The Future of Commercial Real Estate is Green: But Why Are We Still Debating?

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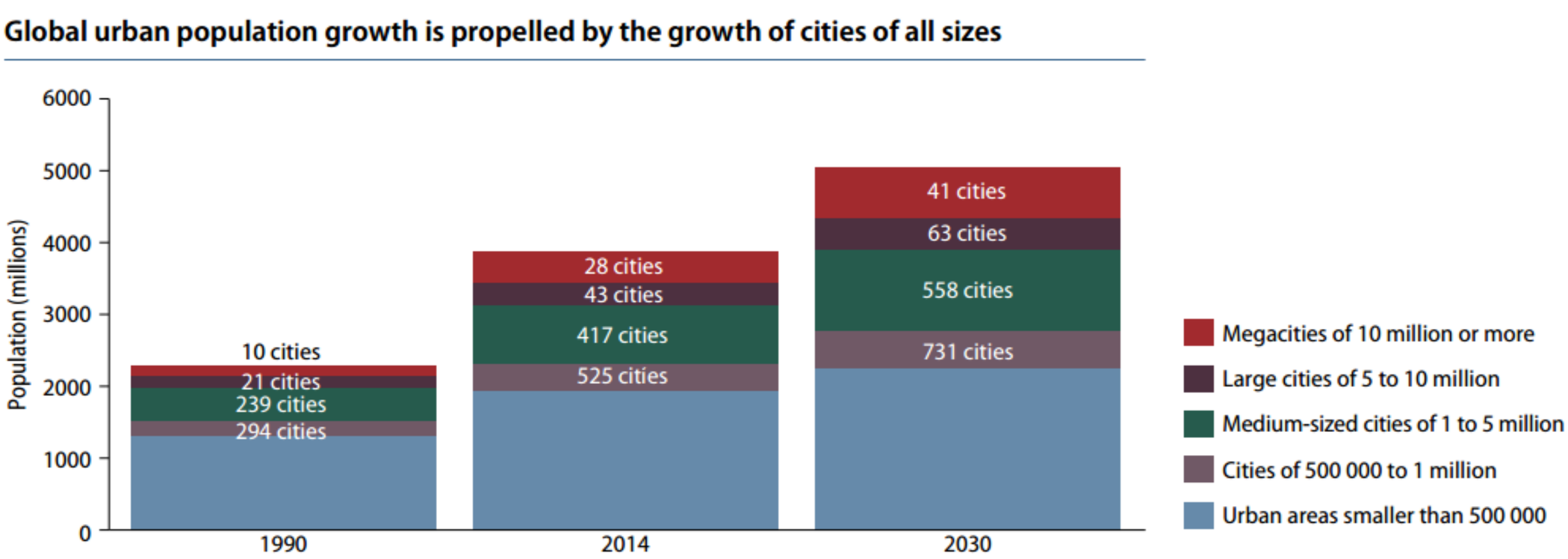
Commercial Real Estate & Sustainability

- The Commercial Real Estate has an important role in sustainability agenda
  - Property Market going to face changes due to newly evolving legislative requirements and changing standards.
  - The important role in climate change does not mean solely negative things. Previous research has reported many kind of benefits for the real estate sector's players such as image benefits, decreased costs, happier and healthier employees etc (Schleich, H. Et al 2009).
- Drivers and benefits for the Commercial Real Estate Investor?
- There are lot of discussion about the benefits, but is there scientific evidence?

L’Accord de Paris



- In Paris in late 2015, the 21st annual Conference of the Parties (COP-21) to the United Nations Framework Convention on Climate Change took place. At this historic event, 195 countries reached an unprecedented agreement to combat climate change by accelerating and intensifying the transition to a near-zero carbon global economy this century.

L’Accord de Paris

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- the Paris Agreement on climate change, otherwise known as L’Accord de Paris. The central element of this agreement is the aggressive scientific objective of holding the increase in the global average temperature to well below 2°C above preindustrial levels and of pursuing efforts to limit the temperature increase to 1.5°C.

