ESG in Real Estate

Research analysis on Environmental, Social and Corporate Governance factor materiality for private Real Estate portfolios

The objective of this research study is to analyze the financial materiality of Environmental, Social and Corporate Governance factors (ESG) for (illiquid) Private Real Estate as an asset class.

Please note: the conclusions from the research studies analysed and summarised in this report do not necessarily reflect Allianz Global Investors’ investment opinion. The research does not imply investment advice or investment performance related forecasts.

Executive summary

Objective

Following two recent independent surveys among Real Estate investment managers, more best practice standards and better reporting on ESG in private Real Estate investments are required as interest in this field is growing. The main goal of this research is to determine the materiality of ESG factors for private Real Estate investments. We look into which ESG dimension – Environmental, Social or Corporate Governance – appears most relevant, or most measurable for private Real Estate investments. In this context, we also take a look at ESG regulations and certifications. To determine the possible impact of ESG on Real Estate value, we examine several studies focused on residential as well as office buildings around the world including different samples, regions and measurements for “green financial benefits” i.e. sales and rental premia. Finally, we take a look at current best practice examples conducting interviews with private Real Estate investments experts from Allianz Real Estate and the Townsend Group.

Results

“The Environment” is the most dominant ESG Dimension for Real Estate. Buildings account for more than one third of global greenhouse gas emissions and global energy consumption and may therefore be heavily accountable for contributing to global warming and climate change. In light of this the ESG focus for Real Estate has been on the environmental dimension.

Due to a multitude of environmental regulations and certifications – both mandatory and voluntary – the environmental dimension appears to be most measurable and most relevant in terms of sustainable private Real Estate investments. For example, following the energy performance of buildings directive of the European Union (EU), the Energy Performance Certificate (EPC) is one of the mandatory building certifications in measuring a building’s promised energy performance.

In addition, there are a multitude of voluntary building certifications such as the LEED (Leadership in Energy and Environmental Design, US), BREEAM (Building Research Establishment Environmental Assessment Methodology, UK) and NABERS (National Australian Built Environment Rating System, Australia). All of these take into account a building’s energy and water efficiency as well as its proximity to public transport and its indoor environmental quality.
One of the most popular voluntary certifications for private Real Estate portfolios (as opposed to single buildings) is the Global Real Estate Sustainability Benchmark (GRESB). Conducting annual surveys collecting sustainability data from property companies and private funds, participants receive scores in two dimensions: Management and Policy as well as Implementation and Measurement.

Beyond the Environmental dimension, Social and Governance aspects should not be neglected:

- Social factors may have financial impact as well for Real Estate. For example CAPEX to be considered to make an office building accessible for handicapped or making a building healthy, safe and secure for occupants.

- Governance factors may relate to the managing standards of a developer or building company on a grassroots level including issues such as bribery and corruption. For Real Estate funds governance risks relate to the investment manager and fund guidelines.

On the reputational risk side, labour relations in service providers, community perception of Real Estate developments, tenant perception (compliance with exclusion lists) etc. are important examples.

**Green building premia tilting to brown building discounts**

In order to determine the financial relevance of ESG for Real Estate, we investigate studies measuring differences in sales prices and rents between green and non-green residential and office buildings (see table 1).

Significant green building premia exist. They seem to be decreasing over time and Brown Building discounts appear to emerge instead:

- Several studies across the world (US, UK, Netherlands, Singapore, Japan, Australia) have analyzed the existence of green premia.

- Most studies came to the conclusion that green buildings are rewarded with a positive sale and rental premia compared to non-green buildings. The reported figures range up to 17% (residential sale) and up to 26% and 12% (office sale and rent respectively).

- However, it is important to note that sale premia have been decreasing in the past years. This development might be due to increasing awareness and availability of green buildings.

Eventually, this might lead to a materialization of so-called brown discounts, i.e. discounts for non-green buildings.

- In general, existence and magnitude of price premia significantly depend on regions, in particular on climate and environmental standards. Within these differences, some studies even reported negative sale premia for residential and office buildings.

On an ESG opportunity level, low carbon funds are emerging such as the Low Carbon Workplace Fund, a partnership established in 2010 investing in refurbishments of UK office buildings.

**Better practice ESG policies of Real Estate investors:**

Leading Real Estate investors such as Allianz Real Estate and The Townsend Group have a well-defined global Real Estate investment ESG policy reflecting highest standards.

Important pillars of these Real Estate ESG policies are:

- Policies and processes describing how material ESG factors are identified and assessed on a regular basis

- Analyzing ESG (risk) trends such as climate change, regulatory trends / legislation, tenant preferences, investor sentiment

- Policies and processes describing how ESG considerations are integrated into Real Estate portfolio construction and management strategies following a full investment cycle approach covering acquisition, management and exit

- Summary of set of tools and processes to assist management of ESG risks for Real Estate such as due diligence procedures, object life-cycle audit and environmental strategy

- Reputational risk management procedures such as business partner validation and exclusion list compliance handling

- Legal and regulatory compliance handling

- Policies also distinguish specific ESG handlings for different types of investments such as Direct Real Estate Equity vs. Direct Real Estate Debt vs. Real Estate Funds
One step deeper

1. **What is the relevant dimension for Real Estate: E, S, G?**

   **Objective**

   We determine the most relevant ESG dimension and criteria for Real Estate investment decision-making. Further, we give an introduction to portfolio- and building-level certification that will turn out to have a significant impact on Real Estate value.

