Sustainable retrofitting challenge

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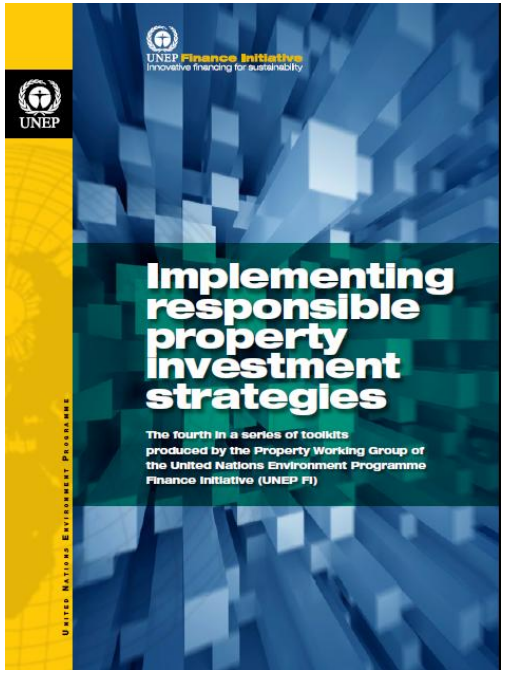
The UNEP FI Property Working Group (PWG)

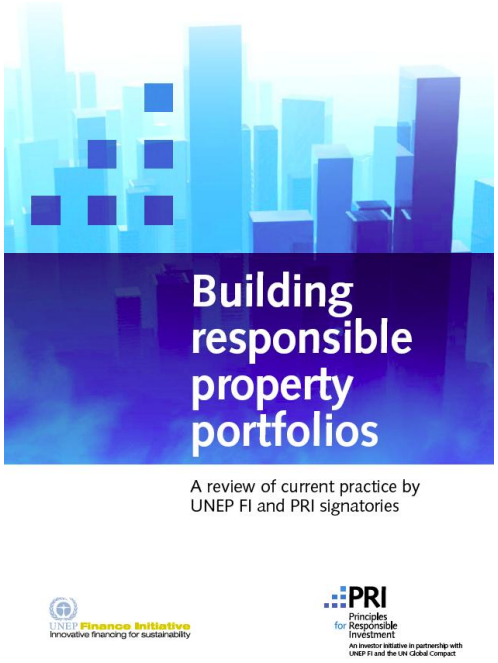
The PWG has become a global centre of excellence on responsible property investment (RPI), covering the following aspects:

- RPI best practice case studies
- Implementation of the PRI with respect to property portfolios
- Differences between responsible investment in equities and property
- Advancing the integration of ESG issues into property as part of fiduciary responsibility
- Sustainable building indicators benchmarks
- RPI and international climate change policy



The UNEP FI Property Working Group (PWG), PRI

- A toolkit series spanning RPI strategy implementation, owner-tenant engagement and green instruments, and RPI strategy and performance disclosure methods and transparency
- Environmental metrics for property to enable property investors and the public sector to measure the environmental performance of buildings and monitor progress
- Alignment of the design of environmental metrics with property investment performance metrics
- Financing mechanisms for energy efficiency solutions for the built environment



To learn more about the PWG:

http://www.unepfi.org/work_streams/property/index.html

Market Value - drivers

IFRS – fair value debate

Globalisation – consistent measurement = investor confidence

International Definition: "The estimated amount for which a property should exchange on the date of valuation between a willing buyer and a willing seller in an arm's-length transaction after proper marketing wherein the parties had each acted knowledgeably, prudently and without compulsion. ,,

Financial Regulation – macro-prudential supervision

Public expectation – demands professionals it can trust

Mark to market vs. sustainable concepts

- Market value definition is price surrogate “here and now” – a snapshot in time
- Other models seek to :
  - smooth out the peaks and troughs
  - encourage long term sustainable growth model
  - Incorporate a risk analysis element
  - Identify a “true” value that may be different to price
  - serve as a steadying hand on the market

Why do asset managers need metrics for?

1. To pilot and maintain assets value through uncertainty management
2. To gain insight about sustainability performance
3. To ascertain compliance with government regulatory requirements or specific client requirements
4. To monitor portfolios and their “future-proofness”
5. To provide guidance for better management
6. To benchmark properties

Main Questions

- What are the relevant sustainability related characteristics of buildings and sites ?
- How to describe and assess them?
- Are all sustainability related characteristics already linked with economic value and financial risk ?
- How can relevant characteristics be integrated into the specific valuation methods?
- How to avoid double-counting?
- How to deal with results of sustainability assessments ?

Where to find the data ?

1. **Collect existing data**

   A wide range of data is already available albeit scattered in different hands…

   - **Location:** to be developed
   - **Building profile:**

     Data already available
   - **Physical indicators :**
     - **For certified or rating buildings**

       Different presentations for the same underlying content
     - **For non certified or rated buildings**

       Information stored in different places (energy and water consumption, indoor environmental quality …)

2. **Order complementary study if required**

Enlightened Decision Making

Tools exist (e.g. DCF, LCC, LCA, Labelling, Certification) but are being used by market actors in isolation.

