Sustainable buildings – Impacts on Cash Flow and Business Case Analysis

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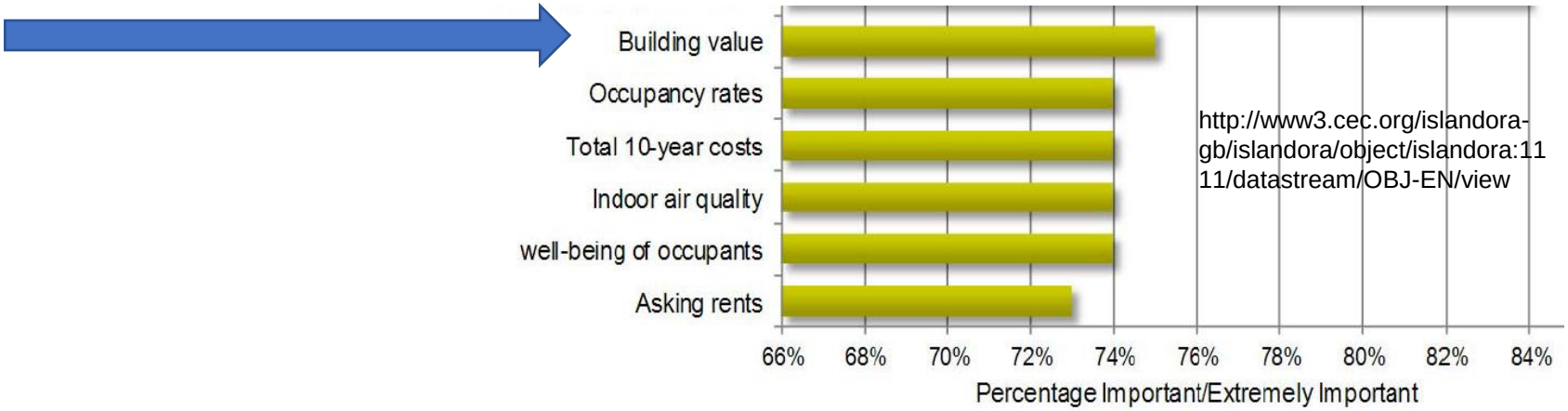
Questions

How can the **sustainability-related building characteristics** and features be **integrated into the traditional practices of the real estate sector** (for example, the valuation process)?

How can **transparency, compareability and comprehensibility** be improved?