   **Results**

   Buildings account for more than one third of global energy consumption and greenhouse gas emissions. Therefore, environmental criteria such as energy-, water- and waste-efficiency as well as embodied carbon come up as the main focus for ESG in Real Estate. Further, as regulatory pressures on energy efficiency etc. are expected to rise in the future, the variety of mandatory and voluntary certifications both on the portfolio- and on the building-level should be taken into consideration:

   - Following the EU Energy Performance of Buildings Directive, Energy Performance Certificates (EPCs) are to be included in all advertisements for the sale or the rental of buildings. As the implementation of those mandatory certificates and the assessment of buildings under this directive vary across countries, a comparison of properties across countries might lead to difficulties.
   - The UK Energy Act 2011 provides for powers to ensure that from April 2018, it will be unlawful to rent out a residential or business premise that does not reach a minimum energy efficiency standard (the intention is for this to be set at EPC rating “E”).

The Global Real Estate Sustainability Benchmark (GRESB), an industry-driven organization, assesses the sustainability performance of Real Estate portfolios. Conducting an annual survey collecting sustainability data, portfolios are rated in two dimensions: Management and Policy as well as Implementation and Measurement.

Building certifications focus on energy efficiency and environmental impact

A variety of voluntary (national) building level certifications assess the sustainability performance of Real Estate. Three of the most famous building level certifications are the US American LEED (Leadership in Energy and Environmental Design), the British BREEAM (Building Research Establishment Environmental Assessment Methodology) and the Australian NABERS (National Australian Built Environment Rating System). Each of these certifications take several rating categories into account such as energy and water efficiency or location and transport and results in four, five and seven different rankings respectively.

While we focus on residential and office buildings throughout this study, these certifications also assess retail or logistic buildings.

The consideration and inclusion of ESG factors into industrial Real Estate investments is not analyzed as part of this research.

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Figure 1: 

Global energy consumption ³

Global CO₂ emission ³

40% Buildings

33%
Environmental factor dominant for Real Estate

Buildings account for more than one third of global energy use and greenhouse gas emissions.

Emphasis on energy efficiency

An estimated USD 300 billion of annual investment in the energy efficiency of buildings are needed to meet global climate protection goals.

Figure 2: Important ESG criteria for Real Estate investments

**Environmental**

- Energy, water and waste efficiency
- Embodied carbon
- Greenhouse gas emission
- Indoor environmental quality
- Materials and resources
- Mass urbanization
- Outdoor environmental quality and biodiversity

**Social**

- Construction working conditions incl. human rights
- Health, safety and security of building occupants
- Accessibility for disabled persons
- Location and transportation
- Mass urbanization

**Governance**

- Bribery and corruption
- Sub-contractor selection and monitoring
- Real Estate fund governance
2. Green building premia? Materiality of ESG for Real Estate

Objective
In this chapter, we determine the materiality of ESG for Real Estate by investigating several studies on this topic. In particular, we look into whether there is a green premia, i.e. if so-called green buildings are rewarded with a sale and / or rental premia.

The US Green Building Council defines green buildings as the planning, design, construction, and operations of buildings with several central, foremost considerations: energy use, water use, indoor environmental quality, material section and the building's effects on its site. See figure 5 and green building examples Allianz in the appendix. As opposed to that, code-compliant buildings are non-green buildings meeting local or national regulations. Brown buildings are non-green buildings not meeting local or national regulations.

Results
As basis of this research we analyze 7 selected scientific studies (see Table 1). Several studies across the world (US, UK, Netherlands, Singapore, Japan, Australia) discussed the existence of green premia. We investigate studies measuring differences in sale prices and rents between green and non-green residential and office buildings. For voluntary certifications such as LEED, NABERS etc., these studies compared certified buildings to non-certified buildings. For mandatory certifications such as EPC, high-rated buildings were compared to low-rated buildings.

Most studies came to the conclusion that green buildings are rewarded with a positive sale and rental premia compared to non-green buildings. The reported figures range up to 17% (residential sale) and up to 26% and 12% (office sale and rent respectively). See figures 3 and 4 on page 7.

However, it is important to note that sale premia have been decreasing in the past years. This development might be due to increasing awareness of green buildings. Eventually, this might lead to a materialization of so-called brown discounts, i.e. discounts for non-green buildings.

In general, the existence and magnitude of price premia significantly depend on regions, in particular on climate and environmental criteria. Within these differences, some studies even reported negative sale premia for residential and office buildings.

In Tokyo, the green premia of a residential building is initially negative and increases with rising building age. This is due to higher construction costs and lower depreciation rates of green buildings compared to non-green buildings. Further, long-life design is associated with a price premia as long-life design is especially effective in Japan, where residential structures have relatively short economic lives.

In Australia, there is evidence of so-called brown discounts for office buildings, i.e. non-green (low-rated) buildings having a lower value compared to green (median- and high-rated) buildings. These so-called brown discounts are expected to further emerge in the future.

- "...many major markets will reach the critical mass where green buildings account for enough of the building stock that tenants have a choice. At this point, the performance premia for green buildings will flip to a discount for older, less efficient, conventional buildings. We are already at or near this point in the mature economies of Europe and developed Asia, and getting closer in the major money centers of the United States.”

- “Regulation for minimum energy efficiency standards could impact market value and investment worth of buildings, since increasingly buildings which do not meet an "E" on the EPC scale will face obsolescence. This could result in a 'brown discount', where the worst performing buildings will be less attractive to owners and occupiers until their energy efficiency is addressed.”