- **We need to deal with the complexity**
- **We need to coordinate information flow and translation between real estate communities!**

Where to find the data ?

Data are already mostly provided through the proliferation of ratings and certifications!

- ⇒ The main issue consists in organizing data-gathering and processing the “raw material” obtained.
- ⇒ Make complexity comprehensive through the life cycle (stop multiple “one shot” audits)

Certifications and ratings

	U.K.	U.K.	U.K. / EU	U.K. / EU	Hong Kong	Japan	Germany	Australia	France	Canada / U.S.	U.S.	Italy
Assessment Criteria	BREEAM	CFSH[a]	EPCs	DECs	BEAM	CASBEE	DGNB-Seal	Green Star	HQE	Green Globes	LEED	Protocol ITACA
Energy	X	X	X	X	X	X	X	X	X	X	X	X
CO_2	X	X	X	X			X		X	X		X
Ecology	X	X			X	X	X	X	X	X	X	X
Economy							X		?	X		?
Health and Wellbeing	X	X			X	X	X	X	X	X		?
Indoor Environmental Quality	X	X			X	X	X	X	X	X	X	?
Innovation	X				X		?	X	?		X	?
Land Use	X	X			X		?	X	X	X	X	?
Management	X	X		X	X	X	?	X	?			?
Materials	X	X			X	X	X	X	?	X		X
Pollution	X	X			X	X	X	X	X	X	X	?
Renewable Technologies	X	X	X				?	X	?	X	X	X
Transport	X	X			X		X	X	?	X	X	?
Waste	X	X			X		?		X	X		X
Water	X	X			X	X	X	X	X	X	X	X

Source:
http://www.costar.com

Certifications and ratings

Whatever the certification chosen, the underlying content remains the same:

Data

- Physical indicators
- Survey results from occupants

Weightings

- References to national standards
- References to local conditions
- Explicit weightings per categories

- Final aggregated result

  (rating score, certification level…)

Indicators	Score (in reference to standards)	Weighting
Physical indicators		
Survey results		
Total		Result

Certifications and ratings

Overall aggregation: example of BREEAM

BREEAM Offices 2005 - Design & Procurement Assessment tool

Design Stage Assessment Results

Core & Design & Procurement Credit Allocation Table

Overall Credit Allocation	Env Weighting	Available	Achieved	Percentage section credits achieved	Overall Weighted Percentage
Management	15%	10	5	50.00%	7.50%
Health & Wellbeing	15%	15	8	53.33%	8.00%
Energy		17	9	52.94%	
Transport		14	7	50.00%	
Energy & Transport	25%	31	16	51.61%	12.90%
Water	5%	6	4	66.67%	3.33%
Materials	10%	12	4	33.33%	3.33%
Land Use & Ecology	15%	11	6	54.55%	8.18%
Pollution	15%	12	6	50.00%	7.50%
				Totals	50.75%

Weightings

Results per category

Aggregated final result

Certifications and ratings

Aggregation within criteria group: example of DGNB

MAIN CRITERIA GROUP	CRITERIA GROUP	CRITERIA	SCORE MAXIMUM	CRITERIA POINTS ACHIEVED	CRITERIA POINTS MAX. POSSIBLE	WEIGHTING FACTOR	ADAPTATION FACTOR	WEIGHTED POINTS ACHIEVED	WEIGHTED POINTS MAX. POSSIBLE
ECOLOGICAL QUALITY	LIFE CYCLE ANALYSIS	Global warming potential	10	10.0	10	3	1	30	30
		Ozone depletion potential	10	10.0	10	1	1	10	10
		Photochemical ozone creation potential	10	10.0	10	1	1	10	10
		Acidification potential	10	10.0	10	1	1	10	10
		Eutrophication potential	10	7.1	10	1	1	7.1	10
	EFFECT ON THEGLOBAL AND LOCAL ENVIRONMENT	Local environmental impact	10	8.2	10	3	1	24.6	30
		Sustainable use of resources/wood	10	10.0	10	1	1	10	10
		Microclimate	–	–	–	–	0	–	–
	RESSOURCE CONSUMPTION AND WASTE GENERATION	Nonrenewable primary energy demand	10	10.0	10	3	1	30	30
		Total primary energy demand and share of renewable primary energy	10	8.4	10	2	1	17	20
		Drinking water demand and volume of waste water	10	5.0	10	2	1	10	20
		Land demand	10	10.0	10	2	1	20	20

Weightings

Certifications and ratings

Aggregation within sub criteria group: example of HQE

Topic 4: Energy management		
4.1. Réduction of energy demand through architectural design		
	Criteria	Performance
	4.1.1 Limitation of deperditions Ubat< Ubat max	B
	4.1.2 Reduction of energy demands Total energy demand Bioclimatic design	 B P
	4.1.3 Reduction of air permaeability Q4Pa< Q4pa ref	TP + x pts
4.2 Réduction of primary energy consumption		
	Criteria	performance
	4.1.1 Reduction of primary energy use Cep> X %Cep ref	TP + x pts
	4.1.2 Implementation of innovative system Innovative system list V	TP

Raw material to process

How to find the data ?