L’Accord de Paris

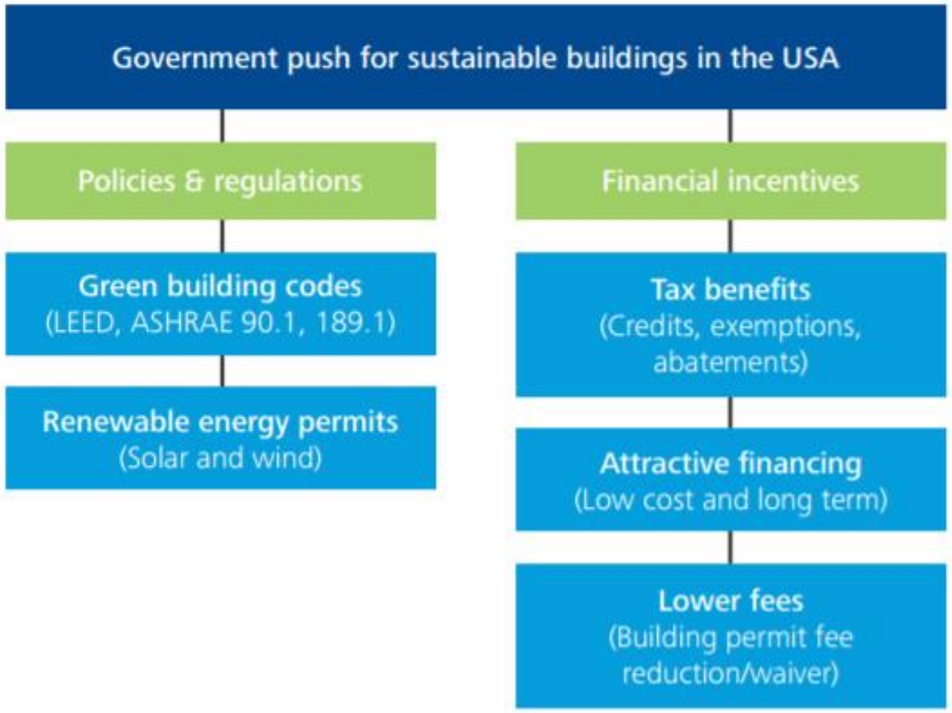
- The buildings sector has one of the highest carbon footprints – it currently contributes to **30% of global annual greenhouse gas** (GHG) emissions and consumes around 40% of the world’s energy.

- Following through on the commitments made in Paris means avoiding **77% in total CO2 emissions** in the buildings sector by 2050 compared to today’s levels.