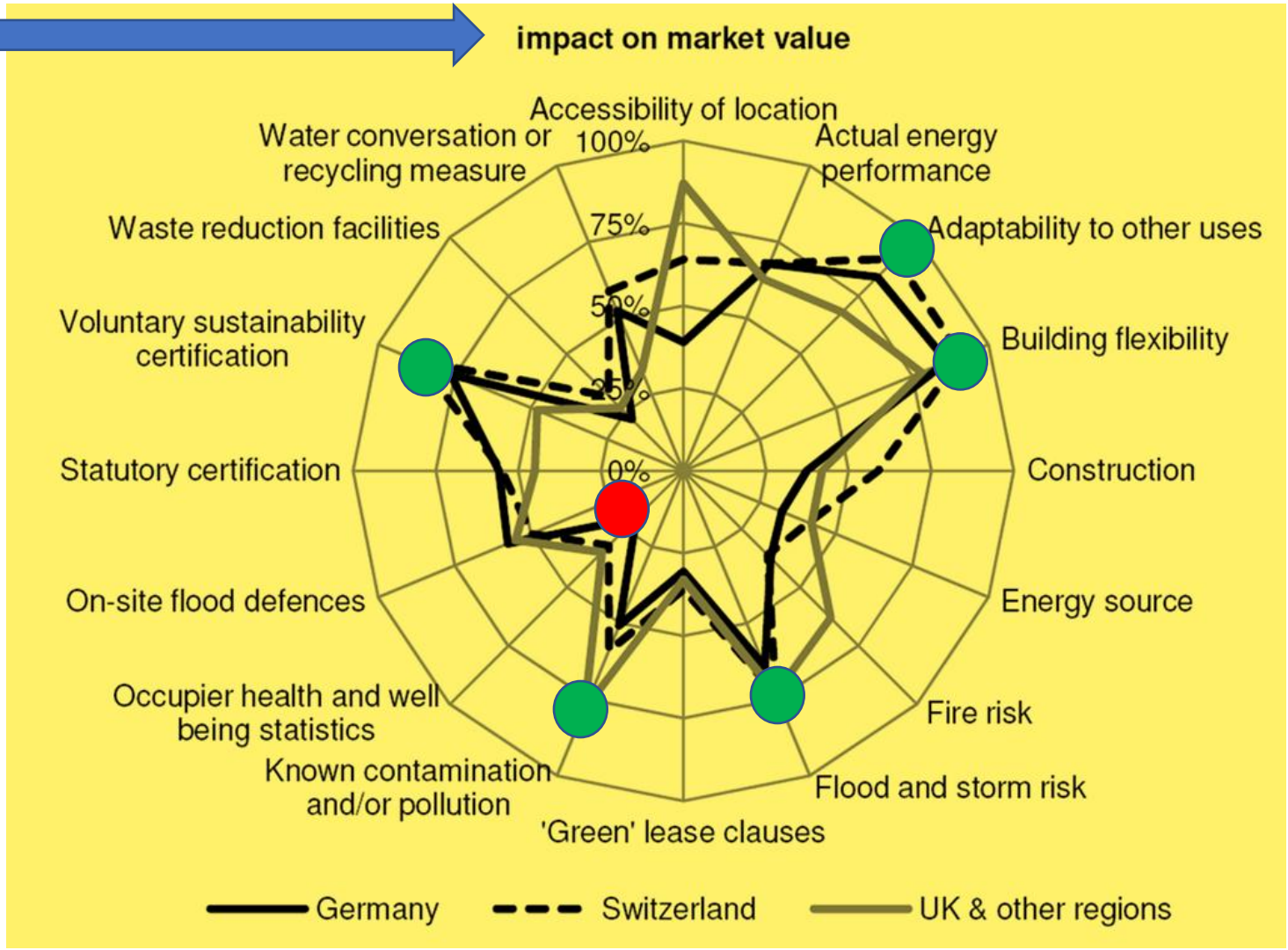
Starting situation

- The **main motive** of the demand for green buildings is no longer the improvement of the image, but the **recognition of economic advantages**
- The **economic advantages** must be both **proved empirically and demonstrated with traditional methods**.
- **No new methods** (e.g. for the valuation) need to be developed. Rather, **sustainability aspects must become a part of existing methods**.



Importance of sustainability factors when evaluating green building features (2012).[3]

Impact of sustainability credentials on Market Value



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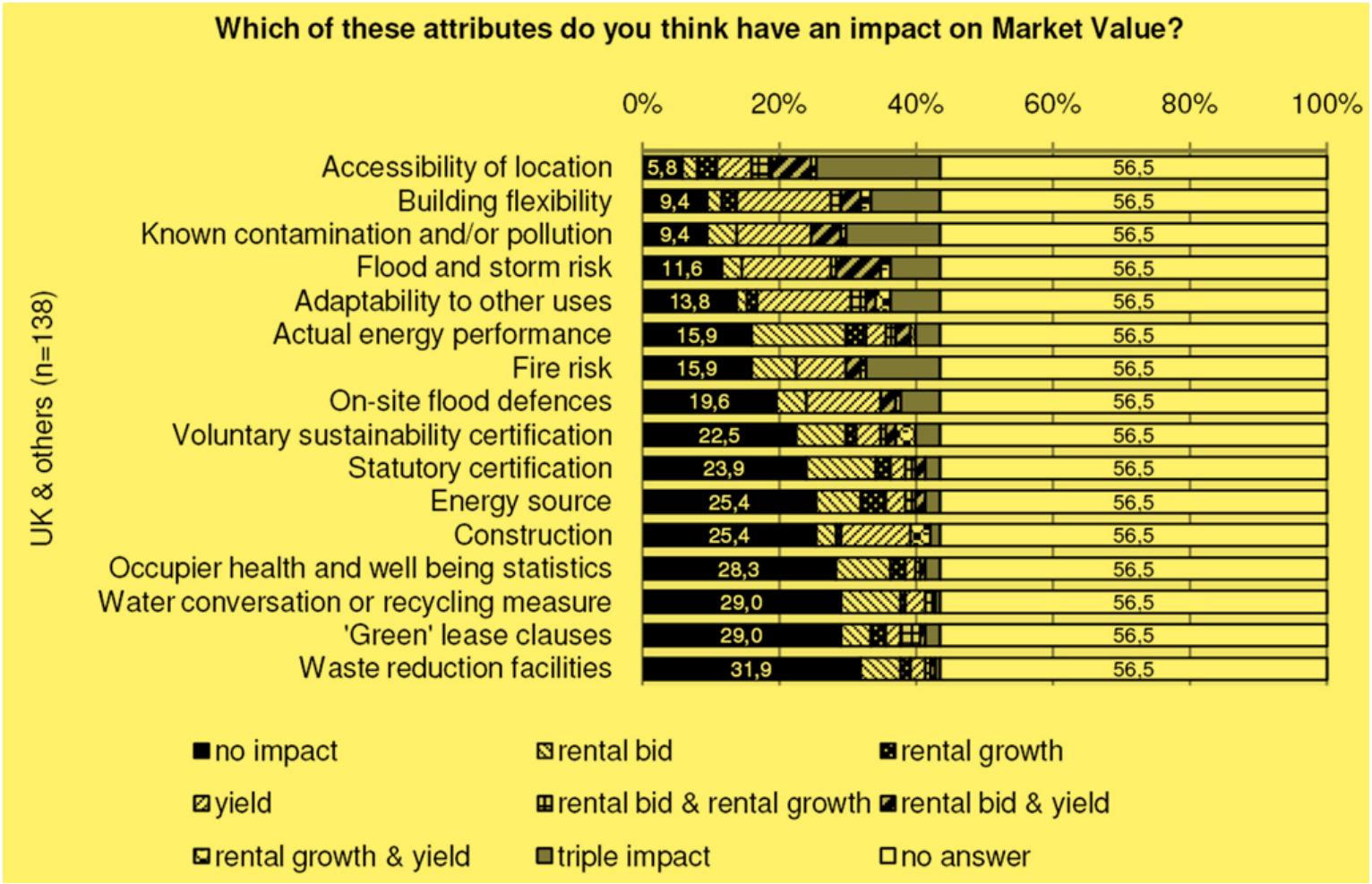
Different possibilities for reflecting sustainability credentials in Market Value estimates