All certifications use physical indicators as the first ground for performance assessment.

⇒ Retrieve the raw data used in the certification process

⇒Organise the flow of datas and the needed transparency

Then, raw data can be used for:

- piloting and maintaining assets value
- impact assessment
- guidelines elaboration.

Additive Approach

Additive Approach

Traditional List of Information

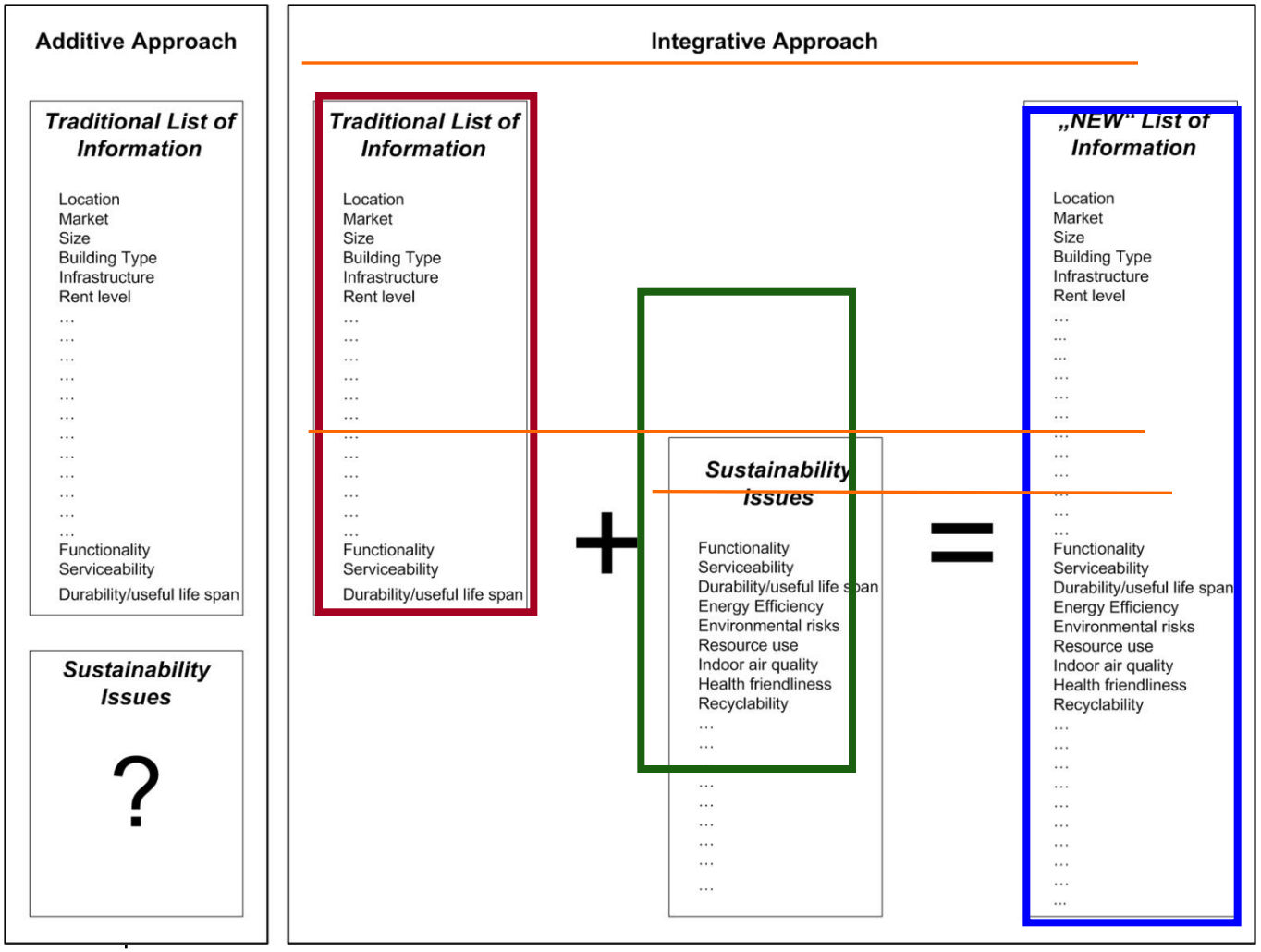
Location
Market
Size
Building Type
Infrastructure
Rent level
…
…
…
…
…
…
…
…
…
…
…
…
Functionality
Serviceability
Durability/useful life span

Sustainability Issues

?