Besides the awareness of emerging brown discounts and the need to determine the extent of brown discounts for non-certified properties, further lessons regarding ESG in Real Estate have been learnt:

- There is a need for greater transparency and consistency of approach in order to minimize any perceived risks of devaluation or of decreasing expected benefits from the inclusion of sustainability features on building projects.

- More data is needed on the impact not just of certification, but of individual measures or strategies, and how they are perceived by appraisers. Existing studies for rental and occupancy rates in particular are based on small sample sets and need to be built up to increase their reliability and robustness.

- The industry needs to gain a better understanding of the implications of changes in the ratio of certified versus non-certified buildings, the trend in legal requirements to upgrade buildings and other external factors related to political, economic and environmental issues, all of which will impact the asset value of both green and non-green buildings.

- Investors need to understand the implications of regulatory and climate change and factor this into sustainability risk assessments for the development, ownership and occupancy of buildings.

- Building owners need to appreciate occupier preferences for ‘green’ buildings, particularly which ‘green’ features appeal to them.

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Table 1: Overview of research studies analyzed

<table>
<thead>
<tr>
<th>Author/Source</th>
<th>Year</th>
<th>Sample period</th>
<th>Location</th>
<th>Segment</th>
<th>Sample size (number of objects)</th>
<th>Scheme</th>
<th>Sales yields/rental yields</th>
<th>Price increase/decrease</th>
<th>Magnitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuerst, McAlister, Nanda, Wyatt</td>
<td>2013</td>
<td>1995-2011</td>
<td>UK</td>
<td>Residential</td>
<td>325,950</td>
<td>EPC</td>
<td>Sales</td>
<td>Positive</td>
<td>6-14%</td>
</tr>
<tr>
<td>Kok, Kahn</td>
<td>2012</td>
<td>2007-2012</td>
<td>US</td>
<td>Residential</td>
<td>1,604,879</td>
<td>Energy Star, GreenPoint Rated, LEED</td>
<td>Sales</td>
<td>Positive</td>
<td>9%</td>
</tr>
<tr>
<td>Deng, Li, Quigley</td>
<td>2012</td>
<td>2000-2010</td>
<td>Singapore</td>
<td>Residential</td>
<td>74,278</td>
<td>Green Mark</td>
<td>Sales</td>
<td>Positive</td>
<td>4% (to 11%)</td>
</tr>
<tr>
<td>Yoshida, Sugiura</td>
<td>2014</td>
<td>2002-2010</td>
<td>Japan</td>
<td>Residential</td>
<td>41,560</td>
<td>Tokyo Green Building Program</td>
<td>Sales</td>
<td>Mixed</td>
<td>-5 to +17%</td>
</tr>
<tr>
<td>Kok, Jennen</td>
<td>2012</td>
<td>2005-2010</td>
<td>Netherlands</td>
<td>Office</td>
<td>1,072</td>
<td>EPC</td>
<td>Rents</td>
<td>Positive</td>
<td>-1% to +9%</td>
</tr>
<tr>
<td>Newell, MacFarlane, Walker</td>
<td>2014</td>
<td>2011</td>
<td>Australia</td>
<td>Office</td>
<td>366</td>
<td>NABERS</td>
<td>Both</td>
<td>Mixed</td>
<td>-1% to +7%</td>
</tr>
</tbody>
</table>

On average, green buildings are rewarded with a positive sale and rent premia compared to non-green buildings. Allianz Global Investors, 2015.
Explanation:

**Maximum green sale premia for residential buildings.**

The sale price premia was measured as the difference in sale prices between labeled and non-labeled buildings within the voluntary certificates (US, Singapore, Japan) and between high-rated and low-rated buildings within the mandatory certificates (UK).

**Maximum green sale and rental premia for office buildings.**

The sale price premia was measured as the difference in sale prices between labeled and non-labeled buildings within the voluntary certificates (US, Australia) and between high-rated and low-rated buildings within the mandatory certificates (Netherlands).

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This is for guidance only and not indicative of future results.
How green buildings investments influence value creation

There are a variety of factors that influence a building’s value such as the building’s location. Recent studies have shown though that “green buildings” tend to achieve better rental and occupancy rates as well as higher sales prices than “non-green assets”. However, this effect is different across regions and seems to diminish in the last years.

Based on the unique conditions of each market the magnitude of the financial benefits may vary depending on other influencing factors.

Summary of research findings for several studies

A. There is evidence of an - in general - positive cost premia which seems to be proportional to the certification level. However, some studies report an almost zero or even negative cost premia.

B. There is evidence that operational cost savings exceed any cost premia associated with green building design and construction.

C. There is evidence of an in general positive but volatile rental premia for green-labeled buildings. However, the shift of regional focus in these studies is important to note.

D. There is evidence of an in general positive but recently decreasing occupancy rate difference compared to conventional code-compliant buildings.

E. There is evidence of an in general positive but recently decreasing sale premia for green-labeled buildings. However, some studies report a negative sale premia.

Based on the unique conditions of each market the magnitude of the financial benefits may vary depending on other influencing factors.

What is a ‘Green Building’?

The US Green Building Council defines a green building as “the planning, design, construction and operations of buildings with several central, foremost considerations: water use, energy use, material section, indoor environmental quality and the building’s effects on its site”.

Code-compliant buildings are non-green buildings that meet local or national regulations.

Various sources report positive cost premia, i.e. differences in design and construction costs for green buildings compared to conventional code-compliant buildings.

The figures range from -0.4% to 12.5% and seem to be quite constant over time; no significant trend is observable.

