ISCTE Business School
Instituto Universitário de Lisboa

ENVIRONMENTAL BEST PRACTICES OF THE WORLD LARGEST REAL ESTATE COMPANIES AND BENEFITS FOR SHAREHOLDERS

Pedro Vaz

Project submitted as partial requirement for the conferral of
Master of Science in Business Administration

Supervisor:
Prof. Isabel Sofia Santos, Partner of Sustentare – Consultoria em Sustentabilidade

April 2011

Acknowledgments

Because there are some people without whom I would have never been able to complete this thesis, I want to express my gratitude to:

Professor Sofia Santos, for all the knowledge she provided to me during the past nine months and her kindness in supporting me, despite her many other academic and professional commitments.

Professor Ana Lúcia Martins for her willingness to clarify all my initial doubts regarding the concept of a Master's thesis and to Professor Jorge Medeiros for the contribution provided in the financial area.

My father for the unconditional and constant support and motivation showed since the very start of this project in the discussion of all relevant issues and analysis of critical information.

My family and friends for their support and incentive throughout this work.

Abstract

The increasing awareness regarding the main environmental threats resulting from the exhausting use of the available resources has led to the expansion of the concept associated with the sustainable development. Concerning it, there is a wide range of sectors that can contribute for a more efficient exploration and use of resources. One of these sectors is the construction of buildings.

This thesis aims to analyze the environmental best practices implemented by the world's largest eco-friendly real estate companies in the development of green buildings, and to investigate the potential additional financial benefits for their shareholders.

This study begins with the identification of the communication mediums used by the group of companies selected in the disclosure of its environmental performance. Following this, it is studied the best environmental practices applied in the conceptualization, construction and use of buildings in 2006 and 2009 in order to characterize the state of development of the sector and its evolutions in this context. Finally, it is ascertained the existence of higher returns for the shareholders of these companies, by comparing their financial performance with another group deemed unsustainable.

The results achieved demonstrate a positive trend in the adoption of more detailed disclosing methods regarding the sustainability strategy of these organizations. The same trend is verified in the implementation of environmental best practices, which is translated in building ecologically more efficient. However, it cannot be accurately concluded that group of sustainable companies reported financial results more attractive for shareholders.

Keywords: Sustainable development; green buildings; Environmental best practices; Financial benefits.

JEL Classification System: Q01 - Sustainable Development; Q56 - Environment and Development; Environment and Trade; Sustainability; Environmental Accounts and Accounting; Environmental Equity; Population Growth

Resumo

A crescente consciencialização das principais ameaças ambientais decorrentes do uso exaustivo dos recursos disponíveis tem levado à expansão do conceito associado ao desenvolvimento sustentável. Nesta vertente, existem um vasto leque de sectores que podem contribuir para uma exploração e utilização de recursos mais eficiente. Um destes sectores é o da construção de edifícios.

Esta tese destina-se a analisar as melhores práticas ambientais implementadas pelas maiores empresas ecológicas mundiais do sector imobiliário no desenvolvimento de edifícios ecológicos e na investigação de potenciais benefícios financeiros adicionais para os seus accionistas.

O estudo proposto inicia-se com a identificação dos meios de comunicação utilizados pelo grupo de empresas seleccionado na divulgação da sua performance ambiental. Neste seguimento, são estudadas as melhores práticas ambientais aplicadas na conceptualização, construção e utilização de edifícios em 2006 e 2009, de forma a caracterizar o estado de desenvolvimento do sector e a sua evolução neste contexto. Por último, é averiguada a existência de retornos adicionais para os accionistas destas empresas, através da comparação da performance financeira destas com a de um outro grupo considerado não sustentável.

Os resultados apurados evidenciam uma evolução positiva na adopção de métodos de divulgação da estratégia de sustentabilidade destas organizações mais detalhados. A mesma evolução é registada na implementação de práticas ambientais, caracterizando-se na construção de edifícios ecologicamente mais eficientes. No entanto, não pode ser confluir com exactidão que as empresas sustentáveis apresentaram resultados financeiros mais atractivos para os accionistas.

Palavras-chave: Desenvolvimento sustentável; Edifícios ecológicos; Melhores práticas ambientais; Benefícios financeiros

Classificação JEL: Q01 - Sustainable Development; Q56 - Environment and Development; Environment and Trade; Sustainability; Environmental Accounts and Accounting; Environmental Equity; Population Growth

Sumário Executivo

O problema de partida deste trabalho emerge da crescente preocupação com os principais problemas ambientais verificados actualmente. O aumento da temperatura média do planeta no século passado levou ao degelo e consequente subida dos níveis da água do mar, ao aumento das ondas de calor, inundações, tempestades e secas.

Diversas organizações internacionais têm vindo a debruçar-se sobre as melhores práticas a implementar para reduzir os efeitos nocivos causados no ambiente pelas actividades de produção e consumo, ao nível de diversos sectores de actividade. Um dos sectores com maior impacto no cumprimento desta meta é o da construção de edifícios.

Assim, esta tese tem por objectivo estudar a implementação de melhores práticas ambientais por parte das maiores empresas ecológicas no sector imobiliário e averiguar sobre os potenciais retornos financeiros para os seus accionistas.

Com esta finalidade foram colocadas inicialmente quatro questões de investigação para desenvolver este estudo: as maiores empresas ecológicas mundiais do sector imobiliário estão a disponibilizar informação relacionada com as melhores práxicas ambientais que implementam nos seus edifícios? Quais foram essas mesmas melhores práticas implementadas por estas empresas em 2009? Como evoluiu esta tendência quando comparada com 2006? E quais são os benefícios financeiros adicionais para os accionistas que investem neste tipo de empresas?

Após uma revisão de literatura focada nas abordagens relacionadas com o desenvolvimento sustentável, a responsabilidade social das organizações e o desenvolvimento de edifícios ambientalmente sustentáveis, os ditos ecológicos, estabelecem-se os seguintes objectivos para esta tese: descobrir o tipo de meios de comunicação empregues na divulgação da performance ambiental das empresas analisadas; perceber quais as principais medidas implementadas e com que principais categorias ambientais é que estas se relacionam; averiguar a evolução na implementação destas melhores práticas face a 2006; e apurar se existem retornos financeiros superiores para os accionistas pelo investimento nas empresas mais sustentáveis do sector imobiliário, em detrimento a outras com menor enfoque nesta temática.

Seguindo uma metodologia que identifica um conjunto de 43 empresas alvo deste estudo, foram seleccionadas todas aquelas que marcaram presença nos índices de sustentabilidade Dow Jones Sustainabity Index e FTSEE4GOOD em 2010.

Na resposta às questões colocadas foram analisadas diversas fontes de informação relacionadas com as temáticas em estudo. Foram consultados os diferentes meios de disponibilização de informação relacionada com a responsabilidade ambiental através dos endereços *on-line* dos constituintes da amostra. Para efectuar o estudo das melhores práticas ambientais implementadas neste sector, foi seleccionada uma amostra de 10 empresas do grupo anterior, para as quais foram analisados os relatórios de sustentabilidade dos anos de 2006 e 2009. E por último, foram analisados os principais indicadores financeiros de medição de retorno sobre o capital investido, como forma de identificar potenciais benefícios para os accionistas.

Do confronto da revisão de literatura com a análise efectuada às quatro hipóteses de investigação, surgem os principais resultados obtidos:

- Ainda que o número de empresas do sector imobiliário a disponibilizar relatórios de sustentabilidade tenha aumentado entre 2006 e 2009, metade da amostra considerada ainda emprega pouco esforço nesta actividade;
- A maioria das empresas analisadas apresentava, em 2009, medidas concretas e mensuráveis na demanda pelo desenvolvimento de edifícios mais ecológicos, principalmente aos níveis da eficiência energética, utilização de recursos e materiais e poupança de água;
- É claro o crescimento desta tendência na amostra analisada, sendo que em 2006, a maioria das práticas ambientais ainda estavam num ponto mais embrionário, centrando-se principalmente em disponibilizar informação de carácter mais qualitativo, visando um enfoque maioritariamente comercial; e
- Por fim, não é possível concluir que as empresas ambientalmente mais sustentáveis apresentem melhores resultados financeiros para os accionistas, visto tal apenas se verificar em parte dos indicadores analisados e não na sua totalidade.

Index

Tables Index

Figures Index

CHAPTER 1 – INTRODUCTION

1.1 CONTEXT AND MOTIVATION

Climate change has become a major global issue. The average temperature has increased in the twentieth century leading to sea level rise, increasing frequency of heat waves, storms floods and droughts. According to the Intergovernmental Panel on Climate Change, the expected increase in temperature for the current century will accentuate these issues even further.

One of the main factors contributing to the environmental degradation is the consumption of energy in buildings usage and development. In fact in 2007 European commercial and residential buildings final energy consumption accounted for 35.8% of the total consumption and 39.2% in the USA.

Environmental issues were raised in the late 70's and along with that new solutions have been developed to address them from different perspectives. One of them is green building.

Green building refers to a way of constructing buildings without making the mistakes earlier generations committed since they did not fully realize the effects their actions had on the environment. The Directorate of General Environment of the European Commission identified the construction work as one of the industries that represents a highest green potential. Additionally, the European Union Sustainable Development Strategy disclosed in 2010, which deals in an integrated way with economic, environmental and social issues, listed climate change and clean energy as one of the key challenges to address in the next five years.

1.2 RESEARCH QUESTIONS

The purpose of this thesis is to analyze the environmental best practices of the world largest real estate companies and its benefits for shareholders. Thus, the research question that will guide this study is the following:

> *Are the world's largest real estate companies implementing environmentally best practices in order to address the main global environmental issues of today and does it result in higher returns for the shareholders who invested in those companies?*

In order to answer this question, four testing hypotheses were defined as the main drivers to lead this investigation:

Are the world largest real estate companies disclosing information regarding the environmental best practices implemented in their buildings? Which were the environmental best practices implemented by these companies in 2009? How did it evolved since 2006? And what are the financial benefits for stakeholders investing in eco-friendly real estate companies?

These questions will be answered based in study conducted on a sample constituted by 43 real estate companies listed in Dow Jones Sustainability Index and FOOTSIE4GOOD.

The first hypothesis required an analysis conducted on the communication mediums used by these companies to disclose corporate social responsibility data. In the second hypothesis, it were identified all the best practices presented in 2009 Corporate Social Responsibility reports of the 10 largest companies of the previous sample. In the third hypothesis it was performed the same study for the same companies but for the 2006 Corporate Social Responsibility. The last hypothesis involved the study of financial indicators responsible to measure rates of return to shareholders.

1.3 STRUCTURE

This thesis is divided in four chapters: literature review, methodology, findings analysis and conclusions.

The first chapter consists in the literature review that serves as the basis for this study. Firstly it covers the topics regarding the concepts of sustainable development and corporate social responsibility. Then it presents the main environmental issues behind the rise of these concepts and for last it describes the notions related with green building as well as studies conducted on this field.

The second chapter consists in the methodology followed in this thesis. It presents the testing hypothesis that will be analyzed in this study and explains the method used in the research performed. For each one of the four hypotheses defined, it details its purpose, sample selected and the data collection process.

The third chapter consists in the findings analysis. This is the main chapter of this thesis where the results achieved through the analysis of each one of the four testing hypotheses are presented, following to the proposed methodology. The analysis conducted in this chapter leads to the ultimate purpose of acceptance or rejection of these hypotheses.

The fourth and last chapter consists in the presentation of the conclusions drawn in this thesis. Additionally it also identifies the limitations to the results achieved in this study and identifies some tips for future research on this subject.

CHAPTER 2 – LITERATURE REVIEW

This chapter reviews the sustainable development concept and its dissemination around the world through global organizations. It then integrates it in a broader theory regarding corporate social responsibility (CSR), and the society expectations towards today's companies and their businesses, highlighting different management approaches. Finally the scope is narrowed to the analysis of the current environmental issues that have been triggering real estate operators to develop sustainable buildings in compliance with new ecological living standards. This last subchapter identifies how to build and measure green homes efficiency, according to the most important rating systems available and the fundamental key aspects behind them.

2.1 SUSTAINABLE DEVELOPMENT

Sustainable development was first defined as the one that "*meets the needs of the present without compromising the ability of future generations to meet their own needs*" (Bruntland, G, 1987: 43). Later on it was broadly spread as a concept integrating three dimensions: economic, social and environmental, as a way to assure a quality of life possible of being preserved for many generations. According to Crabbe (1997) that can be achieved since sustainable development focus on economic viability (long term benefits superior to initial investment costs), social desirability (fulfilling people cultural and material needs) and ecological sustainability (balancing the exploitation of renewable and non renewable resources and maintaining the eco-systems alive) in the way businesses should me managed.

2.1.1 Economic theories

In order to discuss the arising of global consciousness regarding environmental issues as well as their impacts on companies and communities, it is crucial to first take a brief look into the economic theories behind it.

- **Neoclassical economies**

According to the neoclassical economies' theory, only labor and capital were factors to be taken into account in production equations since they were the ones responsible for economic growth. When questioned about the environmental impact caused by this cowboy economy – mentioned

by Boulding (1966) as an economy of the past, with a reckless, exploitative and violent behavior, which is characteristic of open societies – Robert Solow (1992) stated that the environment was not important once when some resources became scarce, the market would find a new equilibrium to replace them. These resources price would increase due to a supply decrease and thus cause a change in production and consumption behaviors (so scarce resources would automatically regenerate bringing environmental stability back to normal).

- **Ecological economies**

However, unlike neoclassical economists predicted, although some finite natural resources where reaching its end, no renewable or recycled substitutes were being developed to conveniently replace them. Companies and consumers were not taking rational decisions, and even though there was no doubt about the existence of scarce resources, prices were not being adequately adjusted (Kohn, 1998).

Therefore, contradictory to Solow (1992) view was Herman Daly's (1977). This economist defended that the economic growth should be limited by the ecosystem, given that the higher the income, the greater the environmental degradation would be. Thus the environmental impact should be taken into account in economic analysis as well.

Also known as the spaceman economy (in opposition to the cowboy one, stating that man must find his own place in the ecological system allowing it to be capable of continuous reproduction), this theory has been gaining importance due to the lack of response from the neoclassical economies to meet the new society expectations regarding environment potential hazards. According to Daly, resources are indeed necessary for production, but the amount required can be as little as one likes.

2.1.2 Rising global awareness

Along with the growth of the ecological economies theory, since the early 1970s several international initiatives to encourage a change in behaviors towards sustainable production and consumption have been taking place. Some of the most important ones are listed below:

- **OCDE**

In 1971 OCDE founded its Environment Policy Committee (EPOC) for "*countries to share their experiences and to develop recommendations for the development and implementation of policies*

that can address environmental problems in an effective and economically efficient way"[1]. Currently the main issues EPOC is focused on are: water, climate change, resource efficiency, biodiversity, safety of chemicals and nonmaterials, eco-innovation and green growth.

- **Limits to Growth**

Published in 1972 by the Club of Rome, this was the first report clearly emphasizing the impacts and consequences of the pollution in the environment, caused by an aggressive economic growth. It mentioned that if population growth, industrialization, food production and consumption on nonrenewable resources did not suffer a radical change, the limits to growth of our planet would be reached in the next 100 years (Meadows, Meadows, Randers and Behrens III,1972).

- **United Nations Environmental Program (UENP)**

Established in 1972, the UNEP is responsible for the coordination of the environmental initiatives of the United Nations. Its mission is "*to care for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations*"[2]. The UNEP is also responsible for the creation of the UNEP Financial Initiative (which cooperates with banks, insurers and fund managers), to "*understand the impacts of environmental and social considerations on financial performance*"[3].

- **European Commission's Environment Directorate-General**

The role of this Directorate of the European Commission founded in 1973 is to "*initiate and define new environmental legislation and to ensure that agreed measures are put into practice in the EU Member States*"[4]. Its main challenges to address in 2010 were settled in the Sixth Environment Action Plan (2010) in seven thematic strategies: air, marine, waste, urban, natural resources, pesticides and soil. Furthermore, in the Action on Climate Change Post 2012 (2004), the European Commission elected the climate change as its main issue to address in the future.