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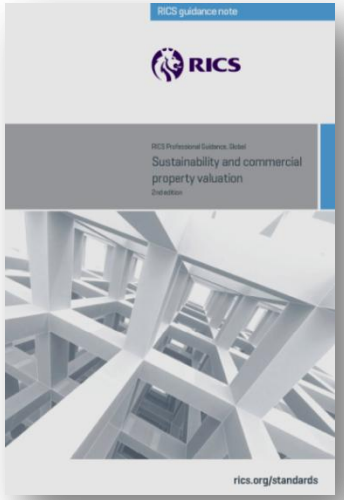
Introduction and Background

- The **consideration of the economic dimension** is inseparably linked to any assessment of buildings contribution to sustainable development (see ISO and CEN standards).
- The **integration of sustainability aspects into valuation theory and practice** respective guidelines and basics for the further **education of real estate professionals** have already been developed



How to assess the economic performance of buildings?

Paper ID: 2090

Life cycle costing
Assessment of market value

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Introduction and Background I

Current scientific debate concerning the description, assessment and interpretation of the economic performance of buildings

Approach A	main method used:	**Approach B**
Integration of the economic performance into sustainability assessment of single buildings economic indicator: ***life cycle costs (LCC)***	**DCF**	Integration of sustainable attributes into economic assessment of single buildings economic indicator: ***Market vs. Investment value***

Precondition: Approach C

Integration of sustainable attributes into analysis of *market fundamentals* (e.g. rents, prices, cap rate, constr. costs) as input parameters for methods typically used (e.g. DCF)

Discounted cash flow – a common method

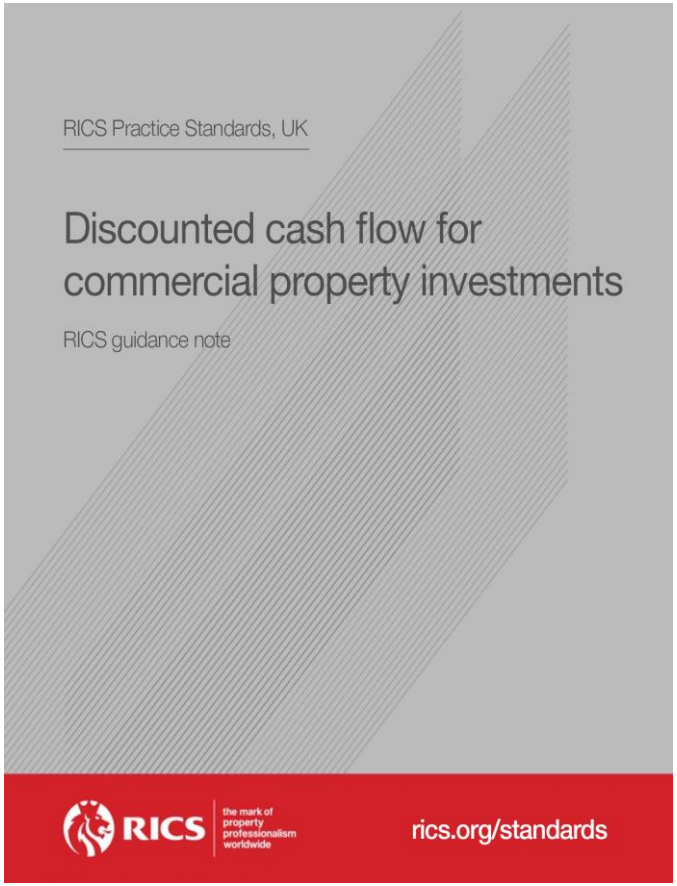
- Discounted Cash Flow (DCF) method is among the most **widely used property valuation approaches** as well as a commonly **accepted method for investment analysis**.
- **Here:** DCF is discussed as a tool for **estimating the market value** of single buildings only.
- Therefore input parameters reflect the current average market levels of a compareable building as well as the average future expectations of the market participants.

Discounted cash flow – a common method

DCF valuation involves projecting **estimated cash flows over an assumed investment holding period**, plus an **exit value at the end of that period**, usually arrived at on a conventional ARY basis.