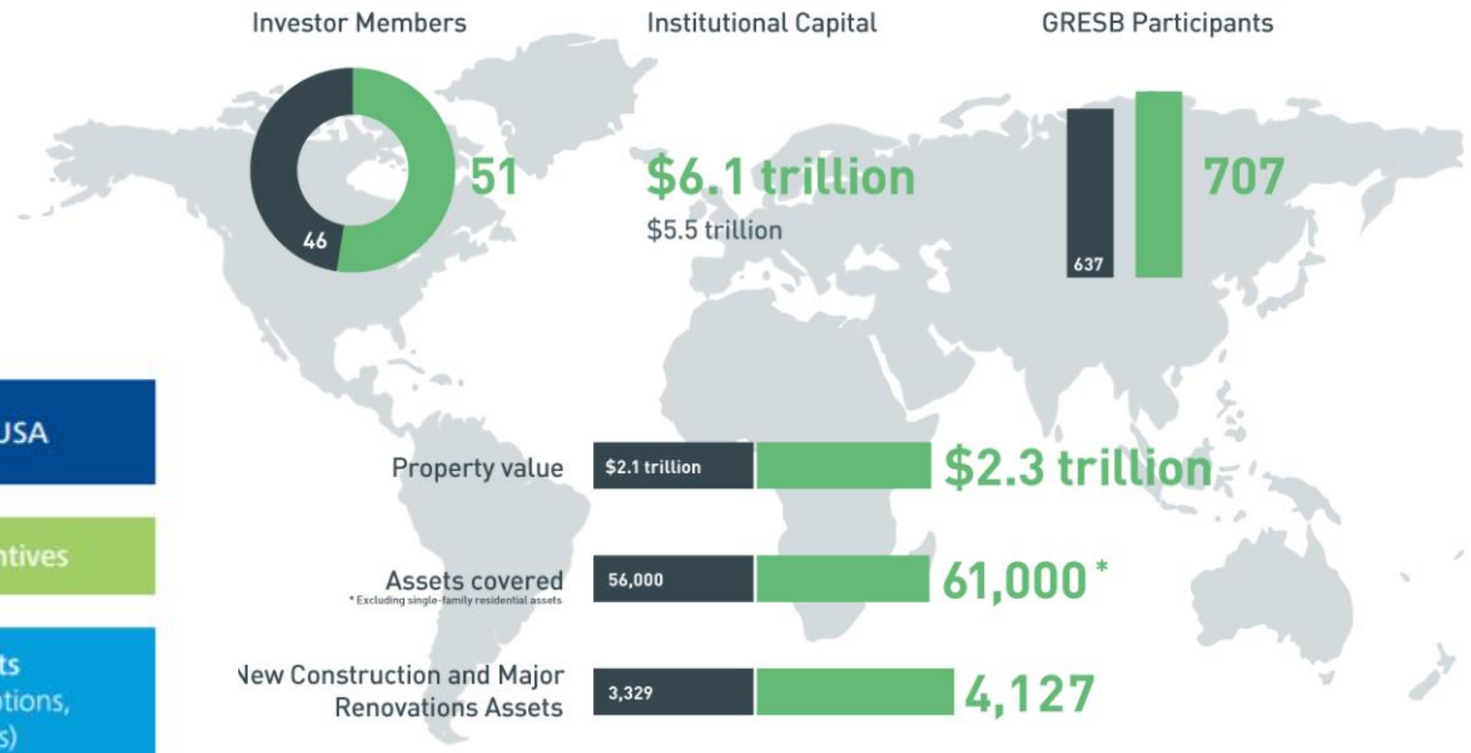
Sustainable & Green Real Estate

- Comparing policies across the globe, many countries are stepping up the sustainability drive with more stringent policies and guidelines. For instance, the UK has issued stricter energy efficiency regulations, wherein owners of buildings, which are rated below ‘E’ in the energy performance certificate (EPC), **will not be able to lease** their properties after April 2018.
- In France, the “Grenelle II Act,” legislation passed in 2012, requires owners and tenants to include environmental sustainability clauses in their existing leases to share and review the **environmental performance data** on a regular basis, collectively aiming to improve the environmental performance of the property.

Summary of government initiatives to promote sustainable buildings



Source: Deloitte Center for Financial Services Analysis



20 years ago…

Source: Cadman (2000)

Break a Cycle?

- The main idea is to break the vicious Circle by pinpointing the drivers and benefits of sustainable buildings for the Commercial Real Estate
- The specific objectives are to
  - identify the drivers and benefits of environmental sustainable buildings for the real estate investor
  - evaluate the significance of the drivers for the real estate investor
  - identify the research gaps
- Multidisclipinary literature review
  - Focusing mainly on previous research actually showing the scientific evidence, not just desribing about it
  - Focusing also to the significance of the driver for the investor

10 years ago…

The role of the built environment in the sustainability agenda has increased strongly during the past decade. For example in United States, the built environment accounts for 40% of the total energy consumption and over 38% of the total carbon dioxide emissions (e.g., CB Richard Ellis, 2007; USGBC, 2009).

- Focus is on the corporate level
- Benefits discussed in literature, empirical evidence still very limited
  - Indicates image benefits
- not able to find any evidence on other corporate level drivers

10 years ago…

- Forms trough the benefits for the tenant (better image, healthier working environment, decreased maintenance costs etc.)
- Tenants' willigness to pay has been documented through questionnaire surveys
  - how does the financial crisis effect the willigness to pay?
- Evidence of higher rent level still limited
  - studies confirming the higher rental levels have been performed on U.S. data, there is still a lack of evidence in Europe
  - Increase in rental level ranging between 2-17%

Findings on Sustainable RE

Exhibit 3
Summary of the Studies on the Property and Corporate Level Drivers of Sustainable Real Estate Investment

