2005)	USA (Mc Graw, Hill Construction 2008)	USA (Miller et al. 2008, using CoStar Database)	USA (Fürst, McAllister, 2008, using CoStar Database)	USA (Eichholtz et al. 2009, using CoStar Database)	Australia (Bowman, Willis 2008)
Rental Growth for non-Green		-	-	-	-	-	-1.50%
Rent Premium for Green		3.00%	6.10%	-	-	3.00%	X
Energy Star		-	-	2.80%	-	-	
LEED		-	-	0.30%	-	-	
Energy Star/LEED		-	-	-	11.80%	-	
Effective Rent		-	-	-	-	6.00%	-
Decrease Operating Expenses		8.00-9.00%	13.60%	-	-	-	-
Reduction cap rate		-	-	-	-	-	0.25-0.50%
Improved ROI		6.60%	9.90%	-	-	-	-
Increase occupancy ratio		3.50%	6.40%	-	-	-	-
Market value		7.50%	10.90%	-	-	-	-
Selling price		-	-	-	-	16.00%	X
Energy Star		-	-	5.76%	10.00%	-	
LEED		-	-	9.94%	31.00%	-	
Energy Star/LEED		-	-	-	11.40%	-	

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Theoretical potential rent premium



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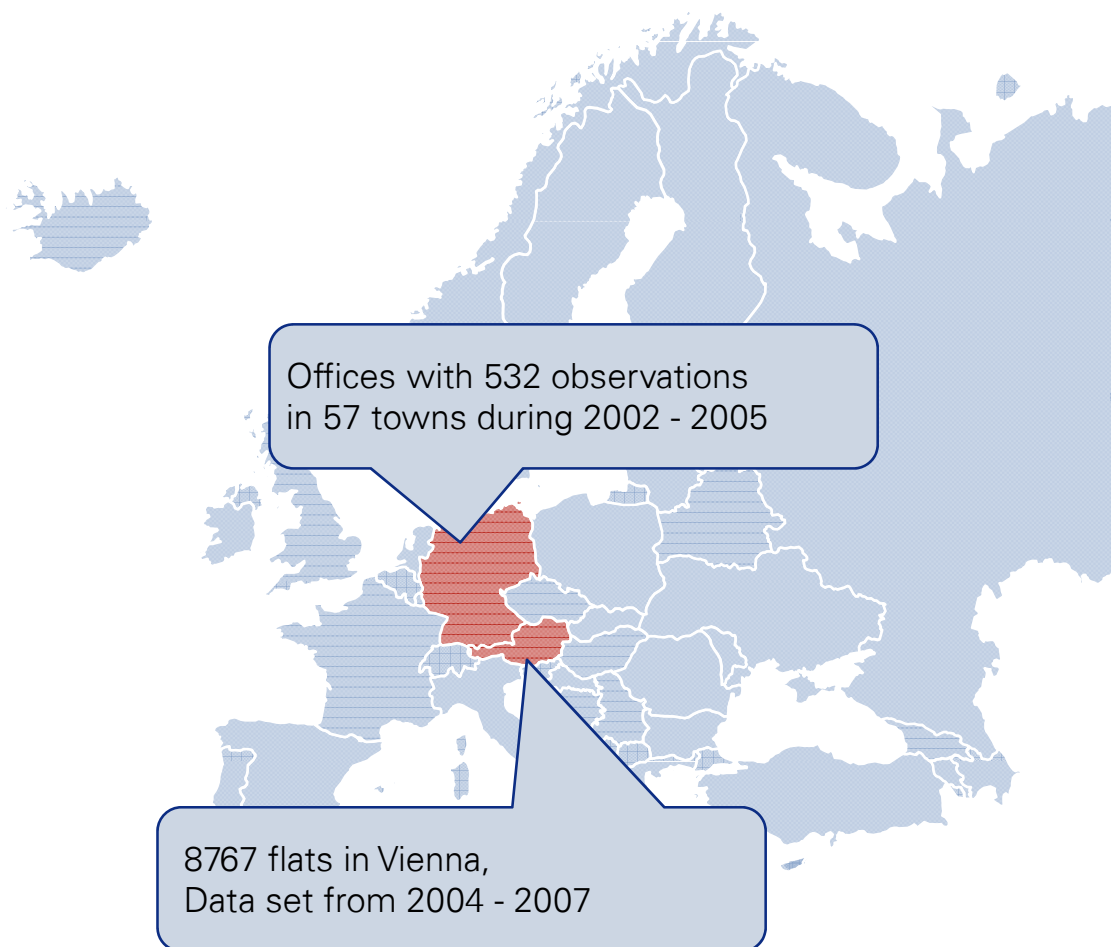
European research projects with focus on Green Value integration