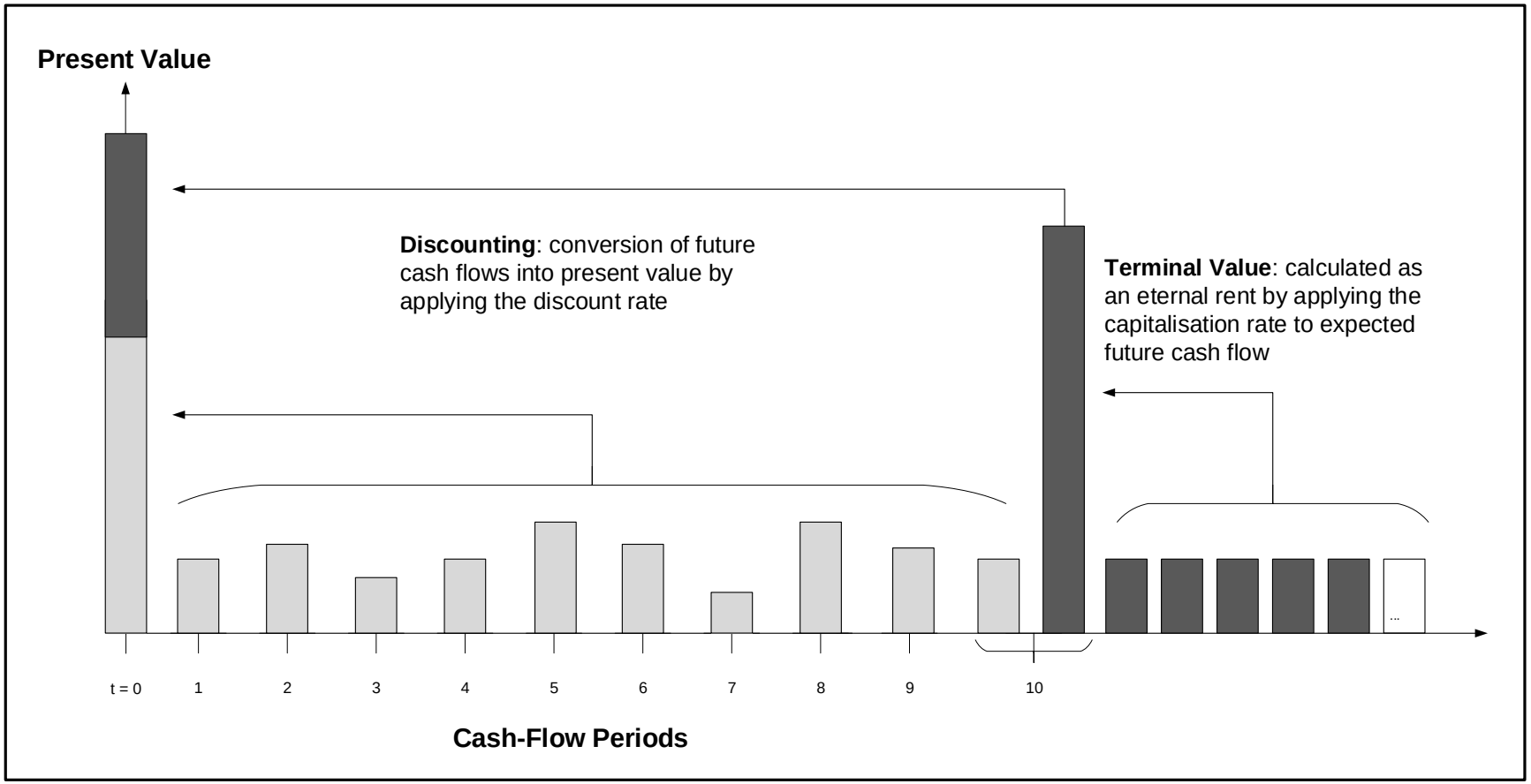
The cash flow is discounted back to the present day at a **discount rate**.

The **exit valuation** will **reflect anticipated rental growth**, the reversionary nature and unexpired terms of the leases at the exit date, and the application of an appropriate **ARY**.



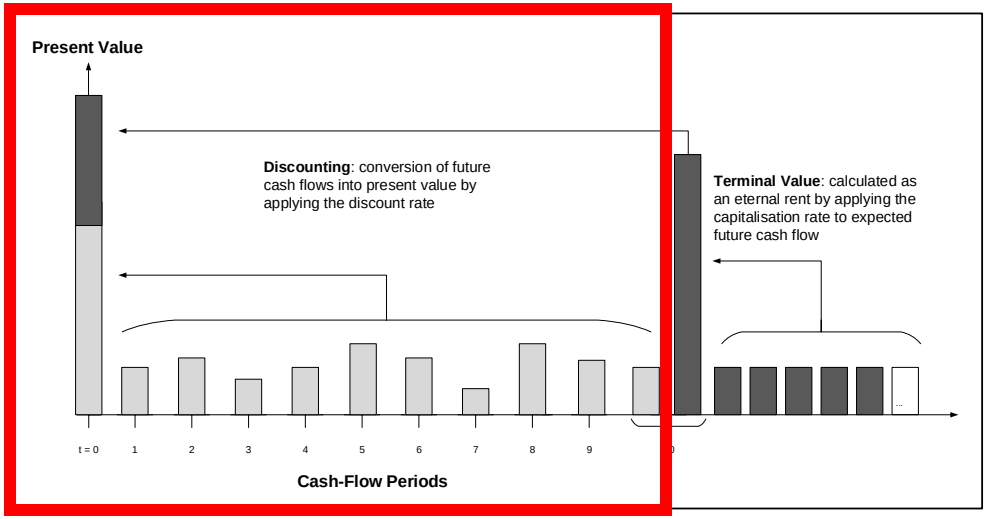
http://www.rics.org/Global/Downloads/RICS_Discounted_cash_flow_for_commercial_property_investments_2010_1_.pdf