- **The Brundtland Report**

This report was launched by the World Commission on Environment and Development in 1987 pointing out the causes of the environmental problems and presenting solutions. According to it, the problems were caused by the poverty of the South and the abusive production and

[1] OCDE (04.10.2010), http://www.oecd.org/about/0,3347,en_2649_33713_1_1_1_1_1,00.html
[2] UNEP (04.10.2010), http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=43
[3] UNEP Financial Initiative (04.10.2010), http://www.unepfi.org/
[4] EC Environment 04.10.2010), http://ec.europa.eu/environment/who_is_who_en.htm

consumption of the North. Political willingness, change in consumption patterns, public participation and use of technology were referred as critical factors to change these trends (Hauff, 2007).

- **Kyoto Protocol**

The Kyoto protocol is an international agreement included in the United Nations Framework Convention on Climate Change, which aims to reduce the emission of greenhouse gases by 5.2% (comparing with the emissions in 1990) between 2008 and 2012[5]. The main actions to implement in order to achieve this goal are the following: restructure the energy and transport industries, promote the use of renewable energies, change some financial markets' mechanisms and protect forests. This protocol was adopted in 1997 and currently counts with 187 country members.

Since their foundation, all these organizations have been pressuring markets and larger companies to adopt better practices regarding their social and environmental impacts, which triggered the development of corporate social responsibility in order to plan, execute and control those initiatives.

2.2 CORPORATE SOCIAL RESPONSIBILITY

The World Business Council for Sustainable Development (WBCSD, 2002: 2) defines CSR as "*the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families, as well as of the local community and society at large*". However there is not a generally common definition for CSR and in order to complement the previous one, the European Union additionally mentions that it is a "*concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.*"[6]

The acknowledgment of this idea has been driving firms to become responsible for the integration of the sustainable development concept into their businesses.

Hence, this subchapter reviews the origins of CSR and clarifies the main reasons for companies to be recently paying more attention to sustainability. It then bridges CSR with the different

[5] UNFCCC (04.10.2010), http://unfccc.int/kyoto_protocol/items/2830.php

[6] European Commission (09.10.2010), http://ec.europa.eu/enterprise/policies/sustainable-business/corporate-social-responsibility/index_en.htm

management approaches and presents the most important measures that organizations have been using to implement and communicate their sustainability strategy and policies.

2.2.1 Origins of CSR

In the 1960's large companies started to be questioned about their labor practices and the environmental impacts of their activities. This decade was defined by Hopkins (2004) as a period of enlightenment. In the 1970's the stakeholder theory was first addressed and it firmly marked the beginning of the integration of other interested parts that not only capital holders on management concerns (Freeman, 1984). Finally in the 1990's the pressure from the society seeking to see large corporations worried with business ethics and the impacts of their core activities outside their business sphere led to the growth of corporate social responsibility notion (Tuzzolino and Armandi, 1981).

2.2.2 Society expectations

According to the OCDE Directorate for Financial, Fiscal and Enterprise Affairs' Guidelines and Other Corporate Responsibility Instruments (2008), the main issues regarding CSR are: accountability, business conduct, community involvement, consumers and marketplace, corporate governance, employees and workplace, environment and human rights. In order to achieve these goals, companies must focus on a higher involvement with its stakeholders to better understand their needs and expectations towards these issues.

The legitimacy theory explains the reasons that are driving companies to pursuit solutions for the challenges mentioned above, which can be beneficial for stakeholders and themselves. Aiming to achieve this objective, it is necessary to implement a solid stakeholder dialogue strategy to increase common efforts and enhance communication between both ends.

- **Legitimacy theory and license to operate**

According to Grey, et al (1996) the success of an organization depends on its acceptance by the society and subsequently capability of operating according to the existing set of values and beliefs. Thus they are expected to implement actions that meet the social expectations in order to legitimize their activity.

With the purpose of ensuring a better relationship and acceptance by stakeholders, organizations are seeking to preserve their legitimacy throughout time. Consumers are now becoming more

aware about environmental hazards and the need to preserve our ecosystem, and hence willing to move towards green products. But merely if it does not change their lifestyle, which emphasizes the difficulty in changing consumption patterns (Yates, 2008). Nonetheless, according to a survey conducted by the Opinion Research Corporation in the US in 2009, even during the recession in 2009 (when people could expect to be less sensitive to these aspects) consumers were demanding more attention by organizations to environmental issues. However this is also a huge challenge, since companies are still researching on how to build products, which are both environmental sustainable and profitable.

- **Stakeholder dialogue**

As referred above, society demands are requiring an increased engagement between organizations and its stakeholders. Thus, companies are developing stakeholder dialogue efforts in order to "*engage people in serious discussion, and a designed and facilitated process for groups to initiate dialogue with those persons and institutions that have a stake in their activities*" (World Business Council for Sustainable Development, 2001: 2). Along with that, companies are developing stakeholder panels, which "*serve as a link to gather information and as an avenue for better understanding of the business impact on stakeholders*" (United Nations Global Compact, 2010: 3) regarding CSR current issues.

- **Triple Bottom Line**

The integration of a fully integrated sustainability strategy in an organization that takes into account the achievement of economic, social and environmental development is directly connected with the triple bottom line concept. According to Norman and MacDonald (2003: 1), the idea behind it is that "*a corporation's ultimate success or health can and should be measured not just by the traditional financial bottom line, but also by its social/ethical and environmental performance*".

Hence the pressure from customers, suppliers, employers, local communities and subsequently from the financial markets for companies to present their results in social and environmental terms as well is expected to grow in the near future, following the growing importance these groups have reached inside organizations.

2.2.3 Shareholder versus stakeholder approach

The growth of the importance and general awareness of the society in the companies' businesses has lead since the beginning of the millennium to a gradual switch from a shareholders centered management to an integrated stakeholders' one (Cartwright and Craig, 2006). In fact some economists have acknowledge that other factors rather than labor and capital should be included in economic evaluations and some companies started to make efforts to meet the expectations of other stakeholders, that not only shareholders.

The shareholder approach, arguing that the board of directors should manage their company in the best interests of its owners (the shareholders) to increase the share price, company value and dividend payments was challenged by the stakeholder theory.

Opposite to the objective of just meeting the objectives of shareholders, the stakeholder theory pretends to achieve a balance between economic and social goals. In order to accomplish that it would be necessary to recognize the interests of other individuals, companies and the society at large (Health and Norman, 2004).

Therefore, intending to balance the needs and expectations of the stakeholders and shareholders, the enlightened shareholder approach was developed (Lantos, 2001). According to this approach, managers should pursue the interests of its shareholders, but in an enlightened way, which involves looking in the long term and build sustainable relationships with all stakeholders. The same author says that this would not mean a reduction in profits, but exactly the opposite, since it contributes to a favorable public opinion, increasing brand image and enhancing employee's morale leading them to a higher levels of productivity.

2.2.4 Addressing stakeholders' issues and expectations

In order to assure to stakeholders that companies are measuring the social and environmental impacts of their developments a set of rules and standards have been developed in the last decade.

- **International Business Standards**

In order to comply with stakeholders' needs regarding companies' activities, three important standards were developed by International Organization for Standardization (ISO) and AccountAbility. They seek to empower a "*consensus to be reached on solutions that meet both*

the requirements of business and the broader needs of society"[7] certifying companies for high performance in addressing CSR current issues. Next, are pointed out three important international norms related with environmental and social concerns to be complied:

- AA1000 – "*Involve stakeholders in identifying, understanding and responding to sustainability issues and concerns, and to report, explain and be answerable to stakeholders for decisions, actions and performance*" (AA1000 Accountability Principles Standards, 2008: 6);
- ISO 14001 – Environmental management – identify and control environmental impact of activities, products and services and improve environmental performance (Environmental management – the ISO 14000 Family of International Standards, 2009); and
- ISO 26000 – Social responsibility – Clarify and provide guidance on social responsibility issues to address as well as identify a set of best practices for companies to follow to (ISO 26000 Project Overview, 2010).

- **Reporting**

Since keeping solid relations with stakeholders is a critical aspect for organizations, it is important to understand how to incorporate it in an effective communication strategy.

In order to provide companies with guidance about the best way to disclose information regarding CSR challenges and stakeholder demands, two important initiatives were developed: United Nations Global Compact (UNGC) and Global Reporting Initiative (GRI).

While UN Global Compact (Corporate Citizenship in the world Economy, 2008: 2) is a "*policy platform and a practical framework to align business operations and strategies everywhere with universally accepted principles in the areas of human rights, labor, environment and anti-corruption*", GRI intends to "*serve as a generally accepted framework for reporting on an organization's economic, environmental, and social performance*" (GRI Reporting Guidelines, 2007: 3). In 2008, UN Global Compact counted with 4,619 business participants and GRI with over 1,000, being the majority of them large companies.

[7] ISO (24.10.2010): http://www.iso.org/iso/about/discover-iso_isos-name.htm

- **Sustainability Indexes**

Sustainable indexes were developed along with the growth of stakeholder's importance within organizations and their stronger demands for a sustainable growth. Thus, aiming to measure the financial performance of the world leading sustainable companies, the United States launched in 1999 the Dow Jones Sustainability Index (DJSI), followed by the United Kingdom's FTSE4GOOD in 2001. These indexes can be used as a tool to identify the most responsible companies and hence to do responsible investments and to research and benchmark on CSR best practices regarding multiple different sectors[8].

In the developments above stated one can see that the environmental factors have been included in the several management approaches, frameworks and indexes created to implement CSR amongst companies. The next section elaborates on the environmental issues and its main implications for this thesis.

2.3 ENVIRONMENTAL ISSUES

This thesis approached the raise of the sustainability concept. From this point on and according to the theme of this work, the scope will be narrowed to the study of environmental sustainability in the real estate state sector, through the development of eco-friendly homes. Nevertheless it is first important to understand the environmental main concerns driving real estate operators to change the structural architecture of their buildings.

Consequently, this subchapter highlights the most critical current environmental issues affecting modern society and the proposed/implemented measures to solve them according to the Global Environment Outlook published by the UNEP in 2007. The issues to be addressed next are: climate change, land and water.

2.3.1 Climate Change

Climate change has become a major global issue. The average temperature has increased 0.74ºC in the twentieth century leading to sea level rise, increasing frequency and intensity of heat waves, storms floods and droughts. According to the IPCC, the expected increase in temperature for the current century will be between 1.8 and 4°C, accentuating these issues even further. Once

[8] FTSE4GOOD (27.10.2010), http://www.ftse.com/Indices/FTSE4Good_Index_Series/index.jsp

greenhouse gas emissions (mainly CO_2) is the main driver of this change, the procedures to be adopted in order reverse this situation focus on its reduction:

Table 1 – Measures adopted to reverse climate change

Category	Measures
Regulatory measures	Development of energy and appliance efficiency portfolio standards
	Raw materials improvements through industrial standards, R&D and demonstration
	fuel switching through R&D and demonstration
Economic measures	Taxation policies , like carbon taxes, pollution tax, fuel taxes or public benefit funds
	Subsidy policies for promotion of renewable energy sources
Technological measures	New technology penetration via technology standards, technology transfer and R&D
	Carbon sequestration by issuing of emission taxes

Source: UNEP - Global Environment Outlook (2007)

2.3.2 Land

Currently more than half population in the world lives in cities, which have been growing rapidly over the last two decades, especially in developing countries. As a result harmful and persistent pollutants, like heavy metals, organic, agrochemicals and obsolete chemicals are released to the land from mining, manufacturing, transporting and sewage. The table below highlights the most important measures being adopted to reverse this issue:

Table 2 – Measures adopted to decrease land pollution

Category	Measures
Regulatory measures	Integration of precautionary approach developing regulators to industries
	Development of adequate chemicals management infrastructures in every country
Technological measures	Use of less-hazardous materials and adoption of best available technologies and environmental practices
	Encouragement of innovation in manufacturing, non-polluter alternatives in construction and agriculture and waste avoidance and minimization

Source: UNEP - Global Environment Outlook (2007)

2.3.3 Water

Intensive use of water resources is leading to a decrease in freshwater availability, which along with the conservation of aquatic resources are key to human well-being. If water consumption patterns maintain the same, it is expected that in 2025 1.8 billion people will be leaving in regions with absolute water scarcity. Thus, important measures and procedures have been being implemented intending to balance environmental and developmental needs regarding water resources and aquatic ecosystems utilization as expressed in Table 3:

Table 3 – Measures adopted to preserve water

Category	Measures
Regulatory measures	Licensing supply sources and withdrawals and defining protected areas
	Enforceable water quality standards
Technological measures	Rainwater harvesting
	Water treatment and re-use technologies
	More efficient irrigation techniques

Source: UNEP - Global Environment Outlook (2007)

2.3.4 The role of the real estate sector

The issues raised above are also connected with the real estate sector as well as the proposed measures to reverse their consequences are also applicable to it.

"The UNEP estimates that *"the environmental footprint of the building sector includes: 40% of energy use, 30% raw materials use, 25% of solid waste, 25% water use and 12% of land use*" (Common Carbon Metric, 2010 – UNEP-SBCI: 3).

Nevertheless, according to the Intergovernmental Panel on Climate Change (IPCC), through the available technologies in the market, the real estate and construction sectors alone have the potential to reduce its greenhouse gas emissions in 30 to 50% without significant higher investments. This can be achieved by having buildings with more intelligent design, better insulation, use of efficient household appliances and HVAC (heating, ventilating and air conditioning) systems and an adequate behavior from households (Econews, September 2010). The next subchapter addresses these issues by clarifying the whole concept of sustainable buildings.

2.4 SUSTAINABLE BUILDINGS

The U.S. national program Whole Building Design Guide defines a sustainable building as the one that "*supports an increased commitment to environmental stewardship and conservation, and results in an optimal balance of cost, environmental, societal, and human benefits while meeting the mission and function of the intended facility or infrastructure*"[9]. Maczulak (2010) details this concept by adding that the green building development process in divided in six main areas: energy use, land and water use, materials employed, construction methods, integration with the community, and indoor environmental quality.

This subchapter deepens into the full comprehension of this concept and its ramifications. It outlines the reasons that led to the development of these new types of buildings and the main international rating systems to assess their efficiency levels: Finally it also covers the six key aspects behind the development of a sustainable building.

2.4.1 Motivation behind sustainable building

According to the White Paper on Sustainability (2003) until the 70's no one would take into account the need to be sustainable. No one would speak in terms of sustainable buildings. However, as it was analyzed in the first two subchapters, this fact has been changing rapidly with consumers becoming more aware and demanding towards companies' actions to minimize their impact on the environment.

According to Bauher, Mosle and Shwarz (2007) in average a person leaving in an industrial nation spends about 85% of its lifetime indoors. In 2007 the European commercial and residential final energy consumption accounted for 35.8[10] of the total consumption and in USA this value goes up to 39.2%[11]. Furthermore "*buildings contribute to nearly 40% of global warming emissions, so increasing energy efficiency of our homes and businesses is an urgent clean energy solution to global warming and rebuilding our economy*" (United States Green Building Council, 2010: 2).

As a consequence of this numbers, the project Vision 2050 launched by the WBCSD in 2010, outlines the importance of buildings to have zero emissions, which implies the existing buildings

[9] WBDG (07.11.2010), http://www.wbdg.org/design/sustainable.php

[10] European Energy Agency (07.11.2010): http://www.eea.europa.eu/data-and-maps/indicators/final-energy-consumption-by-sector-1/final-energy-consumption-by-sector-5#toc-0

[11] U.S. Energy Information Administration (2010), Energy Consumption by Sector

to be readjusted and new ones to take this principle into account. To achieve this objective, aggressive policies involving fiscal benefits, incentives and subsidies, stricter regulation and certification will be taken into place (Lopes, 2010). Along with society expectations towards a greener and smarter consumption, these facts have also been pressuring real estate developers into the development of eco-friendly buildings and several rating systems have been consequently developed.