Source T. LUTZKENDORF

Additive versus Integrative Approach

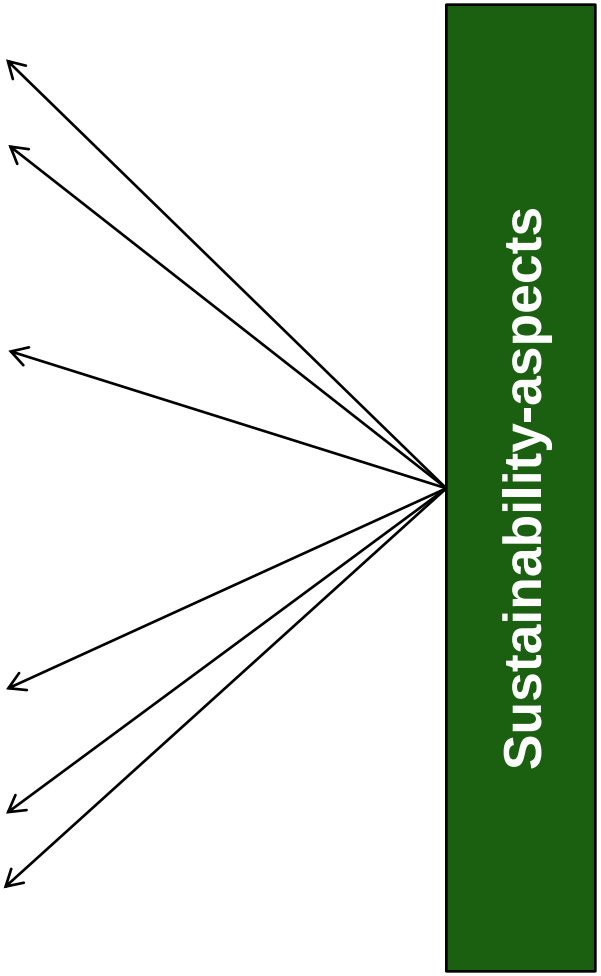


Source

T. LUTZKENDORF

“Longlist” of valuation-relevant property characteristics & attributes

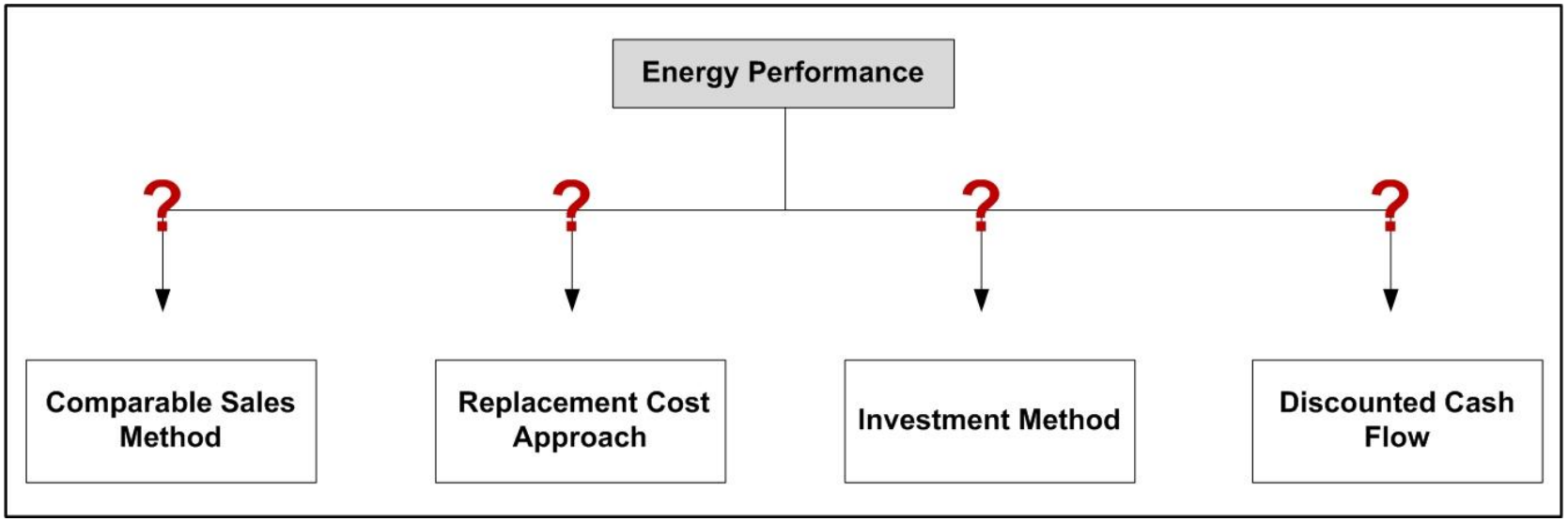
Main criteria groups	Sub-criteria groups
Location	**National market**
	Macro-location
	Micro-location
Plot of land	**Characteristics and configuration**
	Surroundings
Building	**Basic building description**
	Technical quality
	Functional quality
	Environmental qulity
	Design / Aesthetic quality
	Urban design quality
	Cultural value
	Health / comfort / satisfaction of inhabitants, user and visitors
Economic quality / cash flow	**Market**
	Payments-in
	Payments-out
	Vacancy / Letting situation
	Tenant and occupier situation
Building Image	**Brand value / Other**
Process quality	**Planning quality**
	Construction quality
	Management quality



Source T. LUTZKENDORF

It's all about "translation" / transforming information

How to translate a single building feature / characteristic so that it can be factored in / taken into account within the different valuation methods?