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- 1 **International EU-project „IMMOVALUE“** – Integration of energy performance certificates and LCC into property valuation practice
- 2 **Austrian national project „Neue Immostandards“** – Integration of energy efficiency into property valuation
- 3 **Swiss project “Economic Sustainability Indicator (ESI)”** – Approach for integration of sustainability aspects within capitalisation rates (yields)
- 4 **RICS Valuation Information Paper No. 13** – Guidance for sustainability and commercial property valuation
- 5 **Planned TEGoVA Guidance Notes** – Guidance for integration of sustainability aspects within property valuation
- 6 **„Ecological rent table,, for Darmstadt (Germany) of IWU** (Institut für Wohnen und Umwelt Darmstadt)

Intelligent Energy Europe





- 1 The „hard“ way: using advanced methods!
- 2 Question at the beginning: can a single valuer ever perform this for every valuation? - **NO**
- 3 Aim: Finding the proof for the connection between lower energy cost and higher rents
- 4 Log-Log and Log-Lin model
- 5 Semiparametric model / P(enalized)-splines (PLS)
- 6 Geoadditive model / Spatial effects

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German data set analysis – results (simple regression)

$$\ln(\text{rent_psqm}) = \beta_0 + \beta_1 \text{quality_h} + \beta_2 \text{quality_m} + \beta_3 \text{elev} + \beta_4 \text{full_air} \\ + \beta_5 \text{part_air} + \beta_6 \text{age} + \sum_{i=7}^{10} \beta_i \text{year}_i + \sum_{j=11}^{31} \beta_j \text{city_no}_j \\ + \beta_{32} \ln(\text{ngf}) + \beta_{33} \ln(\text{maint_psqm}) + \beta_{34} \ln(\text{energy_psqm}) + \beta_{35} \ln(\text{other_psqm}) + \mathbf{u}$$

Linear Model

Number of obs	532
F(33, 498)	10.58
Prob > F	0.0000
R-squared	0.4121
Adj R-squared	0.3732
Root MSE	0.3115

logrent_psqm	Coef.	Std. Err.	t	P> t
_cons	2.615	0.210	12.43	0.000
logngf	-0.058	0.018	-3.19	0.002
age	-0.002	0.001	-2.09	0.038
logmaint_psqm	-0.020	0.018	-1.07	0.285
logenergy_psqm	-0.095	0.035	-2.73	0.007
logother_psqm	0.270	0.042	6.38	0.000
year_2003	0.044	0.043	1.03	0.304
year_2004	-0.023	0.041	-0.57	0.569
year_2005	-0.107	0.040	-2.67	0.008
quality_h	0.357	0.064	5.62	0.000
quality_m	0.125	0.053	2.34	0.019
elev	-0.142	0.145	-0.98	0.326
full_air	0.104	0.057	1.82	0.069
part_air	0.093	0.036	2.58	0.010



- 1** Result: 100 % increase in energy cost will shift rental income up to 9,5 %.
- 2** So up front investment cost for energy saving can be compared to rental premiums
- 3** There is no “One fits all market rule”!
- 4** National valuation organizations should run regression for general guidance.
- 5** There must be some guidance for emerging/ less transparent markets.
- 6** Due to the various types of EPCs across Europe direct integration of the label information is not possible.

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First evidence and status quo of Austrian property valuation practice

Results of investigation per region

	EPC available		EPC not mentioned		EPC mentioned (not available)		EPC own chapter		Energy aspects mention in calculation	
	income	other	income	other	income	other	income	other	income	other
Burgenland			1		1					
Carinthia			9							
Lower Austria	1		22	2	5	9			1	2
Upper Austria			4	1		3	1			1
Salzburg			2	3	4	1				
Styria			4	3	3	8	4	3		
Tyrol			11	9	8	1				1
Vorarlberg	1		5		4					
Vienna			21	9	20	7	12			
Total	1	1	79	27	45	29	17	3	1	4
	2		106		74		20		5	