2.4.2 Rating systems for sustainable buildings

A building can be defined as sustainable one thought the combination of all of its sustainable features and attributes (that is, if it composed by materials and features that consume fewer resources in its production and transportation and contribute to lower consumption levels of energy, water and waste and to a better life quality from its occupants), which can be evaluated thought rating systems (Green Building Finance Consortium, 2010). However, like the United Nations Framework on Conservation and Climate Change states in its report Greenhouse gases, sectors and source categories under the Kyoto Protocol (2008), once the environmental impacts caused by the real estate sector are considered to be indirect (buildings are not the direct producers of the materials and energy they consume, as they acquire it from other suppliers) there are no international agreements regulating its activity (like for instance Kyoto does for the energy or some industrial sectors).

Therefore, in order to bridge this gap building's rating systems have been developed *"to measure the sustainability level of Green Buildings and provide best-practice experience in their highest certification level*" (Bauher *et all*, 2007). According to well-clarified checklists and guidelines, real estate companies have the opportunity to voluntary assess the environmental performance of their buildings and compare it with the best practices available. Some of the most important rating systems for sustainable buildings are LEED (USA), BREAM (United Kingdom), HQE (France), DGNB (Germany), Green Star (Australia), Green Globes (Canada) and CASBEE (Japan). According to Research (2009), the most common used ones are BREAM and LEED.

- **BREAM**

The objective of BREEAM (BRE Environmental Assessment Method) is to *"set the standard for best practice in sustainable design and become the measure used to describe a building's*

environmental performance"[12]. This assessment method created in 1990 in the United Kingdom is divided in many versions focused on the following different type of buildings: courts, eco-homes, education, industrial, healthcare, multi-residential, offices, prisons and retail. BREAM Multi-residential 2008 Assessor Manual identifies the key aspects that it evaluates as: energy (19%), health and well being (15%), material (12.5%), management (12%), pollution (10%), land consumption (10%), transport (8%), waste (7.5%) and water (6%).

- **LEED**

Developed in 1998 in the USA, LEED is an "*internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most*"[13]. This assessment method is targeted to measure the performance of the following types of buildings: new construction, existing buildings, commercial interiors, core and shell, homes, schools and retail spaces. The metrics it evaluates are: energy and atmosphere (25%), indoor environment quality (22%), sustainable sites (20%), materials and resources (19%), water efficiency (7%) and innovation in design (7%).

- **BREAM versus LEED**

The question that may rise after presenting both systems is which one is the best to use after all. According to the Sustain Magazine (June 2009) buildings must be assessed attending to rating systems developed in their countries (unless deemed particularly inefficient) since they reflect the local environmental issues to address. However when no local system is available, the best option is to chose between either BREAM or LEED according to the higher relevance each one of them confer to the most important aspects to be found in a sustainable building in that certain place.

Beyond the contribution to a more sustainable society and the improvement in the stakeholders' expectations as a result from it, certified buildings are also connected with financial benefits. Regarding LEED's certified properties, according to a study of McGraw-Hill Construction, they have 3.5% higher occupancy rates, 3% higher renting fees and 7.5% higher estimated value than traditional buildings, thus resulting in an increase in the return on investment of 6.6% (Research, 2009).

[12] BREAM (26.11.2010), http://www.breeam.org/page.jsp?id=66
[13] LEED (27.11.2010), http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988

2.4.3 Key aspects in the sustainable building concept

According to Ashley Katz, head of Communication of United States Green Building Council (USGBC), if it can be built a high performance structure that besides saving money is also better for its occupants and the environment, of course that it makes sense to do it (Research – Sustentare, 2009). Sustainable buildings must be raised thinking more in the future than in the present in order to provide high quality, security, and durability and be eco-friendly and healthier. The UNEP estimates that 80 to 90% of the energy used by a building is consumed during its life-cycle (for heating, cooling, ventilation, lighting, appliances, and so on) and the other 10 to 20% is consumed during extraction and processing of raw materials, manufacturing of products, construction and demolition (Common Carbon Metric, 2010 – UNEP-SBCI). Therefore, a green building plan has to start by conforming to what environmentalists call the three R's: reduce, reuse and recycle.

To achieve these objectives it is presented bellow a brief explanation of the main sustainable features these buildings must comply with, divided according to the six categories proposed by LEED. It was specifically chosen this rating system to classify buildings sustainable features, once according to the Green Building Finance Consortium it is one of the world's leading and most developed green buildings' rating systems. The six categories are: energy and atmosphere, indoor environment quality, sustainable sites, materials and resources, water efficiency and innovation in design. LEED Registered Project Checklist for Constructions released in 2008 includes in these categories the following most important aspects:

- **Energy and atmosphere**
  - Optimized energy performance;
  - Refrigerant management;
  - On-site renewable energy;
  - Use of green power;
  - Commissioning of the building energy systems; and
  - Measurement and verification of energy consumption.

- **Indoor environmental quality**
  - Environmental tobacco smoke control;
  - Outdoor air delivery monitoring;

- Increased ventilation;
- Low-emitting materials;
- Indoor chemical and pollutant source control;
- Thermal comfort and lighting controllability; and
- Daylight and outside views.

- **Sustainable sites**
  - Construction activity pollution prevention;
  - Development density and community connectivity;
  - Brownfield redevelopment;
  - Existence of alternative transportation methods;
  - Protection and restoration of habitats;
  - Stormwater design; and
  - Light pollution reduction.

- **Material and resources**
  - Storage and collection of recyclables;
  - Materials reuse and recycled content;;
  - Construction waste management;
  - Regional materials;
  - Rapidly renewable materials; and
  - Use of certified wood.

- **Water efficiency**
  - No potable water use;
  - No irrigation;
  - Innovation water saving technologies; and
  - Water use reduction.

- **Innovation in design**
  - Innovation in design; and
  - Accredited professionals on sustainable buildings.

Finally, in 2010 the Green Building Finance Consortium conducted an investment analysis (Value Beyond Costs Savings) in energy efficient buildings to estimate the increase value in the initial cost associated with the different levels of LEED certification. They concluded that:

- The lowest certification level is associated with a 0.8% higher initial cost;
- The medium certification level (Silver) involves 3.5% more initial costs;
- The highest certification level (Gold) means a 4,5% higher initial cost; and
- The top certification level (Platinum) may imply 11.6% more costs.

2.4.4 Sustainable building trends and challenges

According to Maczulak (2009: 130), the main trends and challenges to be solved regarding sustainable buildings are the ones presented below:

Table 4 – Sustainable building trends and challenges to be addressed

Actions accepted or becoming accepted	
Description	**Category**
▪ Long-life fluorescent lightning; ▪ Effective insulation; and ▪ Solar energy;	Energy efficiency
▪ Recycled construction materials, salvaged fixtures, metals, and countertops; and ▪ Waste reduction.	Material and resources
Continuing problems that need a solution	
Description	**Category**
▪ Electricity from fossil fuel from powered power plants; ▪ Electricity waste; and ▪ Always-on electronics.	Energy efficiency
▪ Oversized houses.	Site ecology
▪ Water waste.	Water efficiency

Source: Maczulak (2009: 130)

2.5 BRIEF SUMMARY AND NEXT STEPS

This chapter reviewed the literature to understand the research that it is subsequently done in this thesis. Since its purpose is to analyze the environmental best practices of the world largest real estate companies and its benefits for shareholders, it was first defined the global concept embracing this subject – the sustainable development. Then the scope was narrowed to the analysis of the integration of this concept in companies' activities through their CSR strategy. The main environmental issues pressuring a change in the real estate sector were referred next, highlighting the need for buildings to be eco-friendly, which led to the last part of this chapter where sustainable buildings were described.

The next chapter presents the four investigation hypotheses of this thesis and the method used on the research performed in order to answer the research question raised by this thesis: are the world's largest real estate companies implementing environmentally best practices in order to address the main global environmental issues of today and does it result in higher returns for the shareholders who invested in those companies?

CHAPTER 3 – METHODOLOGY

This thesis involves the study of the environmental best practices being adopted by the world largest sustainable real estate companies in their residential and commercial buildings and the analysis of its potential benefits for shareholders.

Thus in order to meet up with these objectives, the present chapter exposes four testing hypotheses and details the method used to investigate each one of them and draw conclusions on its occurrence and veracity. The questions raised by these hypotheses are the following ones: Are the world largest real estate companies disclosing information regarding the environmental best practices implemented in their buildings? Which were the environmental best practices implemented by these companies in 2009? How did it evolved since 2006? And what are the financial benefits for stakeholders investing in eco-friendly real estate companies?

3.1 INVESTIGATION HYPOTHESES

Before presenting the hypothesis to be analyzed in this thesis it is important to clarify that they are divided in two parts, which reflects the two major subjects of the study to be performed:

1. The analysis of the environmental best practices being adopted by the world largest real estate companies is conducted in the first three hypothesis; and
2. The study of the benefits for the shareholders of these companies resulting from the adoption of these practices is made in the fourth hypothesis.

Next the four hypotheses are presented and explained.

- *(Hypothesis 1): Real estate companies listed in sustainability indexes are disclosing information regarding the environmental practices they are implementing in their buildings through corporate sustainability reports.*

In order to start the research on the environmental best practices being adopted by real estate companies it is primary important to gather detailed and specific information on the implemented measures and procedures on this subject.

The purpose of this hypothesis is to identify the level of detail used in the information disclosed in order to conclude on the effort dedicated to the communication of the environmental performance. Furthermore it also shapes the sample to be tested in the next hypothesis since a deepen study can only be made in companies providing detailed information.

- *(Hypothesis 2): Real estate companies implemented environmentally sustainable practices in their buildings in 2009 related with energy and atmosphere, indoor environmental quality, sustainable sites, material and resources, water efficiency, and innovation in design.*

As it is mentioned in the literature review, sustainability as a business concern has been growing mainly in the last two decades. In September 2010 in a worldwide study conducted by the United Nations for a horizon of 2050, sustainability was considered by 93% of the enquired CEOs (in a total of 1000) as a determinant factor for the future and success of their companies.
According to the relevance that has been given to sustainability throughout the world recently, this hypothesis intends to analyze, for the case of the real estate sector, which are the specific measures and procedures (characterized as best practices) that were adopted in the fiscal year of 2009, in terms of: energy efficiency, site ecology, water efficiency, material and resources, indoor air quality and innovation in design, which are the topics analyzed by LEED system explained in the previous chapter. This will allow us to conclude about the effort put through environmental sustainability by some of the largest real estate companies and analyze the actions implemented according to those six key aspects.

- *(Hypothesis 3): Real estate companies have been increasingly adopting environmentally sustainable best practices in their buildings regarding energy and atmosphere, indoor environmental quality, sustainable sites, material and resources, water efficiency, and innovation in design between 2006 and 2009.*

The purpose of the previous question is to analyze the level of environmental best practices adopted in 2009. However study the situation solely in that year will only lead to conclusions regarding the current state of things and nothing on its evolution.

Thus in order to ascertain about the development of environmental sustainability best practices in the real estate sector, it is conducted the same study done in the last hypothesis to the exact same companies but for the fiscal year of 2006. The comparison of both results will help to understand the evolution of the relevance that environmental sustainability (characterized by the six key aspects mentioned in the hypothesis description) has been having inside these companies, although the period considered is characterized by the subprime and subsequent financial crisis since 2007[14].

- *(Hypothesis 4): Real estate companies listed in sustainability indexes have been presenting better financial results than the non listed ones.*

After identifying the mechanisms used by companies to communicate their actions towards sustainability, analyzing the best practices being adopted in 2009 and characterizing its evolution since 2006, this hypothesis focuses on understanding the financial benefits for shareholders.
Companies are held by shareholders and they are the entities responsible for investing in businesses development and the ones who support the major risks inherent to this activity. Therefore as an important stakeholder, the capital holders expect firms to generate profits so they can collect dividends as a reward from their investments.
The objective of this hypothesis is to verify if the world largest real estate firms adopting environmental sustainability best practices generate higher financial results than the not listed ones, and hence are more attractive to shareholders.

3.2 METHOD USED

Following the testing hypotheses mentioned above, this subchapter describes the method used to conduct its research and analysis.
According to Burney (2008), there are two types of research methods known as the deductive and the inductive ones.
The deductive method (also called waterfall) bases its study from the more general to the more specific. That means that it first starts with the analysis of a general theory through the

[14] BBC News (14.09.2010), http://news.bbc.co.uk/2/hi/business/7073131.stm

development of testing hypotheses, which after observation lead to specific conclusions. Therefore the results obtained from this top-down approach follows logically from premises.

On the other hand the inductive method (also called hill climbing) works the other way around. In this case, research performed goes from specific observations to broader generalizations and theories. It starts with the observation of a certain sample from which is tried to find a pattern based on testing hypothesis leading then to the development of a theory. So the conclusions found in this bottom up-approach are based on the premises defined after observation. As it is next exposed, the research method to be used in this thesis is the deductive one.

H_1 – Information disclosure regarding environmental best practices

Understanding the disclosing methods used by real estate companies is a way to assess the degree of detail and complexity of the information disclosed. Consequently this hypothesis is first relevant to evaluate the effort put through in the activity of communicating the environmental best practices. Second the results obtained at this point will also determine the sample to be considered in the next two hypotheses, since it is only possible to precisely evaluate implemented practices on companies disclosing detailed information (further explained in H_2 and H_3). That is, only companies disclosing CSR reports can be analyzed in the next two hypotheses.

- **Sample**

The sample selected to perform this test is composed by a total of 43 companies listed in 2010 in the real estate sector of the two most important global sustainability indexes: Dow Jones Sustainability Index World and FTSE4GOOD[15] (see full companies list on appendix 1). From this number, 17 companies belong to the first one and 34 to the second one (being then 8 of them common to both indexes). Note that even thought the next two hypotheses involve the analysis of companies information in 2009, the sample selected is from 2010 given that the yearly companies selection to join these indexes is done attending on the previous year performance.

- **Data collection**

According to Patten and Crampton (2004) internet is currently a very important communication medium throughout companies can disclose information regarding a vast array of subjects. Hence, recent studies have been analyzing companies' web pages as a social responsibility

[15] DJSI World (2011), http://www.sustainability-index.com/07_htmle/reviews/review2010_1.html and (FTSE4GOOD, 2011) http://www.ftse.com/Indices/FTSE4Good_Index_Series/Index_Changes.jsp.

disclosure medium and compared policies and practices adopted based on the available online reports.

Therefore this study will be conducted totally on the sample constituents' websites, ascertaining on the different disclosing types of documents where information regarding environmental sustainability may be found for the years of 2006 and 2009.

H_2 – Environmentally sustainable practices implemented

The second hypothesis finds its origins in the motivations behind companies' decisions to engage in corporate social responsibility actions. According to Branco (2006) these motivations may have two different natures. The first one is related with the enlightened stakeholder theory. In this case companies expect that building solid relations with stakeholders may lead to increased financial results by assisting in the development of valuable intangible assets that supports a stronger market positioning resulting in sources of competitive advantage. In the other hand companies also engage in CSR activities to conform to stakeholder norms and expectations regarding the way their businesses should be managed. This idea is associated with the legitimacy theory and the development of stakeholder panels to express companies' adherence to their needs and expectations.

- **Sample**

The sample of this hypothesis is composed by 10 companies in 2009 analyzed in the preceding hypotheses that are disclosing CSR reports in 2006 and 2009.

From all companies with CSR reports for both periods the group of 10 was chosen based on the criteria of highest gross revenue obtained in 2009 (because it is a global sample values were converted to Euro currency rate at the annual report date release – see appendix 2) since the purpose of this thesis is to analyze the best practices adopted in the world largest real estate companies. This sample reflects two major considerations also considered by SustainAbility and UNEP in their survey regarding sustainability report in Brazil (2008): 10 companies reflect a full 23% of all real estate companies listed in Dow Jones Sustainability Index and FTSE4GOOD and it is a small sample once a larger one could entail the risk of including lower-quality reports. Finally the year 2009 was chosen because it is the most recent year with available information, and 2006 since the next question purpose is to evaluate the evolution of the environmental practices implemented between these two years.