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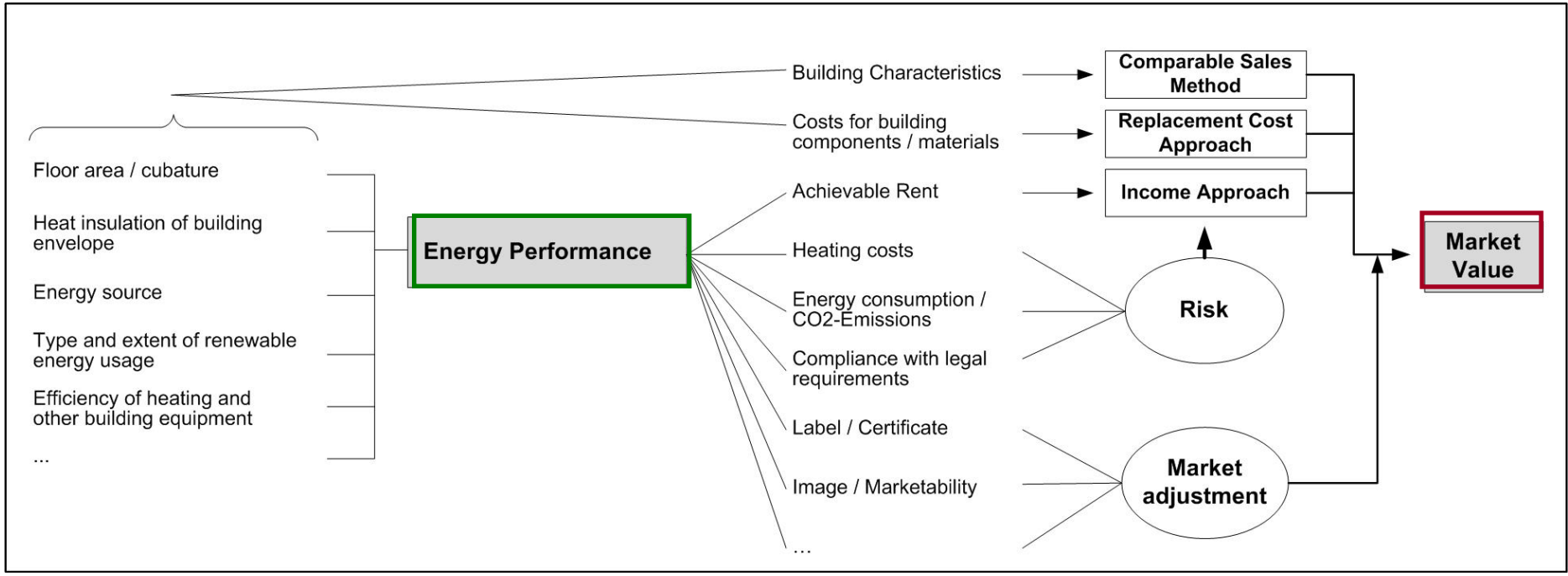
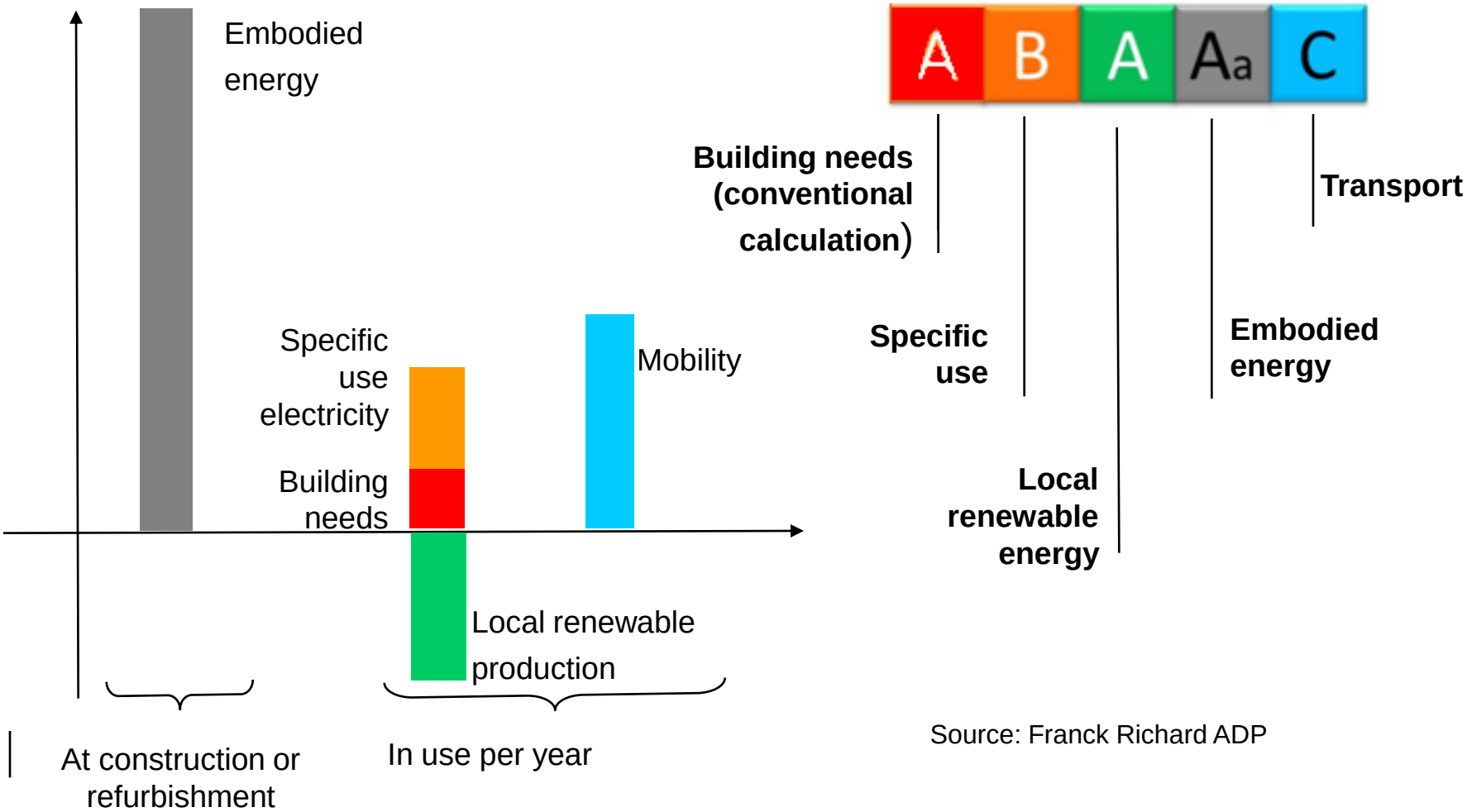
“Translation” of sustainability features