Author	Type of Reference	Methods	Data/Empirical Focus	Findings
Panel A: Corporate Level Driver—Image Benefits				
Davies (2005)	Industry study	12 case studies	U.S./Canada	Positive image impact
Newell (2008)	Journal article	Content analysis	Australia	Positive image impact
Panel B: Property Level Driver—Increased Rental Income				
Jones Lang LaSalle (2008)	Industry study	Survey (n = 400)	Global	70% of respondents WTP Premium
Cushman and Wakefield (2007)	Industry study	Survey (n = 825)	Europe	45% of tenant respondents WTP Premium
Cushman and Wakefield (2009)	Industry study	Survey (n = 750)	Europe	39% of tenant respondents WTP Premium
Colliers (2007)	Industry study	Survey (n = 181)	Canada	63% of respondents WTP Premium
Sayce et al. 2007	Journal article	Survey (n = 60, 100)	U.K.	33% of respondents expect impact on rent
Fuerst and McAllister (2008)	Working paper	Regression	U.S./CoStar	Higher rent (5% for LEED, 4% for ENERGY STAR)
Fuerst and McAllister (2009a)	Working paper	Regression	U.S./CoStar	Higher rent (6% for LEED, 5% for ENERGY STAR)
Eichholtz et al. (2008)	Working paper	Regression	U.S./CoStar	Higher rent (2%–3%, 6.4% for in effective rent)
Wiley et al. (2010)	Journal article	Regression	U.S./CoStar	Higher rent (7%–17%)
Pivo and Fisher (2009)	Working paper	Regression	U.S./NCREIF	Higher rent (5%)

(Falkenbach, H. 2010)

Findings on Sustainable RE

Exhibit 3 (continued)
Summary of the Studies on the Property and Corporate Level Drivers of Sustainable Real Estate Investment

Author	Type of Reference	Methods	Data/Empirical Focus	Findings
Panel C: Property Level Driver—Decreased Property Costs				
Shiers (1999)	Journal article	14 case studies	U.K.	Lower operating costs (6%–30%)
Miller et al. (2008)	Journal article	Regression	U.S./CoStar	Lower operating costs (35%)
Turner and Frankel (2008)	Industry Study	Survey (n = 121)	LEED New Construction Buildings	Energy savings on average 28%, deviations on property level significant (>50% of properties deviate more than 25%)
Pivo and Fisher (2009)	Working paper	Regression	U.S./NCREIF	Lower utilities costs (10%)
Jones Lang LaSalle (2008)	Industry study	Survey (n = 400)	Global	70% of respondents expect cost premium
Shiers (1999)	Journal article	13 case studies	U.K.	9 properties had a cost premium
Kats 2003	Working paper	33 case studies	U.S.	Cost premium (2%)
Steven Winters Associates (2004)	Industry study	Scenario analysis	U.S.	Cost premium (0%–8%)
Matthiessen and Morris (2004)	Industry study	45 case studies	U.S.	No significant cost premium
Matthiessen and Morris (2007)	Industry study	83 case studies	U.S.	No significant cost premium
Rawlinson (2007)	Industry study	1 case study	U.K.	Cost premium (6%)

(Falkenbach, H. 2010)