Discounted cash flow – a common method



Discounted cash flow – stage 1

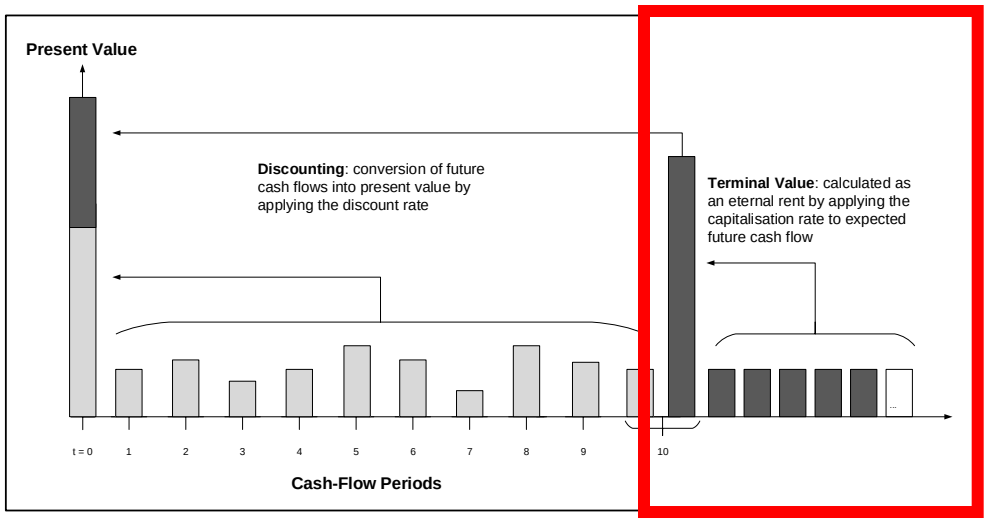
In theory, the DCF method **can** be very explicit / transparent during the study period since it requires for detailed cash flow projections.



This is particularly true whenever the valuer's/analyst's assumptions ***are not "hidden" within the applied discount rate but made explicit through the modelling of the individual cash flows.***

Discounted cash flow – stage 2

The **terminal value** at the end of the holding period usually significantly impacts the DCF result.



Estimating this **terminal value** is associated with considerable **uncertainties** that need to be taken into account.
In addition, **longer-term aspects** (like recyclability of the building, etc.) **need to be taken into account within the terminal value estimation**.
For both of these reasons, particular attention has to be paid when determining the **capitalisation rate**.

Reflections on the traditional DCF-approach - I

Major criticism of the traditional DCF approach is a **lack of transparency** mainly due to two circumstances:

Lack of a standardized structure for DCF calculation and documentation; so that benefits and risks are accounted for through different input parameters.

By determining **discount rates**, a **whole range of issues are implicitly (without an explanation what and why) taken into account.** This means how the value is derived and how sustainability related considerations might (or might not) have been considered is **not really transparent**.

Reflections on the traditional DCF-approach - II

- Typically a **short holding period (e.g. 5 or 10 years**) is applied. This contradicts with the desired **consideration of the full building life cycle** (e.g. within the scope of a life cycle cost analysis) and leads to the question **how future impacts** of certain building characteristics and attributes (such as flexibility and adaptability, recyclability, etc.) can be appropriately reflected and taken into account.

- There are currently **only few published approaches** on where and how to appropriately feed sustainability-related considerations into the traditional DCF approach.

Recommendations for the further development of the DCF-method

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Karlsruhe Institute of Technology

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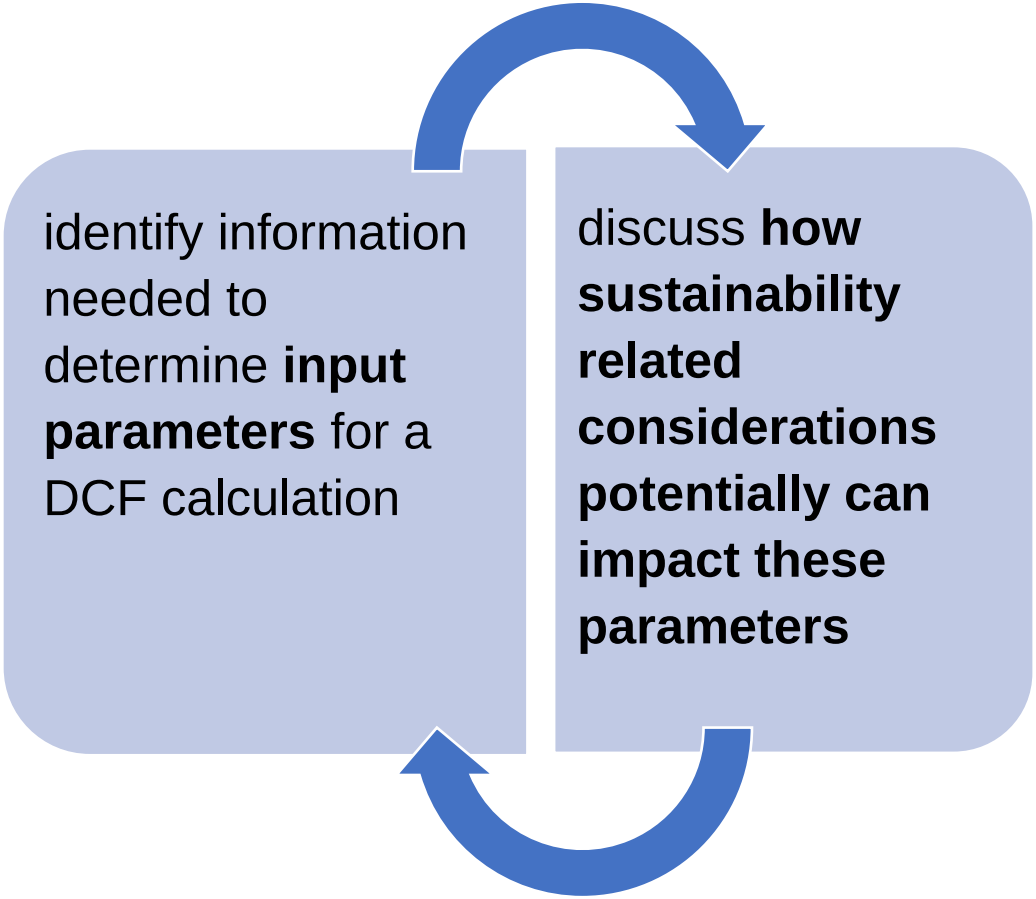
Recommendation 1.a