Source T. LUTZKENDORF

Example of energy : Dynamic Signature



Source: Franck Richard ADP

Integrating sustainability features into valuation methods: Example DCF-Method

Discounted Cash Flow (DCF)

- Changes in market participants' preferences
- Lower share of operating costs for tenants
- "Green lease"

- Ease of conducting maintenance and servicing activities
- Lower repair costs

$$Market\ Value = \sum_{t=1}^{n} (GIe - OETz - ME - OE + OI)_t \ x \ \frac{1}{(1+r_{disc})^t} + \frac{(GIe_n - OETz_n)}{(r_i + r_p - g + d)} \ x \ \frac{1}{(1+r_{disc})^n}$$

- Improved marketability
- Shorter vacancy periods

- Lower expenses for modernisation / revitalisation

- More stable cash flow
- Improved marketability
- Lower sales risk
- Image / Reputation gains
- Potential for increases in rents

- Longer useful economic lifespans
- Longer compliance with increasingly stringent environmental legislation

- Lower property risks (not yet explicitly taken into account in modelling of property cash flow)

- Improved competitiveness
- Rising energy costs
- "Sustainability Hype"

Explanation:

n:	Time frame in years
GIe:	Gross rental income
OETz:	Operating expenses non-attributable to tenants
ME:	Marketing expenses
OE:	Other expenses (e.g. modernisation, etc.)
OI:	Other income (e.g. advertising on building facade)
r_{disc}:	Discount rate
GIe_n:	Gross rental income in year n
$OETz_n$:	Operating expenses non-attributable to tenants in year n
r_i:	Risk-free rate
r_p:	Risk premium
g:	Growth rate
d:	Depreciation
$\frac{(GIe_n - OETz_n)}{(r_i + r_p - g + d)}$:	Terminal value of the building in year n

Source T. LUTZKENDORF

The perils of Discounted Cash Flow

- DCF is assumption explicit
- Rubbish in Rubbish out.
- The need to know what purchasers' requirements for target return.
- Stand Back and check the reliability of information and capex evaluation .