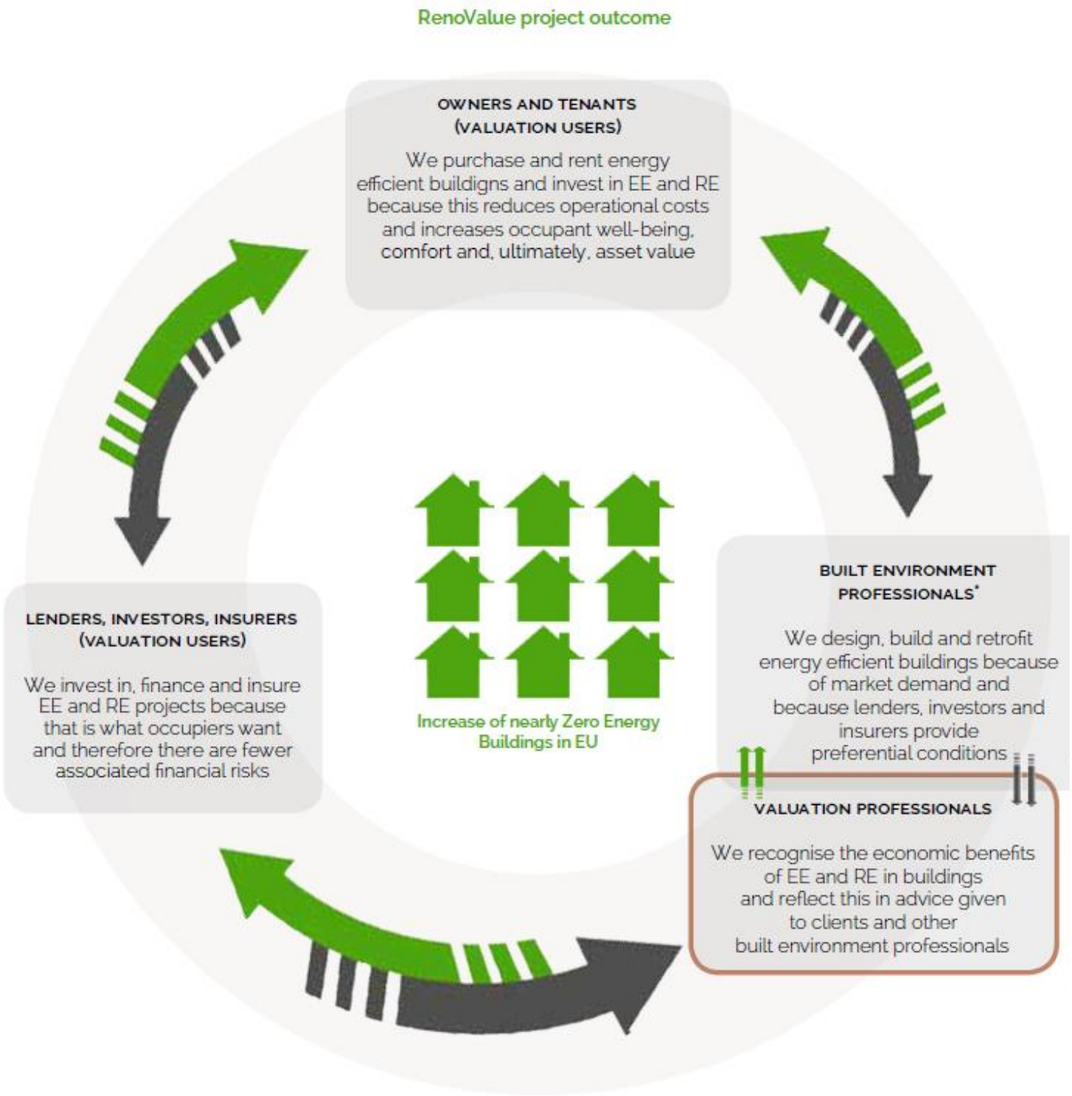
Findings on Sustainable RE

Exhibit 3 (continued)
Summary of the Studies on the Property and Corporate Level Drivers of Sustainable Real Estate Investment