- **Data collection**

Therefore the assessment of environmental performance of the world largest real estate companies in 2009 will be conducted through the analysis of their corporate social responsibility reports. These reports are found in their websites or in a global online repository of CSR reports - CorporateRegister.

In order to categorize the available information regarding this subject, the best practices identified will be divided into six categories according to the green building's rating system LEED: energy and atmosphere, indoor environmental quality, sustainable sites, material and resources, water efficiency, and innovation in design. This separation is done to open the possibility to investigate the degree of development of each one of the aspects constituent of this type of buildings and to identify the main practices responsible for it.

American rating system LEED was chosen to conduct this categorization once according to the Green Building Finance Consortium it is one of the world's leading and most developed green buildings' rating systems (see 2.4.3 Key aspects in the sustainable building concept).

H_3 – Evolution of sustainable practices implementation

After assessing the environmental performance in 2009 of the real estate companies that constitute the sample of the previous hypothesis, the present one centers its objective in the analysis of its evaluation.

In order to ascertain on the veracity of this hypothesis, stating that there was a positive evolution on the environmental practices adopted by real estate companies in their buildings between 2006 and 2009, it will be realized a comparison on the information disclosed in their corporate social responsibility reports for both years. Thus, following the same method used to answer the previous research question, this analysis is disaggregated in six categories too (energy and atmosphere, indoor environmental quality, sustainable sites, material and resources, water efficiency, and innovation in design).

- **Sample**

Meeting what is above explained, once the purpose of this hypothesis is to establish a comparison with the results obtained in the previous one, this sample is constituted by the very same group of 10 companies considered in H_2.

- **Data collection**

Once again the data collection process involves gathering and studying CSR reports of 2006 for those ten companies, which is done in their own websites or at CorporareRegister.

After analyzing and classifying the information available (according to LEED six categories) it will be possible to define the state of real estate companies' environmental performance in 2006 and conclude about a favorable evolution. Thanks to the separation of the different best practices adopted, the results achieved also permit to understand the development of the main green buildings sustainability aspects.

H_4 – Financial benefits for shareholders

While the literature on the effective management of business is rich and growing, there is still a question regarding whether a proactive environmental strategy positively influence companies' financial results (Menguc *et all*, 2009).

Since shareholders expectations are currently aimed to the development of a positive relationship between companies' business and environmental preservation (see 2.4.1 Motivation behind sustainable building) it is interesting to verify if real estate companies listed in sustainability indexes (DJSI and FTSE4GOOD) have been presenting better financial results than the non listed ones. This study will be conducted through the analysis of information between 2006 and 2009.

- **Sample**

This hypothesis compares two different samples.

The first one is constituted by the 30 largest companies, in terms of gross rental income, of the same sample considered in the first hypothesis (companies listed in DJSI and FTSE4GOOD) and constitutes the group of the real estate companies adopting best practices regarding environmental sustainability. It can be described that way once according to Dow Jones Sustainability Index Guide Book (2011) and Ground Rules for the Management of the FTSE4GOOD Index Series (2005) that is an obligatory condition to join these indexes. It was decided to filter the first sample to 30 companies in order to get a most standardized sample in terms of companies' size.

The second sample is also composed by 30 randomly selected companies included in Reuter's Real Estate Development sector (which consists of companies engaged in developing, renting and

leasing residential and commercial properties)[16] that do not belong to the first group. Since these companies are not listed in DJSI or FTSE4GOOD it is assumed that they are not implementing as much environmental best practices as the ones from the first group. The list of components of both groups can be consulted in appendices 7 and 8.

- **Data collection**

In order to compare both groups four financial measures will be used: stock price, net income, return on equity (ROE) and return on invested capital (ROIC). which will all be further explained in the findings analysis.

The process of collecting the necessary data to perform the analysis required in this research question was done based on the website Yahoo Finance, Reuters and on companies' financial reports found in their websites for the years of 2006 and 2009.

This chapter exposed the four research questions that are performed in this thesis and explained the method used in the observations conducted. Following on that, the next chapter focuses on addressing the issues raised in the current chapter by presenting and explaining the findings analysis to each testing hypothesis.

[16] Reuters (2011), http://www.reuters.com/sectors/industries/rankings?industryCode=213&view=sales

CHAPTER 4 – FINDINGS ANALYSIS

This chapter presents the results obtained in the analysis conducted on each one of the four research questions of this thesis. Thus it is divided in four parts covering the following subjects:

- Information disclosure regarding environmental best practices;
- Environmentally sustainable practices implemented in 2009;
- Evolution of sustainable practices implementation between 2006 and 2009; and
- Financial benefits for shareholders.

4.1 INFORMATION DISCLOSURE REGARDING ENVIRONMENTAL BEST PRACTICES

The purpose of the first part of the findings analysis is to understand the effort employed in the activities of producing and disclosing information regarding corporate social responsibility. Therefore the first testing hypothesis leads to the analysis of the following subjects:

1. On-line mechanisms used to communicate sustainability strategy and actions;
2. Evolution of the on-line mechanisms used between 2006 and 2009; and
3. On-line mechanisms used by country.

Generally sustainability disclosures can be made through three on-line communication mechanisms: corporate sustainability reports, annual reports; and companies' websites.

The difference between these three types relies on the level of detail of the information disclosed. Corporate sustainability reports are the most detailed sources of information to communicate the sustainability strategy adopted, the operational measures to accomplish it and the periodical/final results achieved. CSR information included in annual reports usually consists in fewer details available, and the focus is dedicated to briefly explain the company intentions towards sustainable goals. The same is applied to the data published in websites, where concrete facts regarding specific policies are hard to identify or not available at all.

Therefore, the analysis conducted aims to first identify the number of real estate companies disclosing corporate sustainability reports in 2006 and 2009 (in order to study the present situation and its evolution), and to ascertain on the ones mentioning sustainability in annual reports or websites in case they do not disclose any CSR report.

After analyzing the 43 real estate companies listed in Dow Jones Sustainability Index and FTSE4GOOD, the results achieved are the following ones:

Table 5 – CSR information disclosure mechanisms

Companies disclosing CSR information		
Type of disclosure	**# Companies**	**% of total gross rental income**
Disclosing CSR reports (either in 2006 and/or 2009)	24	49,9%
Disclosing CSR information on annual reports or websites in 2010[17]	16	31,6%
Not disclosing information in CSR reports, annual reports or websites in 2010	3	18,5%

From these results we conclude that even thought all companies presented in this sample are listed in largely known sustainability indexes, 16 of them are not disclosing solid information regarding their sustainability actions and 3 are not disclosing anything at all. Companies disclosing CSR reports, and hence meeting society expectations, only constitute a half of the sample analyzed in terms of the total gross rental income.

Table 6 – CSR reports disclosure evolution between 2006 and 2009

Companies disclosing CSR reports		
Disclose year	**# Companies**	**% of total gross rental income**
Only in 2006	2	3,7%
Only in 2009	10	23,1%
In 2006 and 2009	12	29,5%

When studying the evolution on the 24 companies disclosing CSR reports in the years of 2006 or 2009 it is clear that more are adopting this type of on-line medium to communicate their sustainability policies, which suffered an increase of 58% between 2006 to 2009 (from 14 to 22 companies). These companies are actively engaging with their stakeholders, hence pursuing the legitimacy to operate from these interested parts in their activity in order to develop a long-term sustainable position in the market.

[17] Due to lack of information regarding the analyzed companies' websites in 2009, it is considered the year of 2010, which is when this study was conducted.

Table 7 – CSR disclosure through annual reports and websites in 2009

Websites and annual reports		
Disclose year	**# Companies**	**% of total gross rental income**
Annual reports	4	5,2%
Company website	4	11,8%
Both	8	15%

From the group of 16 companies not disclosing CSR reports (see Table 5), the majority of them are putting some effort on this activity, trying not to disappoint the minimal society expectations towards their engagement with corporate responsibility. However the information disclosed is still too vague, expressing more good intentions summarized in attractive text lines (with not that much relevancy on it), than specific actions integrated in a well-structured CSR strategy.

Assuming that all the analyzed companies are adopting an active stakeholder dialogue strategy and thus reporting the most important measures and results achieved in this area, it would be expected to find a higher number disclosing CSR reports (since all companies are listed in a sustainability index, which requires minimal environmental standards to be fulfilled).

Table 8 – CSR information disclosure by country

CSR disclosures by country				
Country	**# Companies**	**# Disclosing CSR reports**	**# Disclosing data on annual reports/website**	**Not disclosing CSR information**
UK	16	10	6	0
Australia	9	6	3	0
USA	6	1	2	3
Japan	4	2	2	0
France	3	3	0	0
Singapore	2	0	2	0
Hong Kong	1	1	0	0
New Zeland	1	0	1	0
Netherlands	1	1	0	0

Concerning Table 8, the majority of the companies analyzed are from Australia, UK and USA (representing 72% of the total sample), which may be related with the fact that both indexes examined belong to UK and US, but it also reflects a higher awareness towards environmental sustainability in these countries. However while UK and Australian companies seem to be striving to engage with their stakeholders by adopting CSR best practices, in the US this concept appears not to be an important issue for top management yet. Once society demands represent a significant influence for companies to act responsibility, this may also indicate that the American consumer is not yet demanding real estate operators to move towards a "greener management".

Finally, although a positive evolution was observed, there is still a lot to be done before sustainability becomes a key factor to enhance engagement with stakeholders and to achieve results according to a triple bottom line notion (in terms of economic, social and environmental goals). Thus following the results presented, this hypothesis is solely partially supported.

4.2 ENVIRONMENTALLY SUSTAINABLE PRACTICES IMPLEMENTED IN 2009

Consumers are demanding companies to be more environmentally responsible and to produce eco-friendly products. So in order to evaluate the practices adopted by the world largest sustainable real estate companies, the present subchapter aims to cover the following aspects:

1. Companies' environmental performance according to LEED's six categories;
2. The state of development of the each LEED category; and
3. The main measures implemented by category;

To meet the objectives stated, all environmentally sustainable best practices of the ten companies from the previous sample disclosing CSR reports in 2006 and 2009 were analyzed, through their 2009 CSR reports (the full list of all practices identified can be consulted in appendix 3).

The first challenge arouse when it was observed that the information collected in these reports assumes different forms, from the vaguest ones (expressing good intentions and pretty purposes) to the more specific ones (measuring real benefits achieved with the implementation of sustainability measures), hence leading to the necessity to first define a weighting criteria. That criteria was delineated based in the structure of the Capability Maturity Model (Paulk, 1995), which is used to measure companies' development processes with the purpose of identifying how the established behaviors, practices and procedures can contribute to sustainably produce

outcomes. This model states that the higher the level of detail in the definition of a process, the more developed it is. Thus, to reflect the level of development of the environmental practices implemented by the real estate companies analyzed, the following weights were established:

- Type 1: weight of 1 – information expressing intentions towards environmental sustainability or mentioning inspiring objectives to accomplish, but without specifying concrete practices adopted to do so and the reduction achieved in numerical terms;
- Type 2: Weight of 2 – information specifying concrete practices implemented to increase the environmental sustainability in the developed properties, but without mentioning the reduction achieved in numerical terms;
- Type 3: Weight of 3 – information that states the reduction achieved in numerical terms with the adoption of specific measures., reflecting that a solid environmental strategy is being followed; and
- Type 4: Weight of 4 – attributed to companies awarded with ISO 14001, which reflects that they have significantly invested in identifying and controlling the environmental impact of their activities and improved their environmental performance.

After analyzing the ten CSR reports, identifying the practices therein stated and defining the type of each practice (to which a weight is associated), these are the first results obtained:

Table 9 – Companies environmental rankings in 2009

Number of practices reported and environmental rankings			
Company	**Country**	**# Practices reported**	**Environmental ranking**
GPT Group	Australia	44	90
British Land	UK	33	77
Stockland	Australia	38	70
Mitsui Fudosan	Japan	45	69
Capital Shopping Center	UK	32	64
Land Securities Group	UK	29	61
SEGRO	UK	26	53
Shaftesbury	UK	27	50
Hammerson	UK	20	37
Lend Lease	Australia	17	24

While the number of practices reported is just the sum of practices disclosed in CSR reports (excluding those that are mentioned more than once), the environmental ranking expresses these results weighted with the criteria defined before.

The first important aspect to highlight in this analysis is that 9 of the 10 companies analyzed belong to UK (6) and Australia (3). Once again this may be related with the fact that the indexes selected belong to UK and USA, but it also reflects the development of corporate sustainability in these countries (which is also mentioned in the analysis of the previous hypothesis).

The total number of practices implemented is 311, the average environmental ranking is 59.5 and the average number of practices reported is 31 (these values are important to measure the evolution of the best practices adopted that is conducted in the next hypothesis analysis).

In 2009 GPT Group is the sector leader in terms of positive environmental impact of the measures implemented with a final result of 90 points. In fact this company was also elected by the Dow Jones Sustainability Index as the best sustainable company in the real estate sector[18].

It is also important to ascertain the level of detail of the measures implemented in order to understand the overall maturity level of environmental sustainability inside these companies.

Table 10 – Companies' environmental sustainability ratio in 2009

Environmental sustainability ratio			
Company	**# Practices reported**	**Environmental ranking**	**Environmental sustainability ratio**
British Land	33	77	2,33
Land Securities Group	29	61	2,10
GPT Group	44	90	2,05
SEGRO	26	53	2,04
Capital Shopping Center	32	64	2,00
Shaftesbury	27	50	1,85
Hammerson	20	37	1,85
Stockland	38	70	1,84
Mitsui Fudosan	45	69	1,53
Lend Lease	17	24	1,41
Average	**30**	**59,5**	**1,90**

[18] Real estate sector leader, DJSI (2010), http://www.sustainability-index.com/07_htmle/indexes/djsiworld_Supersectorleaders_10_1.html

The environmental sustainability ratio is the quotient between the environmental ranking and the number of practices reported. Examining the maturity level of the practices implemented in buildings according to this quotient, points to an average value near 2. Attending to the types of information disclosed defined above, this means that companies are implementing concrete practices to increase the environmental sustainability in their buildings, but do not mention yet the reduction achieved in numerical terms. This is also confirmed by the sum of the type of the measures implemented, which is presented below.

Table 11 – Total practices implemented by type of detail in 2009

Practices by type	
Type of detail	**# practices reported**
Type 1	90
Type 2	161
Type 3	57
Type 4	3

While the type 2 is predominant with 52%, 29% of the practices reported still constitute statements of good intentions and inspiring objectives to achieve (type 1) rather than specific actions. Only 18% of them are in the ultimate development stage, where benefits obtained from the actions implemented can be measured (type 3). Finally, from the 10 companies analyzed, 3 of them were awarded with ISO 14001 (type 4).

Returning to the analysis of Table 10, for companies that achieved a higher position in this table than in Table 9, this means that they may be implementing fewer measures, but the ones actually implemented are specific practices, rather than just good intentions (since Table 9 is sorted to present companies with higher environmental ranking first and Table 10 to present companies with higher environmental sustainability ratio first).

So for these cases, the sustainability strategy adopted is focused on addressing issues deeply with further resources allocated to it (higher weights per practice are predominant). In the other hand, for the opposite situation, companies are facing their environmental objectives with less effort employed in each specific action (lower weights per practice are predominant). For both situations these conclusions are independent of the total number of practices implemented.

LEED's six categories have different weights according to their importance and contribute to minimize buildings' environmental footprint (see 2.4.3 Rating systems for sustainable buildings). Therefore it is also important to analyze companies' performance weighted with the proper value associated with each category. The weights for each category are the following ones: energy and atmosphere - 25%; indoor environment quality - 22%; sustainable sites - 20%; materials and resources - 19%; water efficiency - 7%; innovation in design - 7%. The outcome obtained after this process is presented in the next table.