Results of investigation per type of property

	EPC available		EPC not mentioned		EPC mentioned (not available)		EPC own chapter		Energy aspects mention in calculation	
	income	other	income	other	income	other	income	other	income	other
Condominiums	1	1	65	22	35	27	14	3	1	3
Lettable flats	0	0	0	0	2	0	1	0	0	0
Commercial real estate	0	0	14	5	8	2	2	0	0	1
Total	1	1	79	27	45	29	17	3	1	4
	2		106		74		20		5	

- 1 Valuation reports from www.edikte.at (valuation dates from Jan. 09 until Sep. 09 → EPC mandatory since 1.1.2009)
- 2 Total 182 valuation reports have been analyzed → 58 % haven't mentioned EPC at all and only in 1 % of cases an EPC was available
- 3 Significantly low perception of EPC in the valuation reports → The topic "Energy" plays a secondary role
- 4 EPC per se did not change the value
- 5 It was not possible to derive any experiences concerning integration and quantification of the EPC from the existing valuation reports
- 6 EPC needs more time to gain acceptance by customers and to be relevant for valuers

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Interim results – European property valuation practice (IMMOVALUE-Survey)

Already observed quantitative differences between energy-efficient and conventional properties



How value difference for energy-efficient properties has been implicated



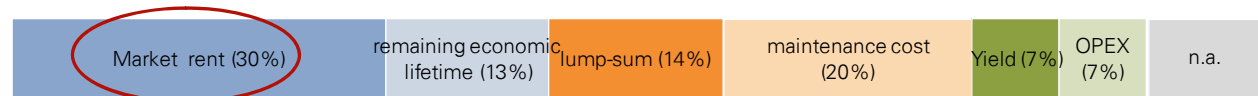
Difference in market value on average



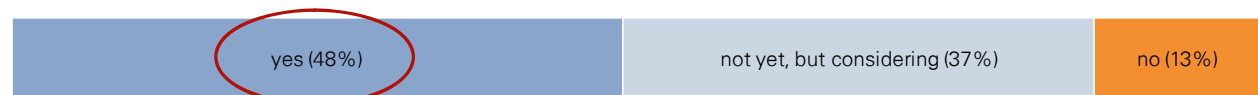
Related to which type of property the value difference occurred



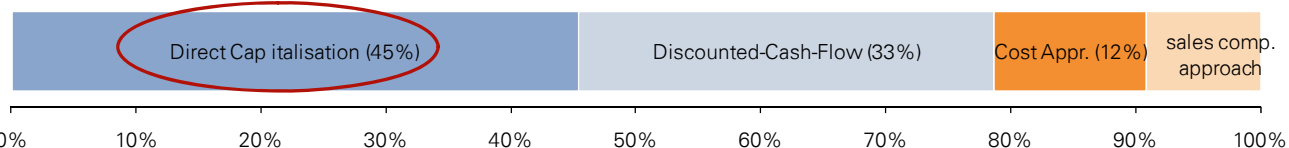
Valuation parameter used to express quantitative value difference



Has been energy efficiency already be considered within the qualitative descriptive part of valuation



Which well-known valuation approaches are most appropriate for integration of energy efficiency



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Scoring for daily work guidance (here – impact on rents)

Key Valuation Parameter	Market maturity	Significant adjustment	Medium adjustment	Low adjustment	neutral
Market rent	Opaque (Emerging) Market -> Premium for energetic building (primarily in emerging market)	- high price elasticity <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- low price elasticity <input type="checkbox"/>
		- high awareness of tenants for sustainability and energy efficiency <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- tenants do not pay attention on sustainability and energy efficiency at all <input type="checkbox"/>
		- omnipresence of green building issues in the media <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- media does not recognise green buildings benefits at all <input type="checkbox"/>
		- high market sensitivity for operating expenses and energy costs (especially in gross rent-orientated property markets) <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- majority of property market is not willing to pay rent premium for green buildings <input type="checkbox"/>
		- good general economic conditions <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- suffering economic situation <input type="checkbox"/>
		- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>
	-->Discount for non-energetic building (mainly in further developed markets)	- building does not achieve energy performance standards/codes <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- building achieve green building requirements <input type="checkbox"/>
		- market postulate green building standards/codes <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- market does not postulate green buildings <input type="checkbox"/>
		- high obsolescence and potential loss of occupier demand <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- no effect on occupier demand <input type="checkbox"/>
		- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>	- ... <input type="checkbox"/>

Market adjustment rate (MAR)	+/- 75-100 %	+/- 50-75 %	+/- 25-50 %	+/- 0-25 %
x Average adjustment parameter (AAP)*	+/- [] [%] -> AAP derived from market evidence / valuers expectations due to replicable argumentation or estimation			
x Valuers estimation adjustment (VEA)**	+/- [] [%] -> Valuers estimation adjustment due to probability of occurrence, uncertainty, etc. regarding the AAP			
= --> Weighted Adjustment Factor (WAF)	+/- [] [%] -> = MAR x AAP x VEA			
	Key Valuation Parameter (KVP)	Valuation Parameter Adjustment [VPA]		
	x [] [€/m ² p.m.]	= [] [€/m ² p.m.]		