The cost premia seem to be proportional to the increased level of environmental certification. Higher levels of certifications (such as BREEAM Very Good, LEED Silver/Gold and Green Mark Gold/Gold Plus) range from 0 percent to 10 percent while highest levels of certifications (such as BREEAM Excellent, LEED Platinum, Green Mark Platinum) range from 2% to 12.5%.

It is important to note that the regional scope of the sample analyzed has shifted over time:

- 2000 to 2004: main focus US
- 2004 to 2012: UK

However, the figure ranges are reasonably consistent across those countries.

The baseline of the studies consists of code-compliant building and is therefore highly dependent on national building regulations.

- The investigated countries benefit from strong green building councils driving the national green building agenda; consequently the gap between a code-compliant building and a green building had been narrowing.
- Countries with less emphasis on the green agenda might find higher cost premia for green buildings compared to conventional code-compliant buildings than those presented.
Reported cost premia associated with LEED certifications illustrate a gradual trend towards reduction in cost premia over time. However, cost premia associated with LEED certified levels have risen from 2007 to 2011.\(^9\)

Further, the proportionality of cost premia to certification levels is demonstrated.

There are several reasons supporting this trend towards cost premia reduction over time:

- The building industry has been steadily developing its capability for delivering green buildings.
- There is increasing awareness, acceptance and education around green building certification and assessment tools leading to more and more professionals becoming well-equipped to design and certify green buildings.
- Clients are increasingly aware of sustainability and energy issues and demand more expertise from industry and collaborative teams.
- Minimum standards for building code are progressively becoming stricter, hence baseline requirements and associated costs are progressively getting higher, and therefore narrowing the gap between the cost of code-compliant buildings and the cost of green buildings.


The main benefits of green buildings include reduced energy costs from heating, cooling, ventilation, lighting and reduced water consumption.

A 2003 study reported reduced energy use for LEED rated buildings compared to conventional code-compliant buildings of 18%, 30% and 37% for LEED Certified, LEED Silver and LEED Gold rated buildings respectively. It is important to note that since these results are based on 2003 data, the figures may no longer be valid. However, the trend of greater energy reductions corresponding to higher certification levels should still be valid.

Further benefits, such as reduced operational costs and maintenance requirements, require effective green building management procedures to be put in place prior to the building’s occupation.

In addition, green buildings potentially offer indirect benefits related to reductions in property taxes, insurance rates and refurbishment costs.

As energy prices rise, the relative benefits of energy efficiency will become increasingly important and the business case for energy-efficient buildings will strengthen et. vice versa.

A 2003 study found that operational cost savings exceed any cost premia associated with green building design and construction. It is important to note that since this graph is based on 2003 data, these values may no longer be accurate due to economic changes.
C. No significant trend in rental premia  

Various sources report positive rental premia for green-building compared to conventional code-compliant buildings in Australia, the UK and the US.

No significant trend is observable throughout the overall quite volatile research results. However, it is important to note that the regional focus has shifted in the past years.

One result shows a negative rental premia. This discount is associated with lower NABERS performance levels. However, higher NABERS performance levels are linked with a positive rental premia.

D. Occupancy rate for green buildings higher but decreasing effect  

Various sources report increasing occupancy rate for green buildings compared to conventional code-compliant buildings.

However, occupancy rate differences between green buildings and conventional code-compliant buildings seem to have been decreasing in recent years. This decrease might be due to a general increased awareness of green building.

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Sale premia for green buildings decreasing in the past years

Various sources report sale price increases for green-building compared to conventional code-compliant buildings around the world (UK, US, Singapore, Australia, Japan, Netherlands).

However, sale premia have been decreasing in the last years. This decrease might be due to an increased awareness of green building in general.

Two studies even find negative sale premia.

In the Australian case, this discount is associated with lower NABERS performance levels (while higher NABERS performance levels are rewarded with a positive price premia).

In the Japanese case, one potential reason for this discount might be the prevalence of highly-efficient appliances and equipment in Japan. On the other hand, long-life design is associated with a positive price premia.

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3. Better practice: ESG policies for Real Estate Investors

Objective

We investigate and summarize ‘policy and process best practices’ regarding the integration of ESG into Real Estate investment decisions and investments.

We give examples of how investors can include ESG criteria into their asset and portfolio management decisions and thereby aim to achieve financial benefits on their Real Estate investments.

Results

The 2012 UNEP FI Responsible Property Investment (RPI) report describes current best practices on how to integrate ESG into the property investment process:

- The ESG framework is defined in order to set minimum standards for asset selection, for asset allocation and portfolio management

- Real Estate asset managers’ best practice ESG policies focus on the identification, analysis and management of ESG. The impact of ESG criteria are analyzed on an asset and portfolio level all through-out the investment process:
  - Life-cycle based ESG Real Estate analysis (buy, manage and exit / sale ESG analysis)
  - Including due diligence of business partners and funds
  - ESG risk based audits and annual reporting such as GRESB

Policies should differentiate and adjust for the various types of real investments:

- (Direct) Private Real Estate Equity
- (Direct) Private Real Estate Debt
- Fund-Based Real Estate Investments

UNEP FI Responsible Property Investment Report

The 2012 report “Responsible Property Investment – What the leaders are doing” by the United Nations Environment Programme Finance Initiative (UNEP FI), a strategic public-private partnership between the United Nations Environment Programme (UNEP) and about 200 financial institutions, describes current ESG best practices in Responsible Property Investment (RPI).

In the simplest sense, RPI is the integration of ESG criteria into investors’ decisions regarding Real Estate.