Table 12 – Companies weighed environmental rankings in 2009

Weighted environmental ranking		
Company	**Environmental ranking**	**Weighted Environmental ranking**
GPT Group	90	16,6
Stockland	70	12,9
British Land	77	12,8
Capital Shopping Center	64	11,8
Mitsui Fudosan	69	11,2
Land Securities Group	61	10,7
SEGRO	53	10,7
Shaftesbury	50	8,5
Hammerson	37	7,5
Lend Lease	24	5,2
Average	**59,5**	**10,8**

After conducting the weighting process, the results achieved present companies sorted by the weighted environmental ranking in descendent order. This outcome constitutes the most appropriate indicator to evaluate the best practices implemented by the real estate operators analyzed, once it takes into account the importance of the different categories in which those practices are filled in. The average of the weighted environmental ranking is 10.8 (once again this value is important to measure the evolution of the best practices adopted, which is conducted in the next hypothesis analysis).

In order to understand companies' level of compliance with the categories importance (measured by the weights assigned to each category by LEED), by proportionally investing in practices according to the most appropriate categories (that means higher investments in categories with higher weights), it is showed next a table summarizing this study.

Table 13 – Companies' dispersion ratio in 2009

Dispersion ratio			
Company	**Environmental ranking**	**Weighted Environmental ranking**	**Dispersion ratio**
Lend Lease	24	5,2	4,64
Hammerson	37	7,5	4,94
SEGRO	53	10,7	4,98
GPT Group	90	16,6	5,41
Stockland	70	12,9	5,41
Capital Shopping Center	64	11,8	5,45
Land Securities Group	61	10,7	5,71
Shaftesbury	50	8,5	5,86
British Land	77	12,8	6,01
Mitsui Fudosan	69	11,2	6,15
Average	**59,5**	**10,8**	**5,46**

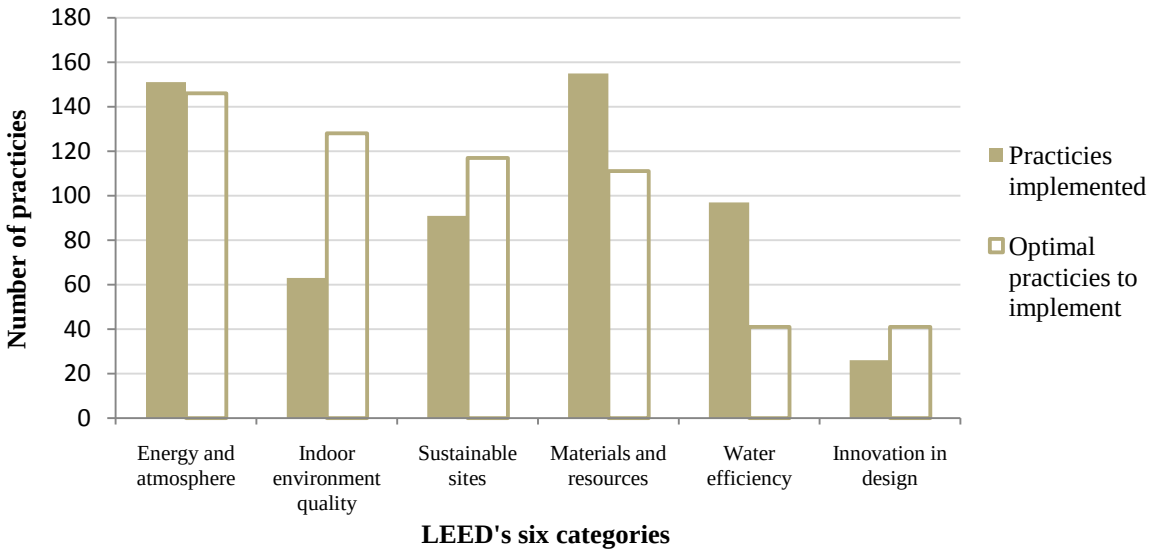
The dispersion ratio (environmental ranking divided by the weighted environmental ranking) measures how distant are companies from aiming their efforts to the adoption of sustainability practices according to LEED's category weights.

Thus, a company with a lower dispersion ratio is coordinating better its sustainability strategy according to the different levels of importance of LEED's six categories. This is relevant to understand how these companies are managing the allocation of resources according to the type of practices to implement.

For companies achieving a higher position inTable 1 Table 13, than in Table 12, this means that they are seeking to minimize the environmental footprint of its buildings according to the most important issues to address.

Finally the last aspect to investigate in this analysis is the distribution of the practices adopted by the six categories considered.

Figure 1 – Implemented practices by category in 2009



The brown bars indicate the number of practices implemented per category by the analyzed companies, while the white bars indicate the optimum number of practices to be implemented according to LEED's weights to each category.

In fact only the category energy and atmosphere is actually following that proportion. Materials and resources and water efficiency have more practices associated to them than recommended (in terms of proportion against the other categories) because of three possible reasons: (1) the required human and financial resources to implement them are lower; (2) there was a lot of sustainable options to explore in these categories; (3) society expectations are looking forward to see changes happening regarding these subjects. The opposite is verified to indoor environment quality, sustainable sites and innovation in design (probably due to causes contrary to the ones mentioned above). However this thesis is not focused in studying the exact causes behind these cases.

The analysis of this hypothesis finishes with the presentation of the three most implemented practices by each category. This pretends to ascertain if these practices follow what was stated by UNEP's Global Environment Outlook (2007) and Maczulak (2009) about the most important measures to adapt to reach environmentally sustainable development.

Table 14 – Main practices implemented by category in 2009

Energy and atmosphere	Indoor environment quality
▪ Wind power as a low carbon technology; ▪ Energy-conserving air conditioning systems; and ▪ Lighting with energy-efficient alternatives.	▪ Natural ventilation; ▪ Low-energy and motion- triggered lighting; and ▪ Building insulation.
Sustainable Sites	**Materials and Resources**
▪ Investments in "brownfield" sites; ▪ Encourage sustainable transport like public transport, cycling and walking; and ▪ Planting and protecting trees.	▪ Recycled content in structural materials; ▪ Waste facilities to maximize recycling; and ▪ Durable, fire-proof and easy maintenance materials;
Water efficiency	**Innovation in design**
▪ Rainwater harvesting systems; ▪ Motion-operated taps; and ▪ Wastewater reused as toilet flushing water.	▪ Modern spaces; ▪ Roof areas landscaped with horticulture; and ▪ Green building accredited professionals.

The Global Environment Outlook published by the UNEP in 2007 establishes a set of best practices to be adopted by companies from all sectors to reduce human's environmental footprint. When comparing those best practices (see 2.3 Environmental issues and subsequent topics) with the ones being implemented by the real estate companies in their buildings (summarized in the previous table) it can be concluded that this group is following worldwide recommendations of the best practices to adopt.

These practices are also in line with what Maczulak (2009) mentioned it were the actions accepted or becoming accepted concerning the development of sustainable buildings (see 2.4.4 Sustainable building trends and challenges). Moreover the same author identifies some challenges in sustainable buildings that still need a solution and a part of them are already being addressed by some of the analyzed companies, like electricity and water waste reduction.

Therefore it can be concluded that the whole study performed in this subchapter leads to the support of the second hypothesis.

4.3 EVOLUTION OF THE SUSTAINABLE PRACTICES IMPLEMENTED BETWEEN 2006 AND 2009

While the previous study analyzed the state of development of the environmental best practices adopted by the real estate companies in their buildings in 2009, the current hypothesis focuses in understanding its evolution since 2006.

Thus following the same methodology adopted in the precious hypothesis, regarding the analysis of the CSR reports and the weights to apply to each practice identified (according to its level of detail), it will be conducted a study to compare the evolution of the seven indicators mentioned in the previous hypothesis (number of practices, environmental ranking, environmental sustainability ratio, number of practices reported per type, weighted environmental ranking, dispersion ration and practices implemented by category).

In accordance to that, the primary results achieved regarding the number of practices reported and the environmental ranking evolution are presented next (the full list of all practices identified can be consulted in appendix 4).

Table 15 – Environmental ranking evolution between 2006 and 2009

Number of practices reported and environmental ranking				
Company	**# Practices reported in 2006**	**Variation 2006-2009**	**Environmental ranking in 2006**	**Variation 2006-2009**
British Land	40	-17,5%	66	16,7%
Capital Shopping Center	32	0,0%	61	4,9%
GPT Group	31	41,9%	58	55,2%
Stockland	33	15,2%	49	42,9%
Land Securities Group	24	20,8%	45	35,6%
SEGRO	30	-13,3%	42	26,2%
Mitsui Fudosan	21	114,3%	33	109,1%
Shaftesbury	23	17,4%	32	56,3%
Hammerson	15	33,3%	31	19,4%
Lend Lease	19	-10,5%	23	4,3%
Average	**27**	**20,2%**	**44**	**37%**

The first aspect to notify is that the overall number of practices reported (practices mentioned more than once are excluded) increased 20.2%, from 268 in 2006 to 331 in 2009. The same happened with the average environmental ranking rising in average 37% from 44 in 2006 to 59.5 in 2009.

While in 2006 the sector leader was GPT, in 2006 this real estate operator occupied the third place, being British Land the number one. However, it is not possible to compare this mark with Dow Jones Sustainability Index awards (as it was done for 2009), once in 2006 there was no data available on this subject.

Concluding that there was a clear positive evolution between the results achieved in both years regarding the number of practices implemented and the overall environmental rankings (implemented practices weighted with the criteria that define their state of development), it is also important to understand the stage of development of companies' environmental sustainability is 2006.

Table 16 – Environmental sustainability ratio evolution between 2006 and 2009

Environmental sustainability ratio		
Company	**Environmental sustainability ratio in 2006**	**Variation 2006-2009**
Hammerson	2,07	-10,5%
Capital Shopping Center	1,91	4,9%
Land Securities Group	1,88	12,2%
GPT Group	1,87	9,3%
British Land	1,65	41,4%
Mitsui Fudosan	1,57	-2,4%
Stockland	1,48	24,1%
SEGRO	1,40	45,6%
Shaftesbury	1,39	33,1%
Lend Lease	1,21	16,6%
Average	**1,64**	**17,4%**

Following the results achieved in Table 15, presenting a positive evolution in companies' environmental ranking, the environmental sustainability ratio suffered an increase too.

While in 2009 this ratio points to an average of 1.9, in 2006 it is only 1.64. Thus, in 2006 the type of practices implemented is closer from the weight of 1 than in 2009. So at that time companies' sustainability strategy was still in its early stages, expressing more good intentions or inspiring objectives than specific practices adopted or specific benefits achieved in numerical terms. This is also confirmed by the results presented in the following table, which also reflect the state of development of the other three types of weights considered in this study.

Table 17 – Evolution of the practices implemented by type of detail between 2006 and 2009

Practices by type		
Type of detail	**# practices reported**	**Variance 2006-2009**
Type 1	123	-26,8%
Type 2	120	34,2%
Type 3	23	147,8%
Type 4	2	50,0%

While the type 1 is predominant with 46%, 45% of the practices constitute specific actions (type 2). And only 9% of them are in the ultimate development stage, where benefits obtained from the actions implemented can be measured (type 3). Finally, from the 10 companies analyzed, solely 2 were awarded with ISO 14001 in 2006 (type 4). Thus, it is clear the development achieved in the practices adopted in these 3 years, moving from type 1 to type 2; from wishful thinking to specific actions.

Recalling what is explained in the previous subchapter, companies that achieved a higher position in Table 10 than in Table 15, are implementing specific practices, rather than just communicating good intentions (since Table 15 is sorted to present companies with higher environmental ranking first and Table 16 to present companies with higher environmental sustainability ratio first). In these cases, the sustainability strategy adopted is focused on addressing issues with higher resources allocated to it; while for the opposite situation companies are facing their environmental objectives with less effort employed in each specific action.

The next indicator used to compare the implementation of environmental practices between 2006 and 2009 is the weighted environmental ranking.

The rationale behind this indicator is based in the environmental ranking, which is then weighed up with the weight assigned to each LEED category related with each specific practice. Those categories and respective weights are: energy and atmosphere - 25%; indoor environment quality - 22%; sustainable sites - 20%; materials and resources - 19%; water efficiency - 7%; innovation in design - 7%. The weighted environmental ranking for 2006 is presented in the following table.

Table 18 – Weighed environmental ranking evolution between 2006 and 2009

Weighted environmental ranking		
Company	**Weighted Environmental ranking**	**Variation 2006-2009**
British Land	11,17	14,8%
Capital Shopping Center	10,76	9,2%
GPT Group	9,69	71,6%
SEGRO	8,57	24,3%
Land Securities Group	8,33	28,2%
Stockland	8,02	61,2%
Hammerson	6,21	20,6%
Shaftesbury	5,74	48,6%
Mitsui Fudosan	5,31	111,3%
Lend Lease	4,01	28,9%
Average	**7,78**	**41,9%**

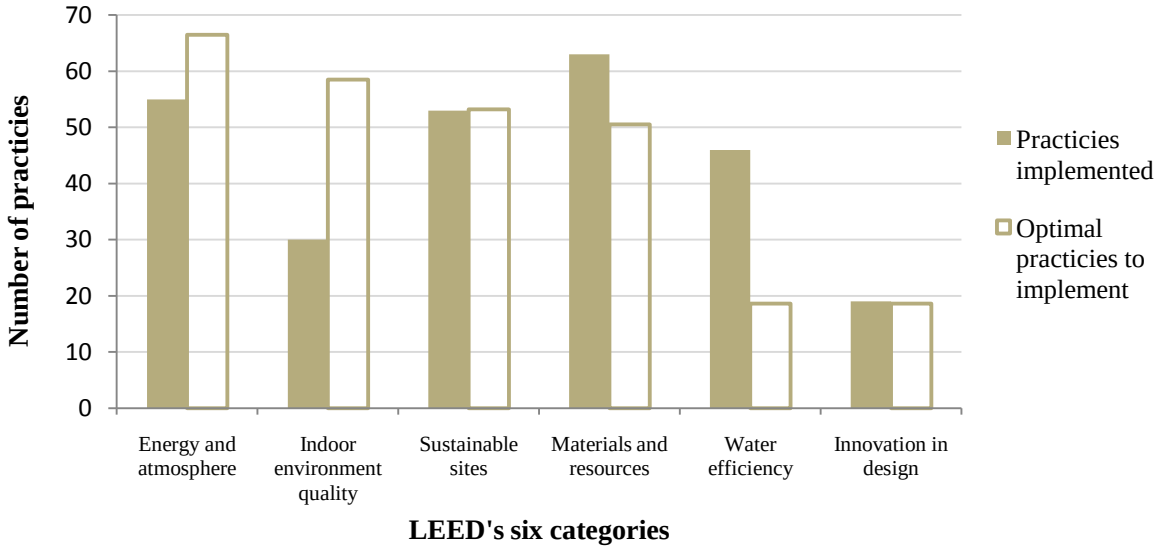
As expected the average weighted environmental ranking for the analyzed companies was also higher in 2009, raising from 7.78 in 2006 to 10.8. When comparing the evolution of the weighted environmental ranking against the environmental ranking, the first one raised 41.9%, while the second one raised 17.4%. Once the weighted environmental ranking incorporates the weights attributed by LEED to each category according to the measures adopted, this means that between 2006 and 2009 companies are implementing sustainability best practices in a less efficient way (once the first indicator increased more than the second one, thus resulting in a larger dispersion). In order to confirm these values it is important to conduct the study of the dispersion ratio for 2006, which measures how distant are companies from implementing sustainability practices according to the different weights of each LEED category.

Table 19 – Dispersion ratio evolution between 2006 and 2009

Dispersion ratio		
Company	**Dispersion ratio**	**Variation 2006-2009**
Mitsui Fudosan	6,21	-1,0%
Stockland	6,11	-11,4%
GPT Group	5,99	-9,6%
British Land	5,91	1,7%
Lend Lease	5,74	-19,1%
Capital Shopping Center	5,67	-3,9%
Shaftesbury	5,57	5,1%
Land Securities Group	5,40	5,7%
Hammerson	4,99	-1,0%
SEGRO	4,90	1,5%
Average	**5,46**	**-3,2%**

The dispersion ratio rose from 5.46 in 2006 to 5.65 in 2009. Hence it can be concluded that in 2009 the practices implemented are slightly more distant from the optimum distribution (defined by LEED's category weights). In order to understand the dispersion of the global practices implemented by category, versus the optimum distribution, the following illustration is presented:

Figure 2 – Implemented practices by category in 2006



The brown bars indicate the number of practices implemented per category by the analyzed companies, while the white bars indicate the optimum number of practices that should be implemented according to LEED's weights to each category. Similarly to 2009, the material and resources and water efficiency categories are the ones capturing higher investments according to their relative environmental impact (some possible consequences behind this situation were explained in the previous hypothesis analysis).