I. Decide PREMIUM or DISCOUNT

II. Structure impact of more qualitative aspects (run the scoring)

III. Calculate overall market impact based on scoring

IV. Insert calculated maximum "Energy cost saving potential" (ECSP)

V. Adjustment based on own experience

VI. Calculate result

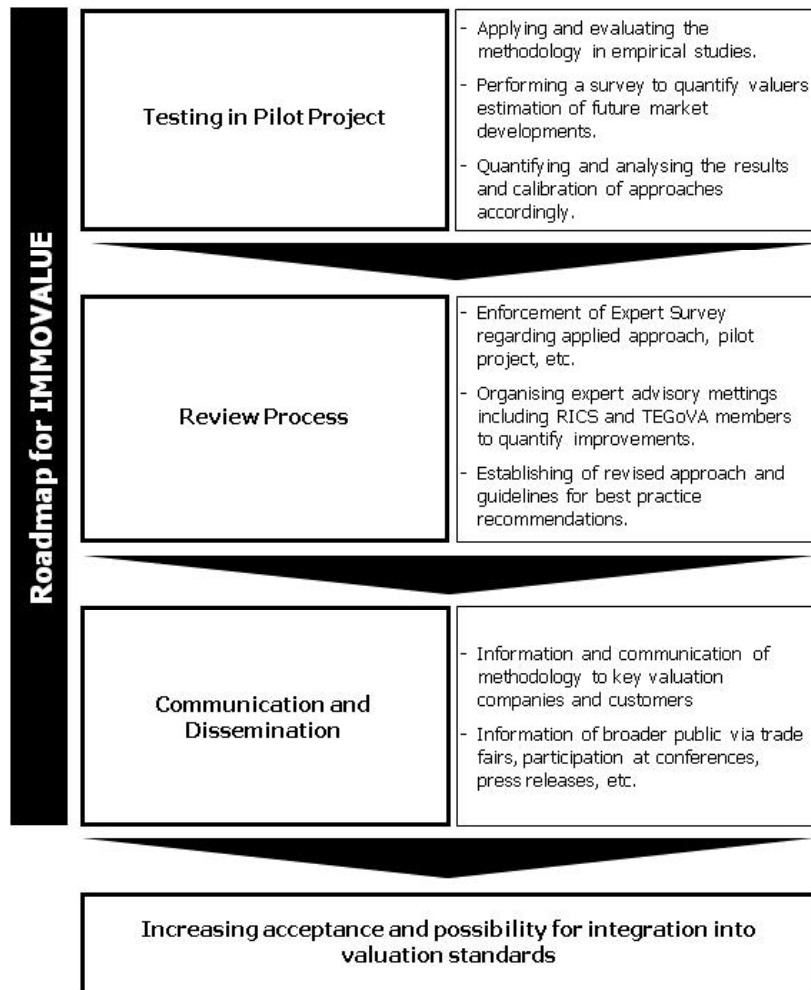
VII. Insert market rent

VIII. Calculate result

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Roadmap for IMMOVALUE

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1 Current Pilot Projects and a survey which quantify the valuers expectation concerning the overall topic is underway

2 The methodology will be reviewed by nominated international valuation experts in the next few month

3 On the basis of the results from the expert review and pilot projects a revised methodology will be created

4 To derive an broad acceptance and influence on future related work – Approaches will be communicated to key decision makers in the property valuation society