Source: http://www.unepfi.org/work-streams/property/rpi/ ; UNEP FI, 2012: Responsible Property Investment – What the leaders are doing.
Asset manager example: Best practice Real Estate ESG policy

Goals

1. Provide investors with outstanding performance
2. Take ESG considerations into account in any investment decision to enhance returns and to preserve value

- Checklist approach throughout due diligence process to identify ESG risks and opportunities currently or potentially materializing over the investment horizon
- Consideration of risks and opportunities in asset pricing, effective management and acquisition
- Inclusion of external advisors where specialist skills or technical knowledge is required
- Validation of business partners using ESG exclusion lists
- Active management:
  - Environmental strategy (using environmental certification schemes)
  - Best standard monitoring
  - Tenant satisfaction survey
  - Property specific risk assessment
  - Support and education of partners on ESG issues
  - Annual report containing sustainability and management of ESG issues ...

Source: Allianz Real Estate, 2015.
Appendices

APPENDIX 1: Environmental standards and tools

EU Energy performance building directive

European Union energy performance of buildings directive (implementation in 2003, recast in 2010)

The goal is to promote energy performance improvements in buildings: “Member states shall ensure that, when buildings are constructed, sold or rented out, an energy performance certificate is made available to the owner or by the owner to the prospective buyer or tenant.” (Article 7, Energy Performance of Buildings Directive, EU, 2009)

Target

All new buildings must be nearly zero energy buildings by 2020. EU countries must set minimum energy performance requirements for new buildings, for the major renovation of buildings and for the replacement or retrofit of building elements.

Implementation of national energy performance certificates (EPCs)

Aspiration Practice

Energy performance certificate shows a building’s promised energy use. 12

Display energy certificate shows a building’s energy use in practice. 13

Figure 13: Mandatory environmental assessment tool for Real Estate across the EU

Voluntary environmental assessment tools for Real Estate

<table>
<thead>
<tr>
<th>Country</th>
<th>Certification schemes</th>
</tr>
</thead>
</table>
| USA     | • LEED Leadership in Energy and Environmental Design  
         | • Energy Star         |
| Europe  | • BREEAM Building Research Establishment Environmental Assessment Methodology  
         | • DGNB: Gesellschaft für Nachhaltiges Bauen (Germany)  
         | • HQE: Haute Qualité Environnementale (France)         |
| Australia | • BREEAM Building Research Establishment Environmental Assessment Methodology  
           | • NABERS National Australian Built Environment Rating System  
           | • GreenStar                                              |
| Asia    | • Tokyo green building Program (Tokyo)  
         | • Singapore Green Mark Program (Singapore)  
         | • CASBEE Comprehensive Assessment System for Built Environment Efficiency |

There exists a broad variety of certifications measuring Real Estate sustainability. This leads to challenges comparing sustainability objectively unless one common standard is applied.

Environmental assessment tools in Europe

- The number of certifications of commercial buildings in Europe has notably increased from 2012 to 2013.
- The decrease of HQE certifications has been due to new regulations in France.
- The age of the certification system seems to play an important role. BREEAM has been introduced in 1990 and is more established in its home country (UK) than the other certification systems in their home countries.
- It is important to note that apart from these certification so-called ‘Certificates in Use’ certifying existing buildings – e.g. BREEAM in Use, HQE-Exploitation, and LEED-EBOM – have been increasing in the past years.

Table 2: Building level certification

<table>
<thead>
<tr>
<th>Categories</th>
<th>LEED (Leadership in Energy and Environmental Design)</th>
<th>BREEAM (Building Research Establishment Environmental Assessment Methodology)</th>
<th>NABERS (National Australian Built Environment Rating System)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy and atmosphere</td>
<td>Energy</td>
<td>Energy</td>
<td></td>
</tr>
<tr>
<td>Water efficiency</td>
<td>Water</td>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Location and transportation</td>
<td>Transport</td>
<td>Commuter transport</td>
<td></td>
</tr>
<tr>
<td>Waste</td>
<td>Waste</td>
<td>Waste</td>
<td></td>
</tr>
<tr>
<td>Indoor environmental quality</td>
<td></td>
<td>Indoor environment</td>
<td></td>
</tr>
<tr>
<td>Innovation</td>
<td></td>
<td>Innovation</td>
<td></td>
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<tr>
<td>Materials and resources</td>
<td></td>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Sustainable sites</td>
<td></td>
<td>Land use and ecology</td>
<td></td>
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<tr>
<td>Integrative process</td>
<td></td>
<td>Management</td>
<td></td>
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<tr>
<td>Regional priority credits</td>
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<tr>
<td>Health and wellbeing</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pollution</td>
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</tbody>
</table>

| Ranking                             |                                                     |                                                                             |                                                             |
| Platinum: 80+ Points                | Outstanding: 85+ %                                  | 6 Star: market leading                                                      |
| Gold: 60-79 Points                  | Excellent: 70-85 %                                   | 5 Star: excellent                                                          |
| Silver: 50-59 Points                | Very Good: 55-70 %                                   | 4 Star: very good                                                          |
| Certified: 40-49 Points             | Good: 45-55 %                                        | 3 Star: good                                                               |
| Pass: 30-45 %                       |                                                     | 2.5 Star: median                                                           |
|                                        |                                                     | 2 Star: below average                                                      |
|                                        |                                                     | 1 Star: poor                                                               |

Portfolio level certification: GRESB

About GRESB
The Global Real Estate Sustainability Benchmark (GRESB) is an industry-driven organization committed to assessing the sustainability performance of Real Estate portfolios (public, private and direct) around the globe. It was founded in 2009.