Increasing the transparency of the traditional DCF approach



Recommendation 1.b

Increasing the transparency of the traditional DCF approach

Starting Point: Projection of expected cash flows.

Usually only cash flows are represented which **directly relate to the investor**, **additional information will get lost**.

It is recommended to present (or at least mention as additional information) **all potential incomes and expenses.**

Recommendation 1.c

Increasing the transparency of the traditional DCF approach

- Within the usual presentation as a spreadsheet this would result in **two additional columns** indicating **which incomes and expenses have been considered** and **which are presented as additional information** only.

- Additional information can serve as a **foundation for certain assumptions** within the valuation; e.g. ***low energy costs (additional information) can justify the assumption of a higher rental income*** or rental growth rate (relevant information).

Recommendation 1.d

Increasing the transparency of cash flow projections

Cashflow components		**DCF-calculation**	**Additional information**
Incomes	Rents	**X**	
	Incomes from advertising, mobile communications antenna, etc.	**X**	
	Energy supply to third parties	**X**	
	Incomes from recycling of building materials/components		**X**
	…		
	Terminal Value	**X**	

Recommendation 1.e

Increasing the transparency of cash flow projections

Cashflow components		DCF-calculation	Additional information
Expenses	*Energy*		**X**
	Water/Wastewater		**X**
	Cleaning		**X**
	Maintenance and repairs	**X**	
	Replacement of equipment	**X**	
	Modernisation	**X**	
	Marketing (letting and sale)	**X**	
	Insurances	**X**	
	…		

Recommendation 2.a

Allocation and the integration of sustainability-related aspects

- Integration of sustainability-related aspects into **property valuation does not require the development of new methods** but a **further development of existing approaches**.
- The authors have contributed to a **guideline for Austria, Germany and Switzerland** on integrating sustainability aspects into property valuation practices.
- As a result of a **research initiative of the Green Building Alliance**, **recommendations for integrating sustainability aspects into DCF calculations** are available [12].
- The **following tables** represent some of these results which have been produced with the authors participation.

Recommendation 2.b

Allocation and the integration of sustainability-related aspects

Most important variables which are influenced by **sustainability issues**:

(1) the risk of losing the tenant(s),
(2) growth potential for rent and value,
(3) occupier costs,
(4) tenant retention and fluctuation,
(5) duration and costs of letting
(6) depreciation as well as refurbishment and maintenance costs.

Recommendation 2.c

Allocation and the integration of sustainability-related aspects

DCF Input Parameters	Key sustainability-related quality and performance characteristics
Market rent	– Comfort level – Building related services: serviceability – Aesthetic and cultural quality – Presence of certification schemes/labels (and associated brand image) – Energy performance level (based on EPC or other assessments) – Mandatory requirements & market standards as regards sustainability performance – Space efficiency – Accessibility

Recommendation 2.d

Allocation and the integration of sustainability-related aspects

DCF Input Parameters	Key sustainability-related quality and performance characteristics
Current utilities	– Level of utilities costs attributable to the tenants and the owner – Source of energy (presence of renewable sources) – Energy costs trends
Operation expenses and repairs	– Durability and maintainability of components – Ease of cleaning (part of maintenance) – Cost of repairs – Reliability of technical installation (failure per hours of running time)

Recommendation 2.e

Allocation and the integration of sustainability-related aspects

DCF Input Parameters	Key sustainability-related quality and performance characteristics
Capital expenses	– Modernisation expenses (energy efficiency retrofit, improvement of functionality, resources consumption, etc.) – Costs for adaptation to climate change and user needs – Dismantling, landfill and /or recycling of components
Duration to let	– Aesthetic and cultural quality – Flexibility and adaptability (easy to move in), – Compliance with ESG regulation of tenants – Presence of certification schemes/labels (and associated brand image) – Space efficiency – Accessibility