Finally, the next table describes the three most implemented best practices in 2006.

Table 20 – Main practices implemented by category in 2006

Energy and atmosphere	Indoor environment quality
▪ Wind power as a low carbon technology; ▪ Low energy lighting fittings; and ▪ Energy benchmarking tools.	▪ Natural ventilation; ▪ Control of space heating ; and ▪ Natural light.
Sustainable Sites	**Materials and Resources**
▪ Green space incorporated on developments; ▪ Car share incentive scheme; and ▪ Development of public transport infrastructure.	▪ Recycled concrete and steel; ▪ Recycling waste bins; and ▪ Waste management plan since earliest stages of building construction.
Water efficiency	**Innovation in design**
▪ Water restrictors on taps; ▪ Greywater used for toilets; and ▪ Cisterns and time switches on urinals.	▪ Shopping areas with space for residential apartments; and ▪ Designs to maximize noise insulation.

In accordance to what was verified in 2009, the most implemented best practices in each category follow what is established by the Global Environment Outlook (UNEP, 2007) and Maczulak (2009) as the most relevant ones to adopt.

To conclude this study, according to the positive variance obtained in six of the seven analyzed indicators (only the dispersion ration is slightly negative) it can be concluded that the analysis performed in this subchapter leads to the support of the third hypothesis.

4.4 FINANCIAL BENEFITS FOR SHAREHOLDERS

The last hypothesis to test in this thesis is related with the potential benefits for the shareholders of real estate operators investing in environmental sustainability.

Recalling subchapter 3.2 Method used, the logic of this hypothesis is based in the comparison between the 30 largest companies belonging to Dow Jones Sustainability Index and FOOTSIE4GOOD (the sustainable group) versus the 30 largest companies from Reuters' index real estate sector index (the non sustainable group).

In order to ascertain if environmentally sustainable real estate companies are more attractive to shareholders, four financial indicators will be analyzed for both groups in the years of 2006 and 2009: net income (after taxes), return on equity (ROE), return on invested capital (ROIC) and share price. The rationale supporting the choice of these four indicators is the following:

- Net income in order to understand if the company was able to generate higher revenues. An increase in the net income may be related with the customer perception that the company is implementing sustainable practices and therefore, it would be taken as evidence that its sustainably police acts as a competitive advantage;
- ROE and ROIC as relative measures, representing the efficiency of the invested capital. The purpose is to estimate the variation in terms of financial efficiency following the investment in sustainable practices to ascertain if they result in higher returns; and
- Share price acts as a reflection of the company reality and fundamentals, measuring its current value (Fama, 1965), which at an ultimate analysis, would also reflect the global effect the sustainable practicies implemented would have in the indicators that contribute to the firm value.

To conduct this study it were considered three assumptions: (1) companies from both groups have such a dimension and importance, that the effects due to the adoption of sustainable practices would not be explained and changed by the size; (2) differences in geographical location of companies are irrelevant (once both samples contain companies from all around the world); and (3) once both samples contain companies from different countries, to avoid disruptions in the results, due to the effect of the exchange rates, the values will be compared based in variations in their own currency (no conversion to a single currency is made).

- **Net income**

The net income is the residual income of a company (total revenues subtracted by the total costs), which can be later distributed to its shareholders. Fundamentally, it is an indicator that is an approximate accounting proxy to measure their potential return for investing in that company.

Comparing the evolution of the average net income for both groups in 2006 and 2009, the results achieved are the following:

Table 21 – Net income variation between 2006 and 2009

Net income	
Group	**Average Variation 2006-2009**
Sustainable group	-63,77%
Non sustainable group	-91,54%

The higher the net income, the higher the probability of a shareholder receives a higher dividend. However the years analyzed were a period of a strong financial crisis caused by the American subprime, which explains the negative values found in the net income variation. Nevertheless the sustainable group faced a significantly lower annual average variation than the non sustainable one.

- **Return on equity**

The return on equity measures the rate of return of a shareholder for the share it owns. Basically it is the reward for the risk taken in investing in a specific company.

Comparing the evolution of the average return on equity for both groups in 2006 and 2009, the results obtained are the following:

Table 22 – Return on equity variation between 2006 and 2009

ROE	
Group	**Average Variation 2006-2009**
Sustainable group	-70,79%
Non sustainable group	-57,98%

Following a negative variation in net income, the return on equity evolution is also negative for both groups. Comparing to the net income, this indicator presents the ratio between the return that can be received by shareholders (once net income may not be fully distributed to shareholders, and usually it is not) against the equity invested in the company. Therefore while the sustainable group suffered a lower decrease in net income than the non sustainable one, when considering the variation in proportion of equity return the situation inverts. This means that the non sustainable group has not faced a so high decrease in the rewarding offered to its investors for the each unit of the invested capital, as the sustainable one.

- **Return on invested capital**

The return on invested capital measures the level of cash flow generated according to the total invested capital in a business.

Note that ROIC can also be calculated using the net operating profit less adjusted taxes (NOPLAT) in the denominator however to simplify the analysis to be conducted and be consistent with the first indicator chosen, it was assumed simply the net income after taxes. Comparing the evolution of the average return on invested capital for both groups in 2006 and 2009, the results observed are the following:

Table 23 – Return on invested capital variation between 2006 and 2009

ROIC	
Group	**Average variation 2006-2009**
Sustainable group	-78,58%
Non sustainable group	-98,01%

The additional vision brought by this indicator is the fact that it supports the comparison between shareholders' potential return (in accounting terms) and the total capital invested in the company. While ROE evolution is less low for the non sustainable group, ROIC variation is less low for the sustainable one, which means that when taking into the account the company full assets, the

sustainable companies suffered a lower decrease, which may reflect that they did not become so unattractive to invest like the non sustainable.

- **Share price**

The share price of a company reflects not only its present value but also the future expectations shareholders have regarding the future evolution of its cashflows.

Comparing the evolution of the average share price for both groups in 2006 and 2009, the results achieved are the following:

Table 24 – Share price between 2006 and 2009

Share price	
Group	**Average variation 2006-2009**
Sustainable group	-51,18%
Non sustainable group	-31,03%

Theoretically, to perform an analysis to a variation in the share price there should be considered more than 2 periods. However, once the purpose of this study is just to understand the difference between its values in two moments of time and not to investigate its evolution throughout that time, it were only considered the share price at the last trade day of 2006 and 2009.

Not surprisingly share price followed the same trend of the remaining indicators, recording a decrease. These negative values can be influenced by the current performance of the company or by the low expectations regarding its future performance. However taking into account the period of crisis hereby involved it may reflect the sense of shareholders towards lower expected returns. And once again the situation inverts and the non sustainable companies are the ones performing less badly.

Before advancing to the conclusion of this hypothesis it is important to highlight that the study conducted may have some limitations regarding: (1) the number of companies analyzed – only 30, due to the reduced number of companies in sustainability indexes); (2) number of periods analyzed – only two years considered; (2) difficulty to measure image, notoriety and client satisfaction derived from the adoption of environmental practices; and (3) the period chosen – a serious financial crisis started in 2007, which may skew the results achieved.

The purpose of this analysis was to ascertain on which group of companies has been performing better since 2006. To characterize their competitive position, it was analyzed the average value of ROE and ROIC on both groups.

Summing up the results achieved with this study, the sustainable group performed better in the net income and ROIC indicators, while the non sustainable group obtained higher evolutions in ROE and share price. Therefore due to the lack of compliance in the data of the four presented indicators, this hypothesis is rejected, which leads to the conclusion that it cannot be confirmed that companies with higher environmental performance are also the ones with better financial results.

CHAPTER 5 - CONCLUSIONS

The final chapter of this thesis presents the conclusions found in the study conducted throughout the previous chapter, identifies the limitations to the results achieved and suggests some future research guidelines.

5.1. FINAL REMARKS

Climate change has become a major global issue. The average temperature has increased in the twentieth century leading to sea level rise, increasing frequency of heat waves, storms floods and droughts. And the expected increase in temperature for the current century will accentuate these issues even further.

One of the main factors contributing to the environmental degradation is the consumption of energy in buildings usage and development. Therefore the purpose of the present thesis was to analyze the implementation of environmental best practices by the world largest real estate companies and to ascertain on the potential benefits for their shareholders.

In order to accomplish that it was first selected a sample with 43 real estate companies listed in the sustainable indexes Dow Jones Sustainability Index and FTSE4GOOD. The second step involved the analysis of corporate documents disclosing their environmental performance and financial indicators.

Following that, it was found some interesting conclusions.

First, even though all companies analyzed are listed in sustainability indexes, roughly 45% of them are not disclosing corporate social responsibility reports (which is the most appropriate mechanism to address this subject) or detailed environmental data regarding their performance. Nevertheless the number of companies disclosing CSR reports in 2009 increased by 58%, showing that most of them are actively engaging with their stakeholders, hence pursuing their legitimacy to operate and to develop a long-term sustainable position in the market. Additionally 72% of the sample constituents belong to UK, USA and Australia, highlighting the general awareness in these countries towards environmental sustainability

Second, the ten companies analyzed in 2009 disclosed a total of 331 best practices. However it is also important to understand the type of practices mentioned in the reports, once they reflect different stages of development. After attributing different weights to the different types of measures implemented it is concluded that real estate companies are in a stage of implementing

concrete practices to increase the environmental sustainability in their buildings, but generally do not mention yet the reductions achieved in numerical terms (which is the next step move to). Not only important is the detail of the practices implemented, but also the environmental category they are associated with. According LEED's six categories, it was found that real estate companies are focusing mainly in addressing issues concerning energy and atmosphere, water efficiency and materials and resources.

Third, when comparing these results with the ones obtained in 2006, it is clear the positive evolution faced. From a total number of 268 practices implemented in 2006, it was registered a growth of 20.2% to 331 in 2009. However not only the number of practices implemented increased, but also their development stage. In 2006 companies' sustainability strategy was still in its early stages, expressing more good intentions or inspiring objectives than specific practices adopted (stage of development in 2009) or specific benefits achieved in numerical terms. Nonetheless, there was an aspect that did not change, which was the environmental area of focus of these practices, once again: energy and atmosphere, water efficiency and materials and resources. For both years the justifications for companies to invest more in these categories may be related with lower required human or financial resources, more sustainable options to explore in these categories or society expectations that are looking forward to see changes happening regarding these subjects.

Fourth, the financial analysis conducted lead to inconclusive results regarding the higher attractiveness for shareholders to invest in eco-friendly real estate companies. In this hypothesis the first group of companies (the ones listed in the sustainability indexes) was compares with another group with the same financial characteristics, but not investing in sustainability (once none of its components is listed in sustainability indexes). Net income, return on invested capital, return on equity and share price were the four indicators analyzed and for the first two the sustainable group performed better and the opposite happened for the last two.

Summing up, the findings of this thesis suggest that a positive trend in the adoption of more detailed disclosing methods regarding the sustainability strategy of these organizations. The same trend is verified in the implementation of environmental best practices, which is translated in building ecologically more efficient. However, it cannot be accurately concluded that group of sustainable companies reported financial results more attractive for shareholders.

5.2. LIMITATIONS

This thesis faces some limitations that were tried to be minimized, but nevertheless have to be highlighted. The analysis to ascertain on companies environmental best practices implementation is based on the CSR reports disclosed that may disrupt the reality of facts. The fact that only 10 companies were analyzed can be considered a low number to be a solid representation a whole industry. And finally the financial analysis performed only compares values from one period with another one, and hence not analyzing the facts occurred is between.

5.3. FUTURE RESEARCH

Attending on the analysis conducted throughout the present thesis, this subchapter presents some suggestions and guidelines for future research on the sustainable development field:

- To analyze environmental best practices in different sectors that are also key to reverse the effects of climate change;
- To compare different industries listed in sustainability indexes (or companies listed in sustainability indexes with not listed ones for the same industries) to conclude on their financial attractiveness;
- To compare the financial performance of industries listed in different sustainability indexes;
- To analyze the financial performance evolution of companies after joining sustainability indexes (and the opposite, for companies leaving them);
- Ascertain on the level of effort to implement different sustainability measures and relate them with the most important ones to minimize the effects of climate change; and
- Try to understand the different cultural aspects with the state of development of sustainability in different zones or regarding different market sectors.

REFERENCES

Bauher, M., Mosle, P., Shwarz, M. (2007) *Green Building – Guidebook for Sustainable Architecture*. Stuttgart: Springer Heidelberg Dordrecht

Boulding, Kenneth Ewart (1966) *The Economics of the Coming Spaceship Earth, H. Jarrett (ed.), Environmental Quality in a Growing Economy*. Baltimore, MD: Resources for the Future/Johns Hopkins University Press, 3-14.

Branco (2006), *Essays on Corporate Social Responsibility and Disclosure*. PhD Thesis in Management Sciences, Universidade do Minho

Bruntland, G (1987) *Our Common Future: The World Commission on Environment and Development*. Oxford: Oxford University Press

Burney, A. (2008) *Inductive and Deductive Approach*. Karachi: UBIT
Menguc, B., Auh, S., Ozanne, L. (2009) *The Interactive Effect of Internal and External Factors on a Proactive Environmental Strategy and its Influence on a Firm's Performance*, Journal of Business Ethics, 279 – 298

Cartwright, W. and Craig, J. (2006), *Sustainability: aligning corporate governance, strategy and operations with the planet*. Business Process Management Journal, vol. 12 No. 6, 741-750

Crabbe, P. J. (1997) *Sustainable development: Concepts, Measures, Market and Policy Failures at the Open Market. Industry and Firm Levels*: Ottawa, Industry Canada

Daly, Herman E. (1977). *Steady-state Economics: the Economics of Biophysical Equilibrium and Moral Growth*. San Francisco: W.H. Freeman

Donella H. Meadows, Dennis l. Meadows, Jorgen Randers, William W. Behrens III (1972), *The Limits of Growth. A Report for The Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books

Fama, E. (1965), *The Behavior of Stock Market Prices*. Journal of Business 38, 34 – 105

Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*. Englewood Cliffs, New Jersey: Prentice-Hall

Gonçalves, R. (2010), *A Batalha Ecológica das PSI20*, Diário Económico, 14-15

Grey, W. (1996). *Possible Persons and the Problem of Posterity*. Environmental Values 5, 161-179.

Health, J. and Norman, W. (2004), Stakeholder Theory, Corporate Governance and Public Management, *Journal of Business Ethics*, 53, 247-265

Hopkins, M. (2004), *Corporate social responsibility: an issues paper*. Geneva: International Labour Office

Hug, V. (2009) *Bridging the Valley of Death: public support for commercialization of eco-innovation*. Kongens Lyngby, COWI

Kohn (1998), *Thinking in terms of system hierarchies and velocities. What makes development sustainable?*, Ecological Economies 26, 173-187

Lantos, G. (2001), The boundaries of strategic corporate social responsibility, *Journal of Consumer Marketing*, 18, 630-696

Lopes, C. (2010), *Mudanças de paradigmas novas oportunidades*. Diário Económico, 62

Norman, W. and MacDonald, C. (2003), Getting to the Bottom of "Triple Bottom Line", *Journal of Business Ethics*, 10-19

Maczulak, A. (2009), *Renewable Energy: Sources and Methods*. New York: Infobase Publishing

Paulk, Mark C.; Weber, Charles V; Curtis, Bill; Chrissis, Mary Beth (1995), *The Capability Maturity Model: Guidelines for Improving the Software Process*. Boston: Addison Wesley

Solow, Robert M, 1992. *Proceedings of a Symposium on Productivity Concepts and Measurement Problems: Welfare, Quality and Productivity in the Service Industries*, Uppsala: Introduction, Scandinavian Journal of Economics, Blackwell Publishing, vol. 94, pages 5-7

Tavares, J. (2010) *Sustentabilidade, Um Desafio Civilizacional*, OJE, 1-6

Tuzzolino, F., Armandi, B. R. (1981), *A Need Hierarchy Framework for Assessing Corporate Social Responsibility*, The Academy of Management Review, vol.16, 21–28.