Aim
GRESB’s aim is to provide an assessment of ESG performance of Real Estate portfolios that can be used as a benchmark in order to encourage shifts towards more economically efficient Real Estate investments.

Method
GRESB conducts an annual survey collecting sustainability data from property companies and private funds.

Rating
The survey includes seven sustainability aspects.

Dimensions
The total GRESB score is divided into two dimensions:
- Management & Policy (MP): The means by which a company or fund manages sustainability in its organization, portfolio and stakeholders and the principles of action adopted by the company/fund.
- Implementation & Measurement (IM): The process of executing a decision or plan, or the act of measuring something related to the portfolio. A participant’s score for Implementation & Measurement comprises two-thirds of the total GRESB score.

New: GRESB debt
Starting in 2015, GRESB serves institutional investors in Real Estate debt, applying similar methodology and benchmarking to enable institutional investors to extend ESG integration to their Real Estate debt investments. The GRESB Debt Survey assesses the sustainability engagement and performance of Real Estate lenders. By capturing the ESG performance of Real Estate managers through the GRESB Survey, and lenders by way of the GRESB Debt Survey, GRESB serves the full spectrum of Real Estate capital providers.

Figure 16: Rating sustainability aspects

GESB Scoring

Participants will receive a score for both dimensions, and will be plotted in GRESB’s quadrant model. A participant’s position in the GRESB quadrant model explains how far it has progressed in integrating sustainability into its portfolio.

**Green Starters:** participants with a score of less than 50 on MP and a score of less than 50 on IM

**Green Talk:** participants with a score equal or larger than 50 on MP and a score of less than 50 on IM

**Green Walk:** participants with a score of less than 50 on MP and a score equal or larger than 50 on IM

**Green Stars:** participants with a score equal or larger than 50 on MP and a score equal or larger than 50 on IM

From 2013 to 2014, the overall GRESB score has increased by 9 points to 47 points. This change is mainly driven by a 23% increase in IM counteracting an 1% decrease in MP.

These changes reflect the combined effect of multiple developments:

- In 2014, GRESB had 156 first-time participants having a lower score than the average participant.
- GRESB has changed some survey questions, introduced scoring of qualitative questions, and evaluated the presence of documentary evidence for some questions.
- Many participants have started to implement sustainability programs and improvements.
- While the number of property companies and funds participating in the GRESB survey has increased by 17% compared to 2013 and by 44% compared to 2012 to a total of 637 in 2014, the proportion of participants in each quadrant has changed.

**Figure 18: Change of proportion of participants in each quadrant from 2013 to 2014**

**Figure 17: GRESB Global average scores (2011 - 2014)**

Source: [https://www.gresb.com](https://www.gresb.com).
APPENDIX 2: ESG Surveys Alternative Investments

Climate change and water scarcity as top environmental issues

AI Survey 2015

The most important environmental issues among alternative investors

Human rights and child labor as top social issues

AI Survey 2015

The most important social issues among alternative investors

Bribery and corruption as top governance issues
AI Survey 2015

North America
- Board quality
- Accounting practices
- Bribery and corruption

Europe
- Bribery and corruption
- Accounting practices
- Board quality
- Political contributions

Asia
- Bribery and corruption
- Accounting practices
- Board quality

Australia
- Board quality
- Accounting practices
- Bribery and corruption

APPENDIX 3: Surveys ESG in Real Estate

Emerging trends on ESG and alternative investments including Real Estate

Results of ESG in alternative investing survey 2015 for Europe

- Focus on ESG is expected to increase: Many respondents in the early stages of embedding responsible investing principles expect a greater focus on ESG in the future.
- There is a growing interest in reporting on ESG: Among those with established processes for incorporating ESG considerations, a majority state their intent to establish more formal ESG reporting.
- Best practice standards could improve ESG uptake: More than half of respondents believe that their current approach to ESG issues would be significantly improved through greater clarity on techniques and strategies for ESG incorporation.

Growing interest in ESG requires more best practice standards and ESG reporting.

Emerging ESG trends Real Estate investors

Results of emerging trend in Real Estate survey 2015 for Europe

- Regulations and rapidly approaching energy efficiency targets have brought the green agenda into sharp focus.
- Approx. 70% of respondents have adopted sustainability in their Real Estate business strategy, and 74% are preparing Real Estate portfolios to make them more sustainable.
- Many investors are convinced that sustainability is synonymous with good business.
- “Climate, energy and building regulations bring about obsolescence and depreciation faster than anticipated. Investment in operations, maintenance and refurbishment needs to be in tune with these changes.”

It is assumed that regulatory and market pressures will increasingly reward high-performance buildings.

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## APPENDIX 4: Research studies financial materiality of ESG in Real Estate

### A. UK: Value premia of up to 14%

<table>
<thead>
<tr>
<th>Study</th>
<th>Fuerst et al., 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>325,950 buildings EPC rated A-G (UK, 1995-2011)</td>
</tr>
<tr>
<td>Methodology</td>
<td>Comparison between EPC A-F rated and EPC G rated buildings</td>
</tr>
</tbody>
</table>

**Findings**
- There is a positive relationship between energy rating and sale price per square meter.
- The price difference (compared to EPC G rated buildings) increases with improving EPC performance.
- The price effects of superior energy performance tend to be higher for terraced buildings compared to (semi-) detached buildings.