Author	Type of Reference	Methods	Data/Empirical Focus	Findings
Panel D: Property Level Driver—Decreased Risks				
Fuerst and McAllister (2009b)	Working paper	Regression	U.S./CoStar	Higher average occupancy rate (8% for LEED and 3% ENERGY STAR offices)
Miller et al. (2008)	Journal article	Regression	U.S./CoStar	2%–4% higher occupancy rate for ENERGY STAR offices
Wiley et al. (2010)	Journal article	Regression	U.S./CoStar	Lower vacancy rate (10%–18%)
Pivo and Fisher (2009)	Working paper	Regression	U.S./NCREIF	Lower vacancy rate (1%)
Panel E: Property Level Driver—Increased Property Values				
Cushman and Wakefield (2007)	Industry study	Survey (n = 825)	Europe	47% of tenant respondents WTP Premium
Cushman and Wakefield (2009)	Industry study	Survey (n = 750)	Europe	44% of tenant respondents WTP Premium
Sayce et al. (2007)	Journal article	Survey (2005: n = 60, 2000: n = 100)	U.K.	23% (year 2005) and 40% (year 2000) of respondents expect impact on yield
Fuerst and McAllister (2008)	Working paper	Regression	U.S./CoStar	Higher property value (26% ENERGY STAR, 25% LEED)
Fuerst and McAllister (2009a)	Working paper	Regression	U.S./CoStar	Higher property value (31% ENERGY STAR, 35% LEED)
Eichholtz et al. (2008)	Working paper	Regression	U.S./CoStar	Higher property value (6%)
Miller et al. (2008)	Journal article	Regression	U.S./CoStar	Higher property value (5%–10%)
Wiley et al. (2008)	Journal article	Regression	U.S./CoStar	Higher property value
Pivo and Fisher (2009)	Working paper	Regression	U.S./NCREIF	Higher property value (10%–16%)

(Falkenbach, H. 2010)