Yates, L.. (2008) *Sustainable consumption: the consumer perspective*. Consumer Policy Review. vol 18 (4), 96–99

Unpublished references taken from the internet:

Accountability (2008), AA1000 Accountability Principles Standard, http://www.accountability.org/images/content/0/7/074/AA1000APS%202008.pdf

AcountAbility (2010), Sustainability road to credibility, http://www.sustainability.com/library/the-road-to-credibilityvfsvfqdvbfwrgf-credibilityvfsvfqdvbfwrgf?path=roadtocredibility

BREEAM (2010), BREAM, http://www.heepi.org.uk/BREEAM%20Event/Ferguson%20Brown.pdf

Dow Jones Sustainability Index (2010) DJSI World Guidebook, http://www.sustainability-index.com/07_htmle/publications/guidebooks.html

Energy Control Inc (2007), Energy Consumption by Sector USA, http://www.need.org/needpdf/infobook_activities/IntInfo/ConsI.pdf
European Union (2004), 6th Environmental Action Plan, http://ec.europa.eu/environment/natres/pdf/final_report_wg1.pdf

European Union (2007), Action on Post climate change, http://www.europa-eu-un.org/documents/en/070531_eu_action_against_climate_change.pdf

European Union (2009), Sustainable Development Strategy, http://register.consilium.europa.eu/pdf/en/06/st10/st10117.en06.pdf

FTSE4GOOD (2006), Ground Rules for the management of FTSE4GOOD, http://www.ftse.com/Indices/FTSE4Good_Index_Series/Downloads/indexrules.pdf

Global Reporting Index (2006), G3 Guidelines, http://www.globalreporting.org/NR/rdonlyres/ED9E9B36-AB54-4DE1-BFF2-5F735235CA44/0/G3_GuidelinesENU.pdf

Green Building Movement (2003), White Paper on Sustainability, http://www.usgbc.org/Docs/Resources/BDCWhitePaperR2.pdf

OCDE (2010), Environment Issues, http://www.oecd.org/department/0,3355,en_2649_33713_1_1_1_1_1,00.html

ISO (2010), ISO 26000 - Project Overview (2010). http://www.iso.org/iso/iso_26000_project_overview.pdf

Opinion Research Corporation (2009), Cost Not a Deterrent to being Green and environmentally friendly, http://www.hooverandstrong.com/blog/archives/120/

Sustain Magazine (2010), BREEAM vs LEED, http://www.sustainmagazine.com/pages/GNVB%20pages%2035-50.pdf

UNEP (2004), Common Carbon Metric, http://www.unep.org/sbci/pdfs/UNEPSBCICarbonMetric.pdf

United Nations Global Compact (2007), Corporate Citizenship in the World Economy, http://www.undp.org.my/uploads/Global%20Compact%20TT%2029%20Mar%2007.pdf

United Nations Environmental Program (2007), Global Environment Outlook, http://www.unep.org/geo/GEO3/english/pdf.htm

United Nations Global Compact (2010), Setting up a Multi-Stakeholder Panel as a Tool for Effective Stakeholder Dialogue, http://www.unglobalcompact.org/docs/issues_doc/human_rights/Resources/Stakeholder_Panels_Good_Practice_Note.pdf

World Business Council for Sustainable Development (2001) Stakeholder Dialogue, http://www.wbcsd.org/DocRoot/xxBp16bdV46Ui2JpR1CC/stakeholder.pdf

World Business Council for Sustainable Development (2002) The WBCSD's journey, http://www.econsense.de/_CSR_INFO_POOL/_INT_VEREINBARUNGEN/images/CSR_TheWBCSDJourney.pdf

APPENDICES

Appendix 1: List of the 43 companies that constitute the first sample of this thesis:

Companies	Country	Index	Gross Rental Income FY 2009 (m€)
Mitsui Fudosan Co.	Japan	FTSE4GOOD	4.206,75
Simon Property Group	USA	FTSE4GOOD	2.606,55
Westfield Group	Australia	FTSE4GOOD	2.528,11
General Growth Properties	USA	FTSE4GOOD	2.516,31
Realogy	USA	FTSE4GOOD	2.003,33
Unibail	France	Both	1.472,90
Public Storage	USA	FTSE4GOOD	1.129,39
Aeon Mall	Japan	FTSE4GOOD	1.117,08
Tokyu Land	Japan	FTSE4GOOD	1.071,23
Stockland	Australia	Both	1.064,23
Boston Properties	USA	FTSE4GOOD	1.056,50
Land Securities Group PLC	UK	DJSI World	882,25
Klepierre S.A.	France	DJSI World	880,10
Prologis Trust	USA	Both	855,89
NTT Urban Development	Japan	FTSE4GOOD	793,52
Gecina	France	FTSE4GOOD	647,00
Capital Shopping Centres Group PLC	UK	Both	640,02
British Land Co. PLC	UK	DJSI World	595,19
DTZ Holdings	UK	FTSE4GOOD	407,54
CORIO N.V.	Netherlands	Both	390,80
SEGRO PLC	UK	DJSI World	369,78
Lend Lease Group	Australia	DJSI World	360,62
GPT Group	Australia	DJSI World	341,64
Hammerson PLC	UK	DJSI World	330,59
Grainger	UK	FTSE4GOOD	330,14
CFS Retail Property Trust	Australia	DJSI World	318,02
Unite Group	UK	FTSE4GOOD	298,79
CapitaMall Trust	Singapore	FTSE4GOOD	273,70
Mirvac Group	Australia	FTSE4GOOD	203,30
CapitaCommercial Trust	Singapore	FTSE4GOOD	180,38
Commonwealth Office Property Fund	Australia	Both	174,13
Hysan Development	Hong Kong	Both	150,39
Derwent Valley Holdings	UK	FTSE4GOOD	139,40
Safestore Holdings	UK	FTSE4GOOD	93,47
Dexus Property Group	Australia	Both	77,42

Shaftesbury PLC	UK	DJSI World	74,56
Kiwi Income Property Trust	New Zeland	FTSE4GOOD	63,63
Big Yellow Group	UK	FTSE4GOOD	62,84
F&C Commercial Property Trust	UK	FTSE4GOOD	56,36
Warner Estate Holdings	UK	FTSE4GOOD	45,66
Development Securities	UK	FTSE4GOOD	39,49
Charter Hall	Australia	FTSE4GOOD	35,28
A.& J. Mucklow Group	UK	FTSE4GOOD	19,62

Appendix 2: Inputs to obtain the gross rental income for companies listed in Dow Jones Sustainability Index and FTSE4GOOD in 2010:

Companies	Gross Rental income FY 2009 (m)	Currency	Report Date (FY 2009)	Exchange Rate	Gross Rental Income FY 2009 (m€)
Mitsui Fudosan Co.	529.756,00	JPY	31-Mar	125,93	4.206,75
Simon Property Group	3.755,00	USD	31 Dec	1,4406	2.606,55
Westfield Group	4.047,00	AUD	31 Dec	1,6008	2.528,11
General Growth Properties	3.625,00	USD	31 Dec	1,4406	2.516,31
Realogy	2.886,00	USD	31 Dec	1,4406	2.003,33
Unibail	1.472,90	EUR	-	n.a.	1.472,90
Public Storage	1.627,00	USD	31 Dec	1,4406	1.129,39
Aeon Mall	138.942,00	JPY	20 Feb	124,38	1.117,08
Tokyu Land	134.900,00	JPY	33 Mar	125,93	1.071,23
Stockland	1.847,40	AUD	30-Jun	1,7359	1.064,23
Boston Properties	1.522,00	USD	31 Dec	1,4406	1.056,50
Prologis Trust	1.233,00	USD	31 Dec	1,4406	855,89
NTT Urban Development	99.928,00	JPY	32 Mar	125,93	793,52
Gecina	647,00	EUR	-	n.a.	647,00
Capital Shopping Centres Group PLC	568,40	GBP	31 Dec	0,8881	640,02
DTZ Holdings	364,07	GBP	30 Apr	0,89335	407,54
Corio N.V.	390,80	EUR	-	n.a.	390,80
Grainger	300,20	GBP	30-Set	0,9093	330,14
Unite Group	265,35	GBP	31 Dec	0,8881	298,79
CapitaMall Trust	552,70	SGD	31 Dec	2,0194	273,70

Mirvac Group	352,91	AUD	30-Jun	1,7359	203,30
CapitaCommercial Trust	364,27	SGD	31 Dec	2,0194	180,38
Commonwealth Office Property Fund	302,27	AUD	30-Jun	1,7359	174,13
Hysan Development	1.680,00	HKD	31 Dec	11,1709	150,39
Derwent Valley Holdings	123,80	GBP	31 Dec	0,8881	139,40
Safestore Holdings	84,43	GBP	31 Oct	0,9033	93,47
Dexus Property Group	123,94	AUD	31 Dec	1,6008	77,42
Kiwi Income Property Trust	128,50	NZD	31-Mar	2,0194	63,63
Big Yellow Group	58,49	GBP	31-Mar	0,9308	62,84
F&C Commercial Property Trust	50,06	GBP	31 Dec	0,8881	56,36
Warner Estate Holdings	42,50	GBP	31-Mar	0,9308	45,66
Development Securities	35,07	GBP	31 Dec	0,8881	39,49
Charter Hall	61,25	AUD	30-Jun	1,7359	35,28
A.& J. Mucklow Group	15,90	GBP	30-Jun	0,8104	19,62

Appendix 3: List of the best practices implemented by the ten real estate companies selected in 2006:

#	Practice	Weighing	Category
	British Land Co		
1	To promote efficient use of energy	1	Energy
2	To promote efficient use of water	1	Water
3	Reduce carbon dioxide emissions	1	Energy
4	Increase the attractiveness of buildings to occupiers	1	Water
5	324,000 liters of rainwater were harvested and used for landscaping, cleaning and flushing toilets at Meadowhall	3	Water
6	Manage the costs and risks associated with water use and discharge	1	Water
7	Meet strategic and legal requirements to protect water quality and supply security	1	Water
8	Guidance on water management issues during property acquisition, design, construction, management and refurbishment	1	Water
9	Studies on water needs of the development and on water management measures in place or could be implemented	1	Water
10	Water efficiency measures	1	Water
11	Waterless urinals	2	Water
12	Water restrictors on taps and leak detectors	2	Water
13	Preventing water pollution by providing spill kits	2	Water
14	Training and remediation plans for oil, fuel or chemical spillages on water	2	Water
15	Energy benchmarking tool	2	Energy

16	Plan with improvement recommendations covering management and control of services, lighting, space heating and ventilation	2	Air
17	Work is ongoing to provide monthly energy performance rating results.	1	Energy
18	Project to produce a toolkit to evaluate the energy performance and identify best ways to reduce carbon dioxide emissions	1	Energy
19	Switching electricity supply for common areas from fossil fuels to wind-generated power	2	Energy
20	Installing tri-generation technologies to reduce emissions in heat, power and chilled water for air conditioning.	2	Air
21	Regent's Place Travel Plan led to a reduction in the proportion of cars used	1	SS
22	Twice yearly Transport Forums	1	SS
23	Development of systematic and consistent pedestrian signage and 'step-free' footways	2	SS
24	Purchased six bicycles, helmets and locks for the people who work on site	2	SS
25	The team at Broadgate increased recycling from 40% in 2005 to 46% in 2006	3	Mat
26	Target 20% recycled materials usage on our developments at 201 Bishopsgate and Broadgate	3	Mat
27	Meadowhall Shopping Centre reduced consumption of electricity and gas in 2006 by 11%	3	Mat
28	Facilities to sort, separate and send materials for recycling, including paper, cardboard, plastics and metals.	2	Mat
29	In 2006 92% of waste entering the facility was recycled.	3	Mat
30	Waste management plan	2	Mat
31	Meetings to discuss waste policies and practices	1	Mat
32	Re-using large volumes of clay from pile arising to infill	2	Mat
33	using concrete with recycled aggregate and recycled steel	2	Mat
34	The British Land Biodiversity Program helps us to protect and enhance habitats and species.	1	SS
35	Land Biodiversity Program to promotes the consideration of biodiversity at each stage of the property lifecycle	1	SS
36	We plan, implement and record measures to manage and enhance biodiversity at our properties	1	SS
37	Floating islands were launched to provide roosting and nesting areas for waterfowl	2	SS
38	Green roofs to reduce dust, smog and noise levels, increase the life expectancy of a roof and improve thermal insulation	2	Air
39	Developing the Nature Trail to enhance wildlife habitats and improve links for pedestrians, cyclists and horse-riders	1	SS
40	Plan to identify important habitats and species to restore wildlife to the Centre's landscape	1	SS
	Capital Shopping Center		
1	Program on brownfield land development	1	SS
2	Sustainability a key design factor for all new developments	1	Des
3	Energy from sources exempt from Climate Change Levy	2	Energy
4	5% waste reused through recycling	3	Mat

5	Major progress with public transport initiatives	2	SS
6	Create a new mixed-use development which addresses the sensitivities of the locations	1	SS
7	Focus on incorporating energy efficient solutions into new developments and existing properties	1	Energy
8	Electricity supplies procured from renewable sources	2	Energy
9	Health and safety record continues to be excellent	1	Air
10	Prudent use of natural prudent use of natural resources	2	Mat
11	Reducing the proportion of total waste from our shopping centres consigned to landfill by encouraging more recycling	2	Mat
12	Regeneration of the central areas of cities and towns in which we invest and their vitality	2	SS
13	Shoppings with space for residential apartments	2	Des
14	ISO14001	4	ISO
15	System collecting data of utilities usage, waste, transport and community activities	2	SS
16	Complied with all environmental, health & safety	2	Air
17	Energy consumed is from renewable sources	2	Energy
18	Greywater used for toilets	2	Water
19	33% of waste recycled and waste to landfill reduced	3	Mat
20	Advise us on best practice and suitability	1	Des
21	removal of overhead pylons along the edge of the site	2	SS
22	Re-assess the possibility of introducing on-site wind driven power	1	Energy
23	A centralized biomass boiler plant	2	SS
24	No air conditioning or comfort cooling used - naturally ventilating	2	Air
25	Rainwater harvesting for the flushing of the public toilets, the irrigation of planting and the cleaning of glazing	2	Water
26	green roof is being installed to control run off from the roof	2	Air
27	Mechanical free cooling and underfloor heating	2	Air
28	Variable speed fans to suit air quality requirements	2	Air
29	Energy efficiency limits will be included for lighting	2	Air
30	Low energy lighting fittings	2	Energy
31	Implemented program to monitor water consumption	2	Water
32	Develop Sustrans to ensure sustainable transport choices are provided	2	SS
	Hammerson PLC		
1	To review and update the environmental procedures manual and issue to all UK employees and other key stakeholders	1	Energy
2	Paper based marketing materials produced across the UK portfolio with a view to reducing quantities	2	Mat
3	To switch all UK shopping centre landlord purchased energy due for renewal in 2006 to a green tariff	1	Energy
4	Proportion of waste recycled across UK shopping centers increased to 29%	3	Mat
5	National Energy Foundation’s Energy Efficiency Accreditation Scheme for our offices	2	Energy