### B. US: Labeled homes sell for 9% more than non-labeled homes

<table>
<thead>
<tr>
<th>Study</th>
<th>Kok, Kahn, 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>1.6 million single-family homes (US: California, 2004-2012)</td>
</tr>
<tr>
<td>Methodology</td>
<td>Comparison between labeled and non-labeled buildings</td>
</tr>
</tbody>
</table>

**Findings**
- Labeled homes sell for 9 percent more (+/- 4%) than comparable non-labeled homes.
- The resale premia changes considerably from region to region and is highest in areas with hot climate.
- The resale premia is correlated to the environmental ideology of the area.

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23 As measured by the number of registrations of hybrid vehicles. Please note: This is for guidance only and not indicative of future results.
### C. Singapore: Labeled buildings sell for 11% more than non-labeled

<table>
<thead>
<tr>
<th>Study</th>
<th>Deng et al., 2011</th>
<th>Economic returns to energy-efficient investments in the housing market: Evidence from Singapore</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>74,278 buildings (Singapore: 2000-2010) 18,296 green-labeled under the Singapore Green Mark Program</td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td>Comparison between labeled and non-labeled buildings</td>
<td></td>
</tr>
</tbody>
</table>

#### Findings
- There is a positive relationship between energy rating and sale price per square meter.
- The price difference (compared to non-labeled buildings) increases with improving label (Platinum, Gold Plus, Gold).

#### Data
- Platinum: 3.07%
- Gold Plus: 20.74%
- Gold: 56.62%
- Certified: 19.57%

#### Methodology
- Comparison between labeled and non-labeled buildings

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### D. Japan: Initial negative premia gets positive after one year

<table>
<thead>
<tr>
<th>Study</th>
<th>Yoshida, Sugiura, 2014</th>
<th>The Effects of Multiple Green Factors on Condominium Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>11,933 buildings (Japan: Tokyo, 2002-2010) 1,452 green-labeled under the Tokyo Green Building Program</td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td>Comparison between labeled and non-labeled buildings</td>
<td></td>
</tr>
</tbody>
</table>

#### Findings
- The initial green premia can be negative but becomes positive as the building ages (due to slower depreciation rate of green buildings).
- Longer-life design is associated with a price premia.
- Use of renewable energy and recycled materials and water is associated with a price discount (due to high marginal costs for improving energy efficiency).

#### Methodology
- Comparison between labeled and non-labeled buildings

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Please note: This is for guidance only and not indicative of future results.
E. US: Sale premia is higher than rent premia

| Study                      | Fuerst, McAllister, 2011  
|                           | Green Noise or Green Value? Measuring hat Effects of Environmental Certification on Office Values |
| Data                      | 16,000+ office building rents  
|                           | 834 Energy Star, 197 LEED certified  
|                           | 9,000+ office building sales prices  
|                           | 559 Energy Star, 127 LEED certified  
|                           | (US, 1999-2010) |
| Methodology               | Comparison between labeled and non-labeled buildings |

**Findings**
- The sale premia of office buildings is higher than the rent premia.
- This difference is possibly due to combined effects on capital value of higher rental income, lower operating costs, increased occupancy rates, image benefits and a lower risk premia.

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F. Netherlands: Access to public transport and facilities is rewarded

| Study                      | Kok, Jennen, 2012  
|                           | The Impact of Energy Labels and Accessibility on Office Rents |
| Data                      | 1072 buildings EPC rated A-C (Netherlands, 2005-2010) |
| Methodology               | Comparison between EPC A-C rated and EPC F-G rated buildings |

**Findings**
- On average, a less efficient “non-green” building (rated D-G) achieves a 6.5% lower rent as compared to a similar “green” building (rated A-C).
- Office buildings in multi-functional areas with access to public transport and facilities achieve rental premia compared to mono-functional areas.

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**Evidence of impact of social factor**
G. Australia: Especially high premia in Canberra

<table>
<thead>
<tr>
<th>Study</th>
<th>Newell et al., 2014 Assessing energy rating premia in the performance of green office buildings in Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data</td>
<td>366 buildings (Australia, 2011) 206 NABERS certified</td>
</tr>
<tr>
<td>Methodology</td>
<td>Comparison between labeled and non-labeled rated buildings</td>
</tr>
</tbody>
</table>

**Findings**

- There is evidence of value premia in higher rated NABERS categories and value discounts in lower rated NABERS categories.
- Comparably high premia in Canberra might be due to mandatory energy rating requirements for tenanting offices.
- Energy rating premia were generally evident in reduced vacancy, reduced outgoings, reduced incentives and reduced yields.

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Please note: This is for guidance only and not indicative of future results.
**Green building examples**

**Allianz France Acacia (La Défense)**

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**Driving energy consumption in buildings downwards**

Reducing greenhouse gas emissions from buildings (the 2nd biggest source accounting for 34% of all emissions) means reducing energy consumption and, where possible, replacing fossil fuels with renewable energy or energy from sources that generate lower emissions.

To reduce energy consumption Allianz France is focusing on several areas:

- Improving the energy efficiency of buildings
- Optimising building use in terms of management
- Raising the awareness of building occupants in good practices for energy use
- Making information technology more energy efficient

The main operational buildings accommodating 80% of Allianz France employees have significantly reduced their energy consumption through a number of initiatives:

- The closure of several less energy-efficient sites
- Special focus on management and control of energy use by service providers using the buildings, with special measures included in maintenance contracts
- Research into energy control products

With regard to the last point, two products have been rolled out on a test basis, one at the Acacia site in La Défense and the other in the Lyon building. In each case the approach taken is based on real time supervision of fluid consumption (electricity, gas, urban heating and cooling networks, and later) and of building heat behavior models.