Recommendation 2.f

Allocation and the integration of sustainability-related aspects

DCF Input Parameters	Key sustainability-related quality and performance characteristics
Discount rate	– Risk assessment of impact of climate change – Resilience against natural and climate hazard (e.g. flooding, etc.) – Structural safety
Capitalis. rate	– Durability and recyclability of the building – Future-proofness and degree of resistance against various forms of obsolescence – Compliance with foreseen regulations – Long-term aesthetic quality

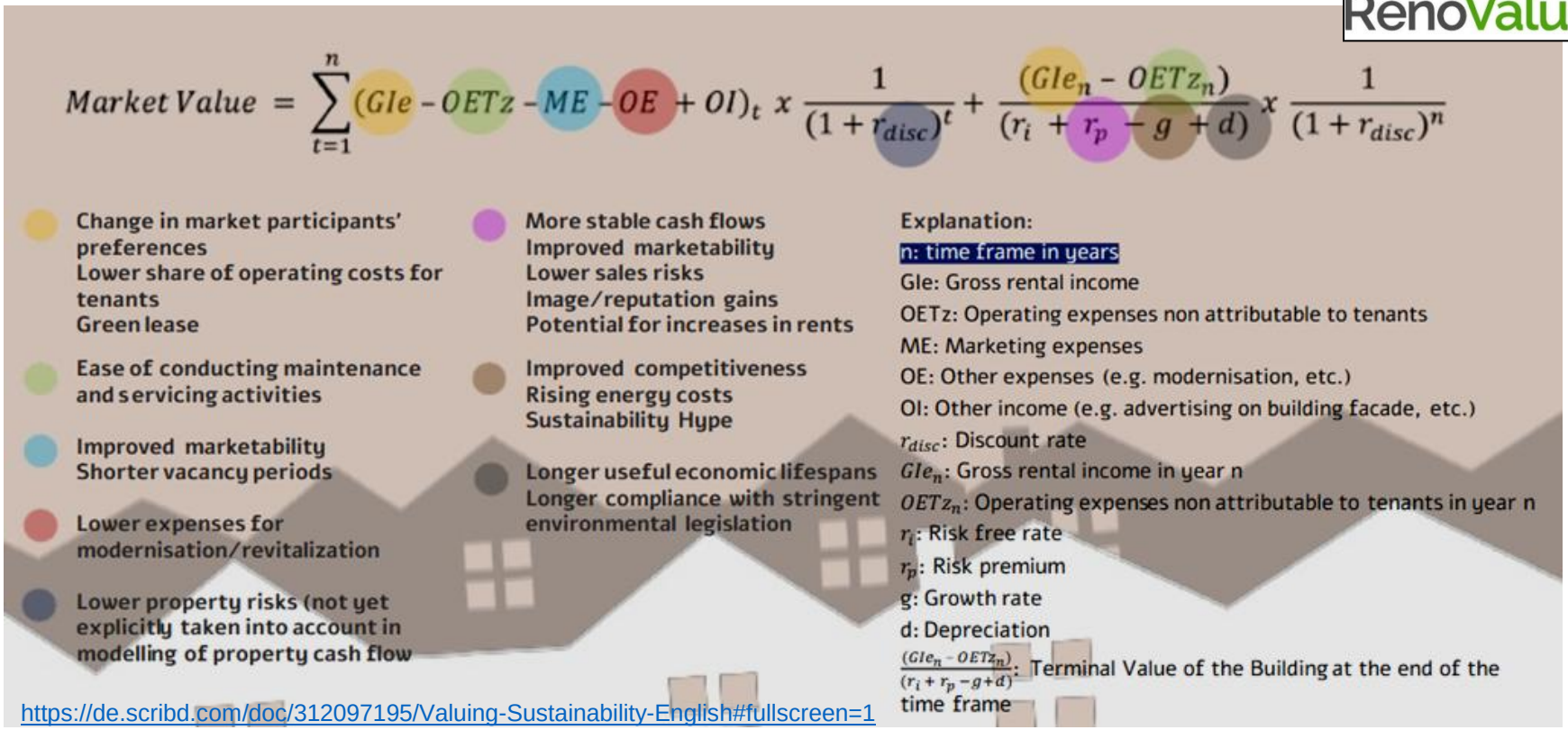
Recommendation 2.g

Allocation and the integration of sustainability-related aspects

- At the minimum, it is recommended that within a DCF calculation a **supporting document** or explanation is being produced revealing **which sustainability-related aspects have been taken into account through which input parameter**.

- In addition, the respective **source of information** (e.g. planning documentation, building passport, consumption values) should also be disclosed.