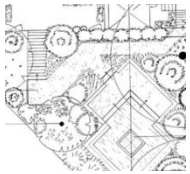
Green Value also depends on operation & use

Effective Green Value = **Building** *Intrinsic Quality* X **Operation** *Utilities & Maintenance* X **Use** *Env. best Practices*

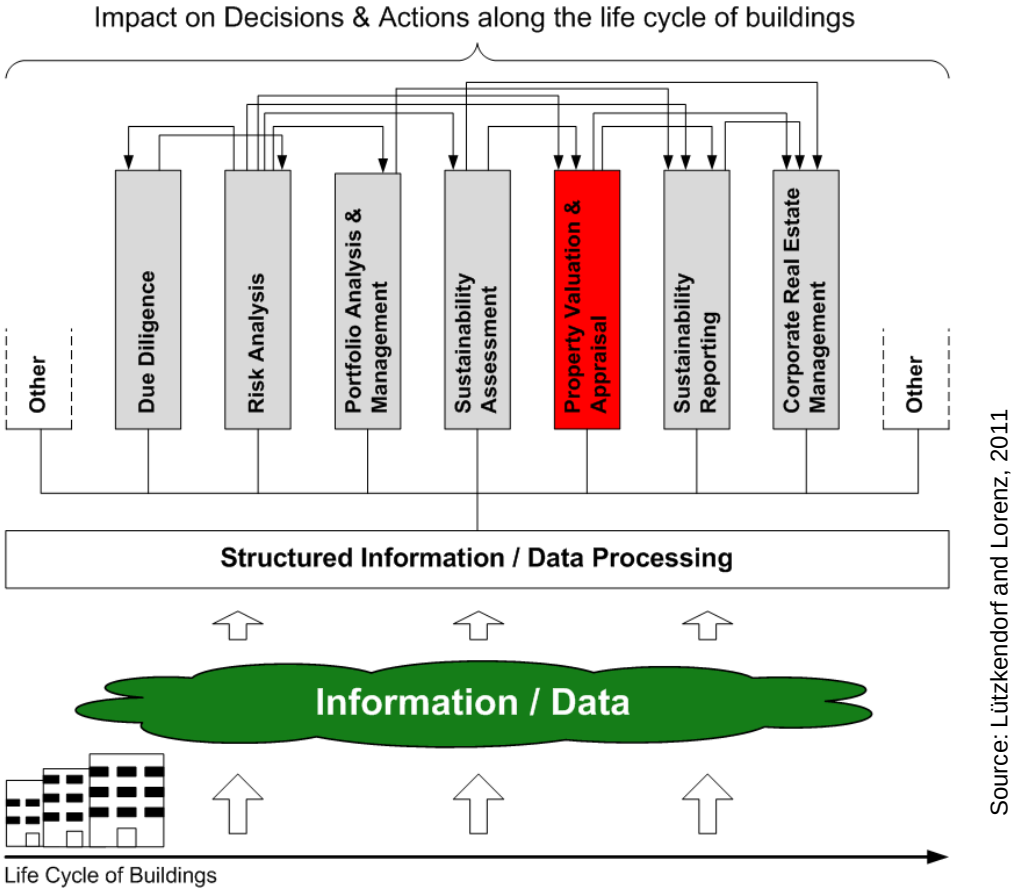
<u>Life span and flexibility</u>

COOPERATION – Data is valuable

Manufacture / Production



Planning / Design / Engineering



Source: Lützkendorf and Lorenz, 2011

Construction / Commissioning / Modernisation

Facility Management

Disposal & Recycling

A case study in Berlin

- A case study on an 22.000 m2 office building in Berlin built in the 1930s, with heavy refurbishment needs.
- Integrating results of Life-Cycle environmental and costing assessment of decisions
- Different refurbishment scenarios were considered with different time scales
- Assumptions were made on the resulting evolution of significant parameters of the existing building valuation