The changes in the energy needs of the sites can be tracked by reference to climate variations. These variations are taken into account via a UDD (Unified Degree Days base 18) calculation, which in particular represents heating needs depending on the weather.

The almost immediate detection of anomalies (leaks, over-consumption at night or weekends) and the highlighting of differences with the benchmark levels mean the building’s operation can be optimised. Better use of building management systems will help improve performance.

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<table>
<thead>
<tr>
<th>Site</th>
<th>Energy control Solutions/ Provider</th>
<th>Date of implementation</th>
<th>Reduction in the site’s energy need in kWh / occupant / UDD since implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia (La Défense)</td>
<td>ERGELIS</td>
<td>December 2011</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Lyon</td>
<td>UBIGREEN</td>
<td>November 2011</td>
<td>&gt; 20%</td>
</tr>
</tbody>
</table>

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Allianz Germany Unterföhring

The buildings in Unterföhring, Allianz Germany’s largest site worldwide with approximately 6800 employees, have been aligned with Environmental Protection Guidelines. Based on this, Allianz Germany achieved high energy savings in 2014:

- Electricity production: with the aid of photovoltaic panels covering an area of 532m² on the south façade, approx. 18,500 kWh renewable energy was produced in 2014. Since the panels were installed, they have supplied around 368,000 kWh renewable energy to the building.
- The heat produced by nearby data centers is used to heat the company building and the two administrative buildings. The use of waste heat enabled 11,900,000 kWh (which would otherwise have been used for generating heat) to be saved in 2014. This corresponds to 78% of the heating requirements for the 3 buildings at Unterföhring. The savings in district heating as a result of using waste heat total around 174,000,000 kWh since its installation.

In addition to reducing the amount of energy and resources consumed, the use of renewable energy sources has been a key element of this plan. The most relevant measure is the switch to hydro-electric power. Already since 2010, all large Allianz Germany premises have been supplied with 100% hydro-electric power.

Allianz Tower Jakarta

Allianz has made an eye-catching commitment to sustainability in design with the new 28-storey Allianz Tower in the central business district of Jakarta. The Tower serves as the headquarters of all Allianz’ Indonesian operations since 2012. This striking landmark in downtown Jakarta incorporates many aspects of environmental sustainable design, including:

- Building orientation: Designed to be slimmest on the east and west facades to reduce heat and UV radiation.
- Natural water absorption: Thanks to the Tower’s minimal footprint 70 percent of the site functions as a natural rainwater absorber to reduce the flooding risk in Jakarta.
- 80 percent of grey and black water recycled: Water reused and rainwater collected for air-conditioning, toilet flushing or flower watering; only a fifth of wastewater discharged.
- Green environment: Numerous large trees on the water-rich site.
- High-tech double-glazing: Heat drastically reduced and excessive traffic noise eliminated.

The design of the Allianz Tower reflects the principles of “openness, transparency, flow of information and harmonious integration of a modern office building in an environmentally friendly manner”. Allianz wants to serve as a good example for the future development of sustainable high-rise buildings.

Allianz Global Investors’ Triton-Haus

Triton-Haus in Frankfurt’s Westend has been completely revitalized in the past few years in line with the highest ecological standards. The office area measures 28,540m² incl. lobby, storage space of 2,408m² and terrace of 1,200m².

One year after the 10-storey high building went into operation, it was officially certified with DGNB Gold:

- Optimized building shell, sunshade facilities (3-pane heat insulation glazing and external sun protection)
- Highly energy-efficient systems for the supply of energy, combined heat and power station (CHPS) run by biogas, heat output of approx. 200kW. The use of organic gas is another important contribution to CO₂ reduction.
- Ventilation systems and pumps with high electric efficiency. Surface cooling and heating creates a physiologically pleasant room climate through the high cooling and low heating temperatures.
- Innovative concepts for LED lighting with movement sensors both inside and outside are important components of the energy concept. Triton-Haus is one of the first office buildings in Germany that has been equipped with LED lighting not only in the common areas, but also in the offices.
- Sound protection: Airborne and footfall sound protection against exterior noise, third-party working rooms as well as noise insulation against technical plants exceeded by at least 1dB(A).

Tour Allianz One

Athena Tower is a 27-story skyscraper in one of the most prestigious business districts of Europe, La Défense, in Paris. The tower was built in 1984 and was completely refurbished in 2014. The tower provides 35,000m² of leasable office space and 128 parking spaces.

The building includes a restaurant, cafeteria and meeting rooms. The glass volume resembles a crystalline shape. The refurbished Athena Tower will use 40% less energy than a regular office building of its size. It was awarded the HQE, BREEAM, CERTIVEA and LEED GREEN BUILDING certification for environmentally friendly constructions.

- Building management system (BMS);
- Good natural lighting;
- The use of photovoltaic panels;
- Efficient façade system: the southern and western facades were provided with a double skin system and horizontal sun shading louvers for better control of direct sunlight;
- Energy-efficient air-conditioning system, using chilled beams.

28 Source: http://www.thomas-daily.de/en/project/detail/id/d0362e45-3c1f-42d2-9f06-0ceb2d269492/tt/Paris-France/t/Athena-Tower.
Basis for the research were recent publicly available research studies and interviews with selected Real Estate experts. This research was performed in H1 2015.

Please note: the conclusions from the research studies analyzed and summarized in this report do not necessarily reflect AllianzGI's – risklab’s investment opinion. The research does not imply investment advice or investment performance related forecasts.

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