Recent Researches…



Source: Hartenberger, U., Lorenz, D., 2013

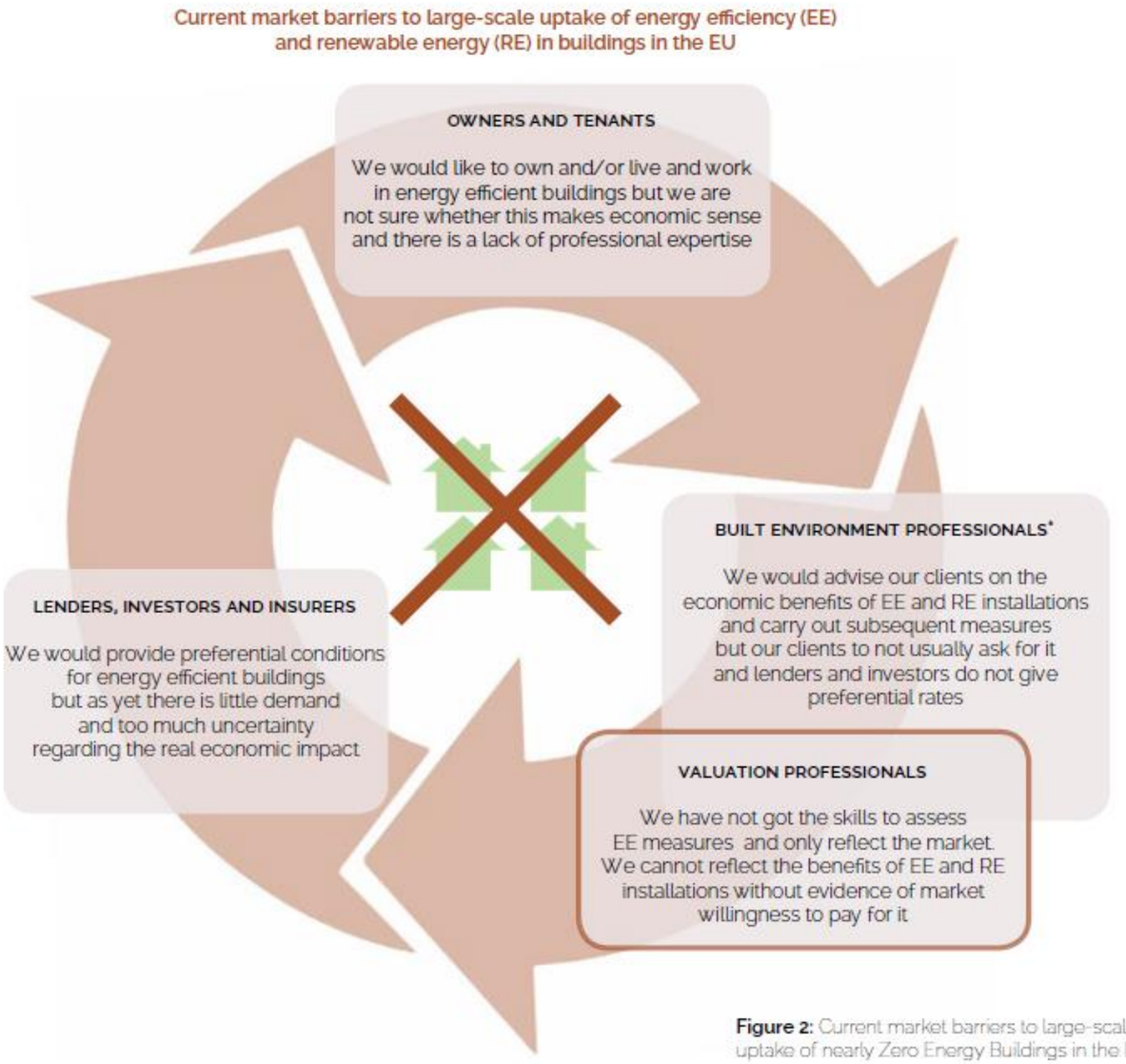


Figure 2: Current market barriers to large-scale uptake of nearly Zero Energy Buildings in the EU

Renovalue EU Project, 2016.

LEED-certified GSM space as of December 2016

Rank	Country Name	Gross Square Meters*	Number of Projects
1	China	34.62	931
2	Canada	34.39	2,586
3	India	15.90	644
4	Brazil	7.43	380
5	Republic of Korea	5.95	97
6	Taiwan	5.66	99
7	Germany	5.03	215
8	**Turkey**	**4.78**	**191**
9	Sweden	3.88	210
10	United Arab Emirates	3.64	180
	United States**	336.84	27,699

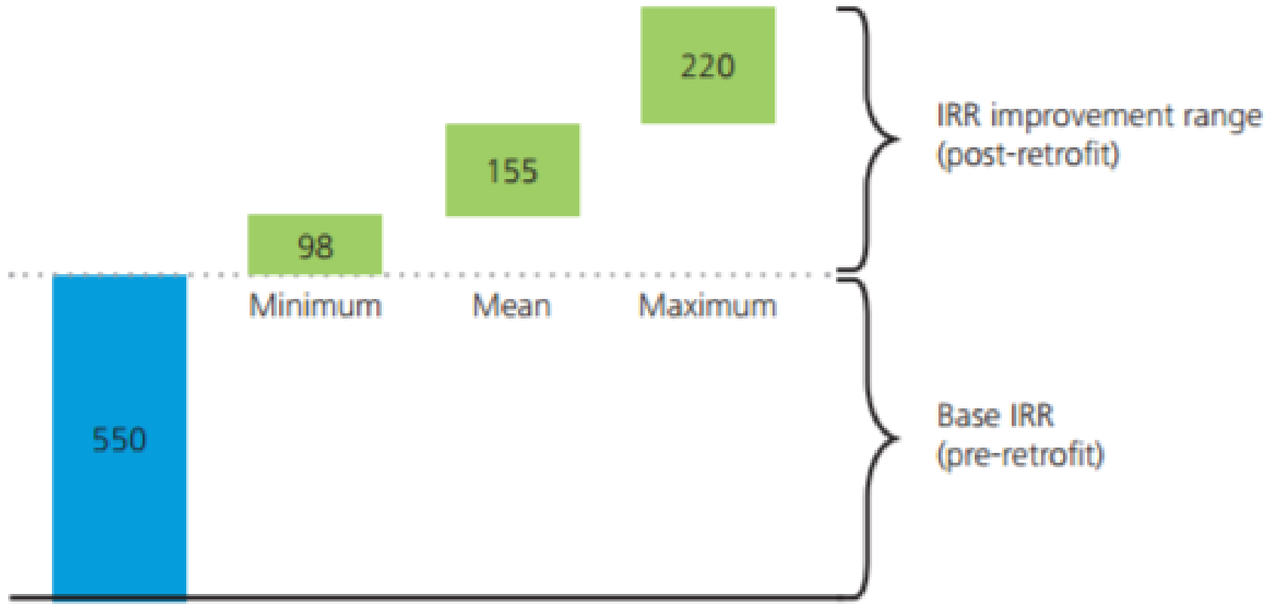
Gross square meters are reported in millions. Data reported as of December 2016.