3 First results are expected in beginning of 2010 and will be available at www.immovalue.org

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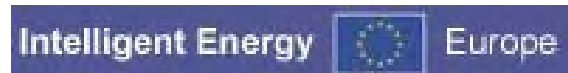
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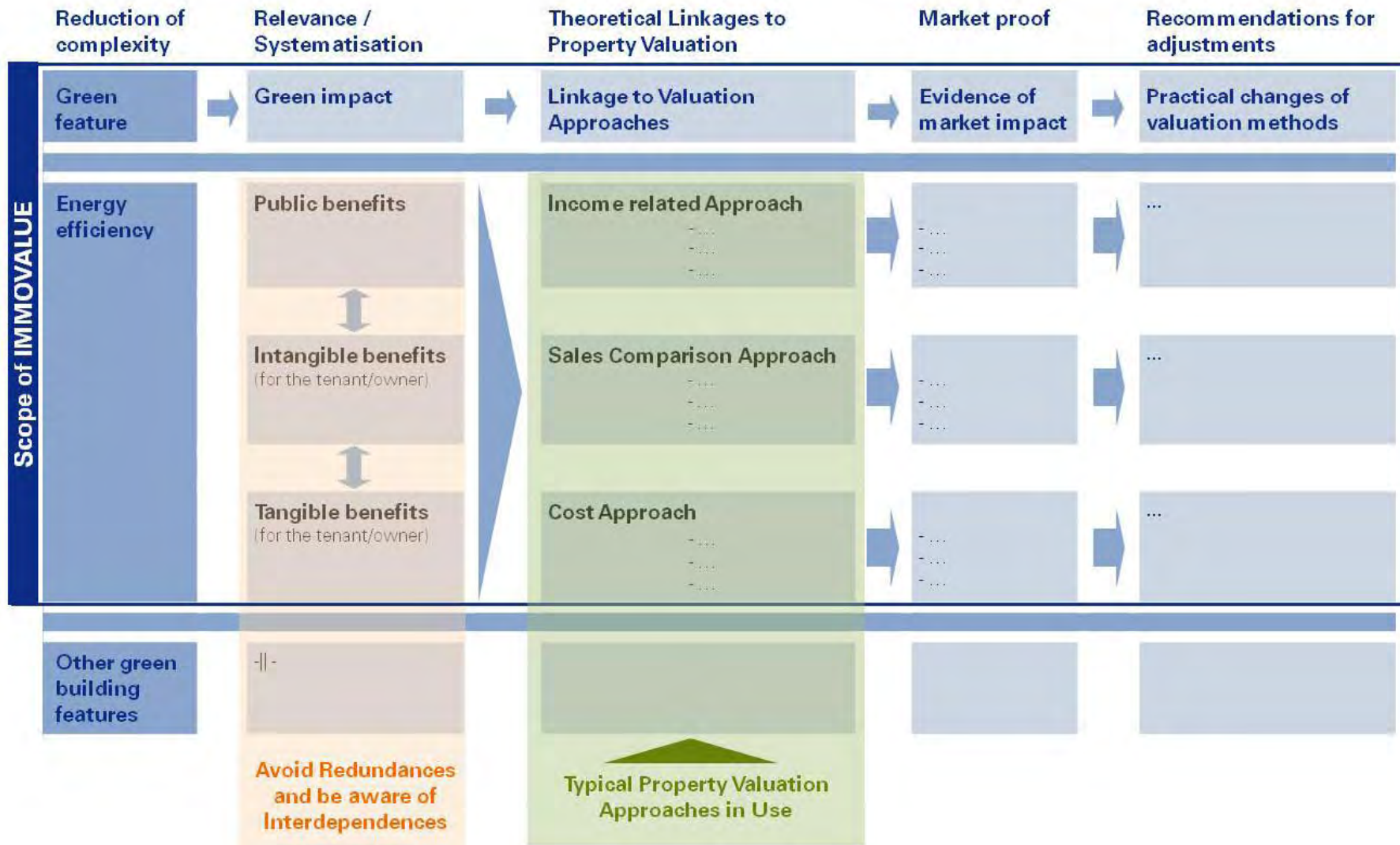
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Approach to IMMOVALUE results



Bienert – How does cost of energy affect your real estate business German data set analysis – results (P-Splines)

$$\begin{aligned} \ln(\text{rent_psqm}) = & \beta_0 + \beta_1 \text{quality_h} + \beta_2 \text{quality_m} + \beta_3 \text{elev} + \beta_4 \text{full_air} \\ & + \beta_5 \text{part_air} + \beta_6 \text{age} + \sum_{i=7}^{10} \beta_i \text{year}_i + \sum_{j=11}^{31} \beta_j \text{city_no}_j \\ & + f(\ln(\text{ngf})) + f(\ln(\text{maint_psqm})) + f(\ln(\text{energy_psqm})) + f(\ln(\text{other_psqm})) + \mathbf{u} \end{aligned}$$