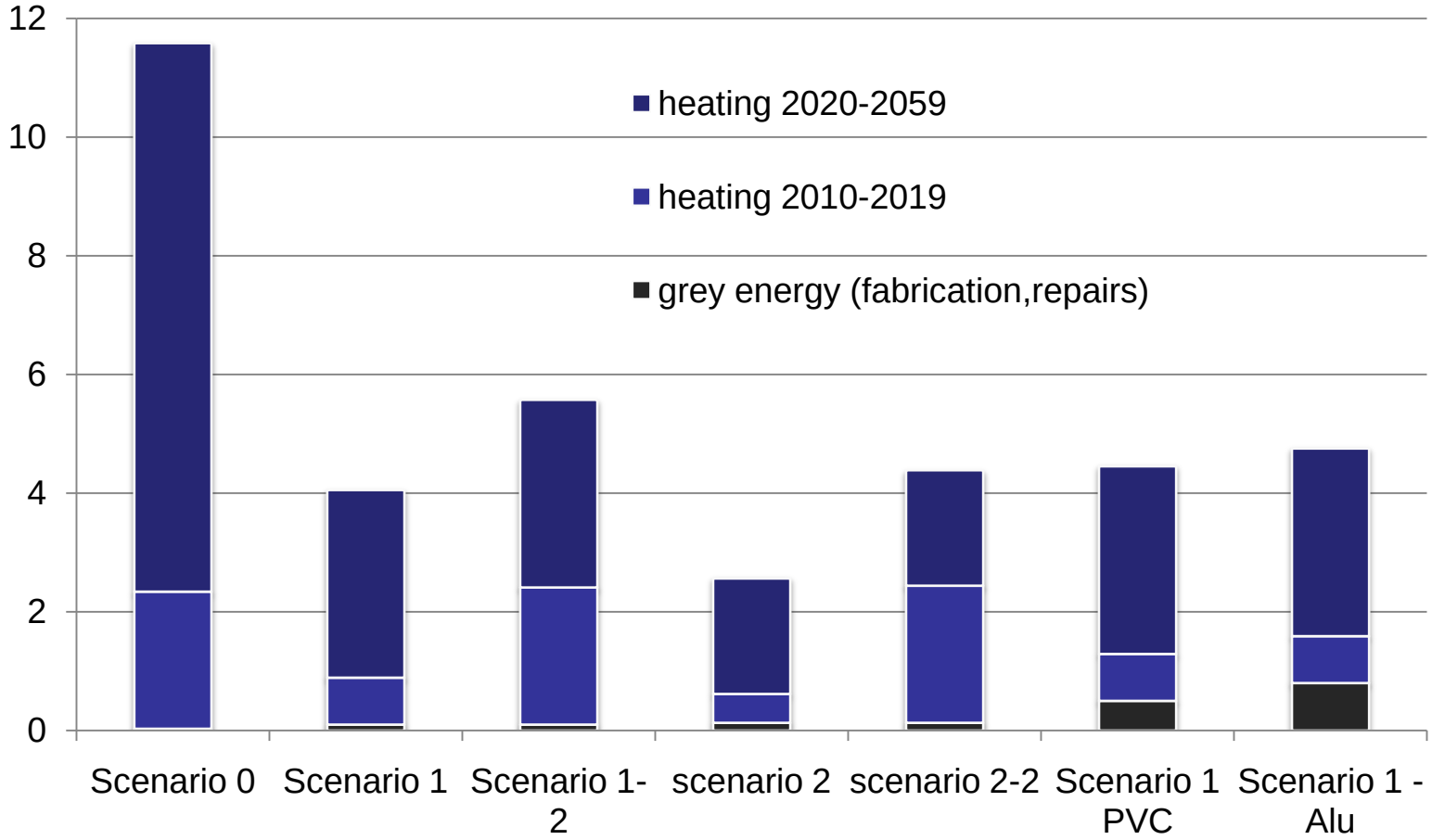
Source : Hovorka/Tiet

Scenarios and assumptions

Type of renovation \ Begin of works	2010	2020
Progressive obsolescence of the asset (steady-state scenario) →no investment costs →no energy savings	Scenario NP (non plausible)	
Cosmetic repair with no improvement of physical properties →150€ repairs per window every ten years, repairs spread on 3years → no savings	**Scenario 0**	
Windows replacement improving energy efficiency from U= 3 to 1,1 W/m²K), made on-site with tenant staying in the rental area, hardened FSC certified wood. → 1250€/unit, realization spread over 4 years →Savings: -25% of final energy consumption (100 → 75 kWh/m²)	**Scenario 1**	Scenario 1-2
High-performance replacement (made on-site as in scenario above) →2000€/unit in current prices but with sinking investment costs (1800€ in 2020) →savings: -31% of final energy consumption (100 → 69 kWh/m²)	Scenario 2	Scenario 2-2

Focus

Results: Life Cycle Environmental assessment



Life Cycle Analysis – CO_2 emissions (in tCO2-eq) linked to a window over 50 years

Results

	LCA: Total CO2 emissions for 1 window (tCO2/a)	LCC: Total expense for 1 window (distinction investor / tenant)	DCF: premium on the present value compared to sc0	Total Investment (present value) over 50 years
Scenario NP (obsolescence)	0 %	1.530 € *(0/1530)*	-5,4 %	
Scenario 0 (cosmetic repairs)	6.1 t	1.864 € *(334/1530)*	30.158.880 €	469.000€ (334 000€ over 15 years)
Sc1 Realization by 2010	-63 %	1774 € *(1250/524)*	+8,5%	1.705.000€
Sc1-2 idem 1 – realization 2020	- 51 %	1.678 € *(982/786)*	+6,0%	985.000€
Sc2 higher energy savings Realization by 2010	-77%	2322 € *(2000/322)*	+ 5,05%	2.746.000€
Sc2-2 idem 2 – realization 2020	-60%	1954€ *(1317/ 637)*	+6,3%	1.428.000€

In conclusion…

The use of sustainability assessments (ratings, certifications…) **as an information source** for assets
management, valuation, monitoring…

<u>Means prerequisites:</u>

- Ensure usability of sustainability assessments through the **requirement of detailed reports** which present results on a disaggregated levels in addition to the final aggregated result.
- Information must **reliable**, **organised** and easily **comparable** from year to year

What should we do next?

- **Agree on underlying main metrics** and their links with performance so that raw material data correspond to the same conventions and boundaries.

- **Organize the systematic raw data gathering** from:
  - Due diligence at purchase
  - Certifications and ratings
  - Maintenance operations and controls
  - Transmission of operational data (energy and water use…) from occupants through green leases for example

- **Design a building passport** to summon up data collected along the life of the building included conception (see BIM project)

- **Organise the technical data flows** in order to value these datas and make them easily comprehensive for other stakeholders