Remarks

- Literature identifies two sources that might lead to lower risks
  - Lower risk of future obsolescence
  - Lower risk of vacancy
- Available research results are still very limited but indicate consistently lower vacancy rates for certified buildings
  - Size of effect varies markedly across studies
  - Decrease in vacancy rates ranging between 1-18%
- Risk of future obsolescence evolves from sustainable buildings becoming mainstream and from stricter future legislation
  - Extent of the risk is hard to evaluate

Remarks

Figure 7: Simulation results — IRR* improvement post-retrofit (in basis points)



*IRR represents the unlevered internal rate of return on the overall building investment.
Source: Deloitte Center for Financial Services Analysis

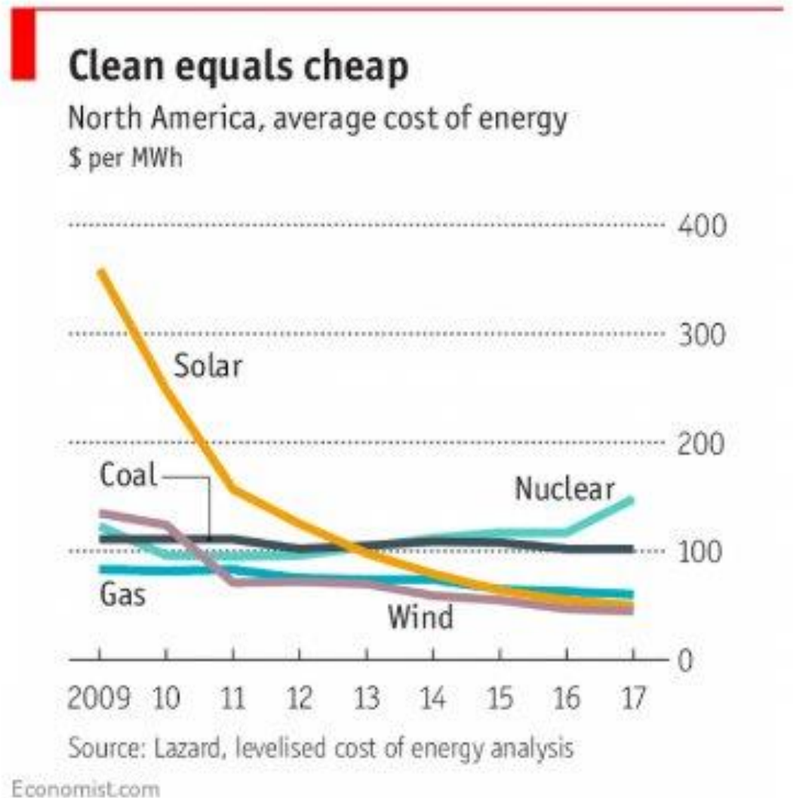
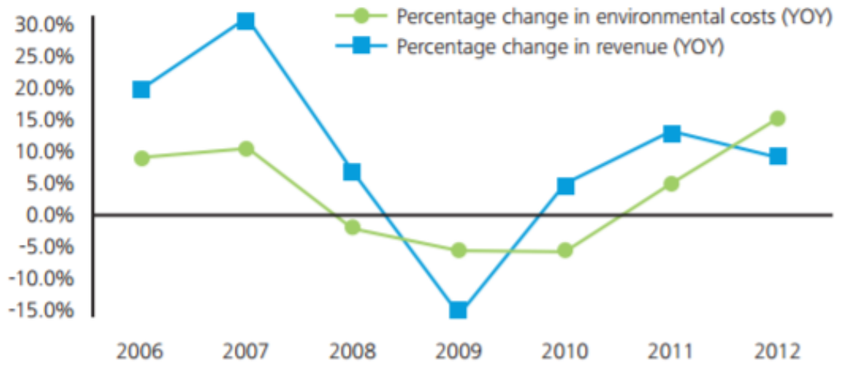


Figure 2: Change in environmental cost vs. revenue growth for real estate investment trusts (REITs)



Source: Trucost Environmental Register and Deloitte Center for Financial Services Analysis

Many thanks for your attention…

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