Teaching material as result of RenoValue-project



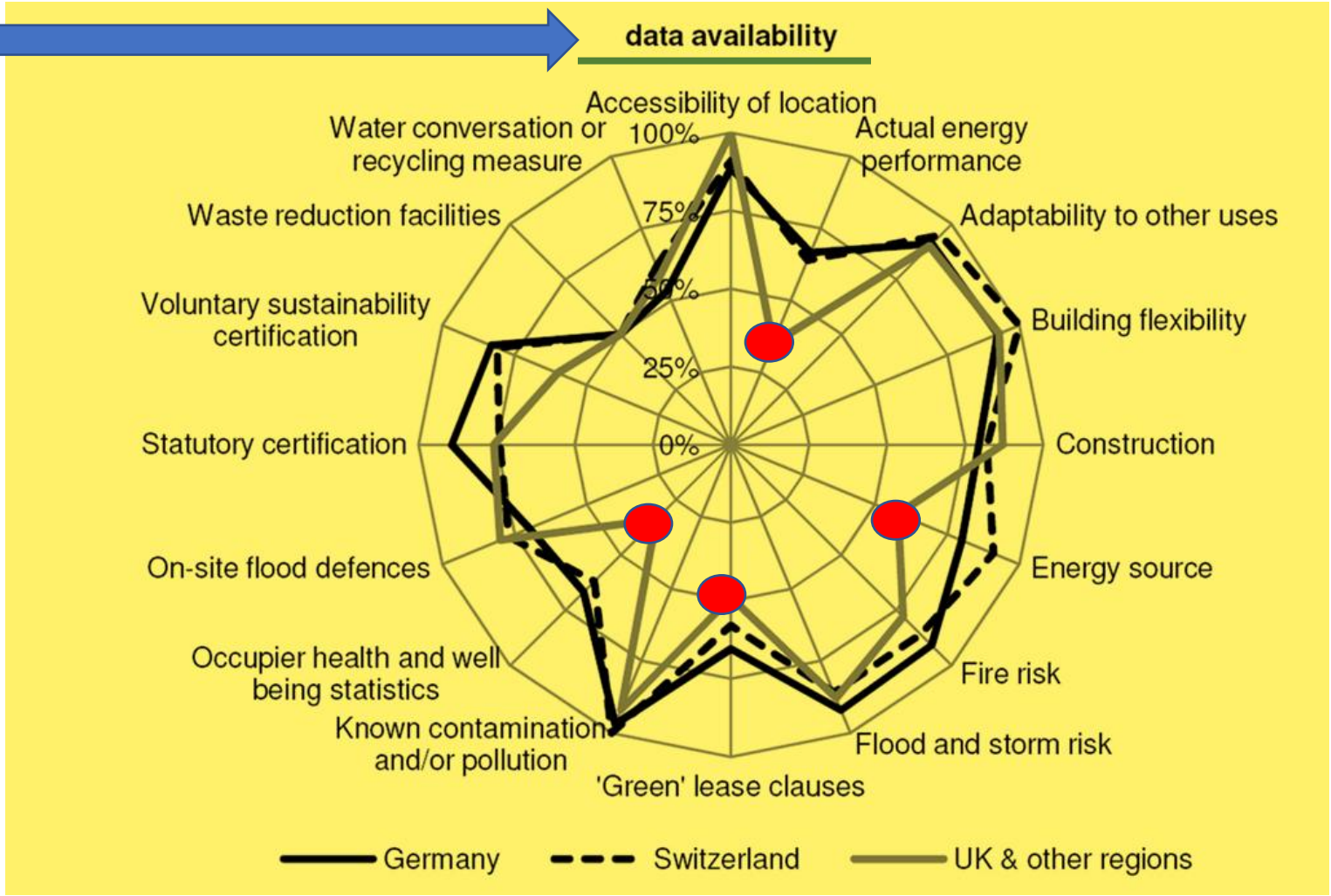
https://de.scribd.com/doc/312097195/Valuing-Sustainability-English#fullscreen=1

In Reno-Value-Projekt possibilities for integrating sustainability aspects into the valuation are presented. The freely accessible material is suitable for self-study.

Practical recommendations for the Discounted Cash Flow

- Provided you have enough information to model annual cash flows, DCF gives you the opportunity (and greater flexibility) to **account for a broad spectrum of sustainability-related benefits/risk** through subtle **adjustments to valuation input parameters** in a transparent way.
- Carry out quantitative sub-financial analyses (e.g. Cost-Benefit Analyses, Health/Productivity Benefit Analyses, Life cycle costing) as an **additional information source** for the specification / adjustment of DCF input parameters
- Carefully consider the choice of the **exit capitalisation rate** since all potential longer-term benefits/risks need to be reflected here.
- Try to **address as many income / expense considerations within the cash flows** and **not in the discount rate** (increases transparency).

Improvement of data availability/accessibility is a key issue



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Conclusions and Outlook

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Conclusion - I

- Recommended **adjustments to the traditional DCF approach** can contribute to an **improved transparency and traceability of DCF results** and provide a basis for the development of a **standardised format** and approach for **DCF calculations and resulting documentations.**

Conclusion - II

- The consideration of sustainability-related aspect within the scope the **estimating the terminal value** of a building at the end of the holding period **contributes to resolving the conflict between investors short-term oriented decision-making horizon and longer-term implications of certain sustainability-related performance aspects.**
- It needs to be acknowledged that the topic of terminal value estimation – particularly the issue of treating **uncertainties** – deserves **further work and scientific debate**.

Outlook

Valuation professionals can contribute with their methods to the **quantification and demonstration of the economic advantages** of sustainable buildings.

They (indirectly) contribute to the **increasing demand for sustainable buildings.**

Thank you



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