6	Proportion of waste recycling across UK shopping centers to 29%	3	Mat
7	Benchmarks for water use across different usages in UK multi-let offices to identify priorities for reducing water use.	2	Water
8	To complete at least 50% of non-conformance energy efficiency best practice actions for environmental audits	1	Energy
9	Gas consumption reduced in 8%	3	Energy
10	Solar panels to power car park lighting, pumps and signage	2	Air
11	Greywater for general maintenance of the retail parks in the UK	2	Water
12	Procedures to monitor air quality key environmental performance data	2	Air
13	Audit construction sites so as to compare the environmental performance	2	SS
14	Design audit to establish a baseline of good environmental practices being achieved	2	Mat
15	Electricity use reduce in 2%	3	Energy
	Stockland		
1	Measure our impact and to improve our energetic performance	1	Energy
2	Adopting best practice sustainability designs and practices	1	Des
3	Conserving resources	1	Mat
4	Reduce greenhouse gas emissions	1	Energy
5	Reduce potable water demand	1	Water
6	Manage stormwater quality and flow	1	Water
7	Reduce waste going to landfill	1	Mat
8	Minimization of ecological impact and optimize ecological benefits	1	SS
9	Promote and provide healthy and comfortable indoor environments	1	Air
10	Encourage the recycling and reuse of materials	1	Mat
11	promote the selection of materials with reduced embodied energy	1	Mat
12	Promote the utilization of more efficient modes of transport	1	SS
13	Management of stormwater volumes and improved water quality returned to natural systems	2	SS
14	enhancing the biodiversity quality of open spaces and adjacent land	1	SS
15	ensure the best trees are retained in public open spaces	2	SS
16	Reducing plastic bag consumption	2	Mat
17	measure the water consumption of an office building	1	Water
18	Tool developed by the NSW Government to set greenhouse gas emissions	2	Energy
19	Tool developed by the NSW Government to lower water consumption	2	Water
20	emerging national thermal comfort tool	1	Air
21	Introduced recycled content paper.	2	Mat
22	Water usage has been tracking 13 per cent below	3	Water
23	Development of a recognised measurement tool for the industry in relation to waste and recycling	2	Mat
24	34 hectares will be redeveloped for residential, commercial and community uses	2	SS
25	Residential comfort index takes into account thermal comfort, air quality, air movement and the	2	Air

26	Use of natural light in dwelling design	2	Air
27	Sunlight and heat and secure crossflow ventilation	2	Air
28	Solar power will help light apartment building common areas and drive a water pumping system to irrigate	2	Water
29	Use of water efficient fittings and appliances	1	Water
30	Recycled water and harvested rainwater	1	Water
31	Innovative grey water treatment and reuse system	1	Water
32	Designs to maximize noise insulation between apartments	2	Des
33	Information to assist them make minimal use of air conditioning and lighting	2	Air
	Lend Lease		
1	Energy: Identify impacts and respond to them through the development and implementation of business planning frameworks	1	Energy
2	Waste: Identify impacts and respond to them through the development and implementation of business planning frameworks	1	Mat
3	Water: Identify impacts and respond to them through the development and implementation of business planning frameworks	1	Water
4	Land use: Identify impacts and respond to them through the development and implementation of business planning frameworks	1	SS
5	Development of a group of statements that articulate the organization's sustainability activity.	2	Energy
6	Commitment to empowered management, operational excellence, people development and enlightened corporate culture	1	Des
7	Best practice design and innovation	1	Des
8	Clear communications; and collaborative partnerships.	1	Des
9	Plans for environmental protection imperatives to ensure track in reporting non financial performance.	2	SS
10	Energy: The Group is working to establish a UN Global Reporting Initiative (GRI) Working Group	1	Energy
11	Waste: The Group is working to establish a UN Global Reporting Initiative (GRI) Working Group	1	Mat
12	Water: The Group is working to establish a UN Global Reporting Initiative (GRI) Working Group	1	Water
13	Products and developments are designed to demonstrate best practice environmental initiatives in design and performance	2	Mat
14	Buildings to be neutral in consumption of energy	1	Energy
15	Buildings to be neutral in consumption of water	1	Water
16	Buildings to be neutral in production of waste	1	Mat
17	Buildings to be best practice examples of indoor environmental quality	1	Air
18	Dedicated time, knowledge and commitment to the development of Green Building Councils	2	Mat
19	Adoption of sustainable building design, construction and operations.	1	Mat
	Land Securities Group PLC		
1	Established a management team which conducted 2,256 surveys across our property management	1	Des
2	CO2 emissions: Participating in the voluntary UK Emissions Trading Scheme and	2	Energy

	beat our reductions target		
3	Participated in a program of energy audits subsidized by the Carbon Trust, and implemented many of the recommendations	1	Energy
4	The use of BREEAM and EcoHome assessments has become standard practice for the Group	1	Des
5	Paper consumption has decreased for the third year running, assisted by the introduction of double sided printers/copiers	2	Mat
6	Recycling: we radically altered the waste management process and have improved the recycling ratio to 70%	3	Mat
7	Recycling levels remain around 50% on the DWP contract after incorporating the JobCentre Plus properties	3	Mat
8	Program to identify locations with potential to enhance the local biodiversity	2	SS
9	Created a team to share ideas and best practice and to discuss new ways of raising awareness of environmental issues	1	Energy
10	Established a group to consider the potential impacts of climate change predictions on our business	2	Energy
11	We buy 30% of energy from renewable sources, against a Government target of 10%.	2	Energy
12	Biodiversity Action Day (BAD) to assess the biodiversity potential of sites	2	SS
13	Installed low-cost equipment such as bird and bat boxes and to carry out planting where possible	2	SS
14	We have fitted water heaters which switch off when there is nobody around	2	Water
15	We have saved water by installing around 2,000 dry urinals across the estate which are cleaned using enzymes	2	Water
16	The Bridges Shopping Centre - All 1,700 light bulbs replaced with low-energy alternatives	2	Air
17	Installed small cisterns and time switches on urinals which cut water use by 30%	2	Water
18	The Bridges Shopping Centre - We replaced 17 cleaning chemicals with three biodegradable products	2	SS
19	The Bridges Shopping Centre - All rubber gloves and bin bags used at the Centre are now biodegradable.	2	Mat
20	We believe that were the only shopping centre in the UK that uses entirely ‘green’ cleaning products	1	Energy
21	Virtually all the shops have signed up with our new waste contractor, who recycles 55% of the Centre’s waste	3	Mat
22	Installed low-energy light bulbs and extended the power management system to the car park	2	Air
23	Sustainable development brochure: details of sustainable suppliers guidelines, which we ask all our major contractors to adopt.	1	Mat
24	Requirements for projects that all timber should be from recognized sustainably managed sources	2	Mat
	GPT Group		
1	GPT’s material areas of focus include: the ecological impact of the built form;	1	SS
2	Ecological Footprint calculator	2	Energy
3	Tidy Town Litter and Waste Management Award	2	Mat
4	Walter Burley Griffin Award for Urban Design	2	Water

5	Jones Lang LaSalle 'Innovation Award' 2006 to Office Portfolio	1	Des
6	Planning and investment so that the time and technologies used will have a long term benefit to investors	1	Energy
7	Leading environmental and social performance goals incorporated into the design process	1	Des
8	14% improvement in energy efficiency per sqm	3	Energy
9	12% reduction in water use per sqm	3	Water
10	Reduce potable water consumption by 10%	3	Water
11	Reduce greenhouse emissions from energy by 5%	3	Energy
12	Generating 17% of all non-potable water consumption on site from rainwater and cooling tower water recycling	3	Water
13	Environmentally sustainable development review process by GPT at the tenancy design stage.	1	Des
14	Developing a useable calculator which assists in identifying the environmental impacts of operational practices	1	Mat
15	The Ecological Footprint Calculator	2	Energy
16	Roll out of flow control taps to all base building and tenant fixtures	2	Water
17	Completion of the National Waste Management strategy roll-out	2	Mat
18	Renewing the mechanical system and upgrade a variety of associated plant equipment	1	Mat
19	Rectifying leaks which were identified through water audits	1	Water
20	Sustainability framework over the course of 2006, setting energy targets	1	energy
21	Sustainability framework over the course of 2006, setting water targets	1	Water
22	Sustainability framework over the course of 2006, setting waste targets	1	Mat
23	Energy efficiency program delivered a 10% saving in energy consumed	3	Energy
24	The Initiative recycles cooling tower water for toilet flushing	2	Water
25	56% of all waste being recycled in 2006	3	Mat
26	Spreading mulch in native landscaped areas, litter removal within sensitive areas, weed mapping and removal.	2	SS
27	Rehabilitate an old landfill area,	2	SS
28	Revegetate sand dunes so as to stabilize beach areas and clean up beaches	2	SS
29	Program by undertaking important water sampling which is then dispatched to laboratories for testing and monitoring.	2	SS
30	Design and the building amenity improved The health and wellbeing	2	Air
31	Cyclist facilities, including accessible change rooms, showers, lockers, and bike racks encourage the reduction of car dependency	2	SS
	Mitsui Fudosan		
1	Environmental Policy for water	1	water
2	Environmental Policy for energy	1	energy
3	Environmental Policy for waste	1	mat
4	Water: preventing pollution, strictly observing environmental laws and setting independent standards	1	water
5	Energy: preventing pollution, strictly observing environmental laws and setting independent standards	1	energy

6	Waste: preventing pollution, strictly observing environmental laws and setting independent standards	1	mat
7	Raises employee awareness of environmental policies through education and other activities, and promotes information disclosure to keep society and local communities informed of our environmental measures and their results.	1	Energy
8	Committee deliberates upon environmental targets and plans sets goals and reports on results	1	Des
9	We include environmental planning from the earliest stages of planning a building	2	Mat
10	Eliminating volatile chemical so that the space inside buildings will not be harmful to the health of users	2	Air
11	Six group companies had obtained ISO 14001 certification.	4	ISO
12	Designing office buildings for long life	1	Mat
13	Increase energy efficiency	1	energy
14	Promote recycling and have energetically implemented recycling systems	2	Mat
15	Worked with outside experts to devise systems to handle various types of waste generated during the course of operations	2	Mat
16	Applies environmental accounting to all buildings it owns and manages	1	Des
17	System to permit automatic, efficient calculation of environmental costs and benefits	2	Des
18	Promote greening land programs in its businesses related to housing, office buildings, and retail	2	SS
19	Eliminate materials that employ formaldehyde and other substances that may pose health issues occupants.	2	Air
20	Adopted the life cycle assessment method to reduce CO2 emissions throughout the lifetime of buildings	2	Energy
21	Cooperates with local communities and society at large in a variety of fields regarding environmental conservation	2	SS
	Shaftesbury		
1	Refurbishes the buildings and obtains changes of use where appropriate	1	Mat
2	Maximising the re-use of existing development land and buildings which consume a lower level of resources	2	SS
3	Use of embodied energy contained within the fabric of existing buildings	2	Mat
4	Extending the useful lives and efficiency of existing buildings rather than demolition and rebuilding.	2	Mat
5	Seeks to extend the useful life of its buildings.	1	Mat
6	Corporate Responsibility Report was prepared by RPS, the Group's external consultant.	1	Des
7	2,48% Waste recycled	3	Mat
8	Monitor and report publicly on its energy performance	1	Energy
9	Collate year-on-year data on their water use	1	Water
10	Use of "green tariff" electricity	2	Energy
11	Improve their management of solid waste	2	Mat
12	Investigate potential improvement of waste management and increased recycling in Chinatown	1	Mat
13	Use of steam cleaning	2	Water

14	Identifying the source of timber used within refurbishment projects identified	1	Mat
15	Analysis expanded and reviewed in line with requirements of the 'Mayor of London Sustainable Design	1	Des
16	promoted strongly, through awareness raising by the Contractors Leaflet and the Environmental Policy	1	SS
17	Measure subcontractors performance on environmental and health & safety Performance.	2	Air
18	Management system and processes designed to protect the environment eith external consultants	1	Des
19	Internal reviews on energy use or waste generation	1	Energy
20	Internal reviews on health and safety performance.	1	Air
21	Monitoring the performance within individual issue areas such as waste management	1	Mat
22	Environmental liabilities analyzed founded previous contaminative uses or the presence of asbestos etc.	1	SS
23	External audits considerating neighbours, cleanliness and environmental awareness	1	SS
	SEGRO		
1	Care with hiuman health hazards and illness	1	Air
2	Conversion of some waste into Fibre Fuel for green energy production	2	Mat
3	Incentives for contractors to reduce waste incorporated as part of tender process	2	Mat
4	Contractors required to provide weekly summary of waste leaving site	2	SS
5	Centralised waste collection systems include recycle and mixed waste bins	2	Mat
6	Increasing land availability for landfill	1	SS
7	Reduce emissions and pollution to air	1	Air
8	Reduce emissions and pollution to water	1	Water
9	Avoid habitat and biodiversity loss	1	SS
10	Regular waste management audits of customer storage facilities and practices	2	Mat
11	Design brief specifications on energy and carbon performance standards	1	Energy
12	Review of energy sources and temperature control	1	Air
13	Eenewable energy explored and onsite renewable energy generation	1	Energy
14	Energy monitoring and targeting programmes	1	Energy
15	Installation of energy efficient technologies	1	Energy
16	Awareness raising with customers	1	Energy
17	Reduce Greenhouse gas emissions	1	Energy
18	Resource depletion (fossil fuels)	1	Energy
19	To review the feasibility and cost of installing renewable energy technologies	1	Energy
20	To calculate the carbon footprint	1	Energy
21	Avoid poor air quality	1	Air
22	Prevention of pollution of watercourses	1	Water
23	Weekly environmental report at development sites	2	SS
24	Monthly environmental site inspection report	2	SS
25	Record environmental incidents on our development construction activities, to	2	Mat

	include, spillages vibration and dust incidents		
26	Car share incentive scheme	2	SS
27	Consideration of public transport infrastructure at planning and design stage of new developments	2	SS
28	Green Travel Plans on selected sites	1	SS
29	Brownfield land development only	2	SS
30	Minimum 5% green space incorporated on new developments	2	SS

Legend:

- Energy – enery and atmosphere
- Air – Indoor environment quality
- SS - Sustainable sites
- Mat - Materials and resources
- Water - Water efficiency
- Des - Innovation in design

Appendix 4: List of the best practices implemented by the ten real estate companies selected in 2009:

#	Practice	Weighing	Category
	British Land Co		
1	Energy use reduced by 2%	3	Energy
2	Low-carbon energy sources	1	Energy
3	Wind turbine on site	2	Energy
4	78% of major retail parks are implementing actions to improve energy efficiency	3	Energy
5	Procured 63% of all electricity across our UK and Continental European portfolio from Climate Change Levy (CCL) exempt sources	3	Energy
6	Purchased carbon credits to help to fund a project that uses waste heat from the production of iron and steel to generate electricity	2	Mat
7	Reduce the waste generated at Head Office per full-time equivalent by 5%	3	Mat
8	72% retail parks implementing actions to improve waste management	3	Mat
9	39% of managed waste from our shopping centres was recycled, with 96% diverted from landfill	3	Mat
10	Developed and published a Fit-out Waste Guide for our office portfolio	2	Mat
11	Water use reduced by 15%	3	Water
12	Implementing actions to improve water efficiency at many of these properties	1	Water
13	Implementing Biodiversity Action Plans	1	SS
14	Developed Green Travel Plans	2	SS
15	Both of our developments in the demolition phase recovered 94% of demolition and strip-out material on average	3	Mat
16	Both of our developments in the construction phase recovered over 80% of construction waste on average	3	Mat
17	Ropemaker used 24% recycled content, Regent's Place One and Two was 25% and	3	Mat

	at One Osnaburgh Street was 23%		
18	Developments in design, demolition or construction are set to have 25% lower carbon emissions than Part L2A Building Regulations	3	Mat
19	Installation of low-energy light bulbs	2	Air
20	fitting daylight sensors to lighting systems	2	Water
21	Water saving devices	1	Water
22	Harvesting rainwater	2	Water
23	Used 6% less water in our annual like-for-like portfolio than last year	3	Water
24	Recycled 59% of waste and incinerated 26%	3	Mat
25	Solar thermal panels	2	Energy
26	Heat water for the management suite	2	Energy
27	Signed an agreement with the Highways Agency that will encourage sustainable transport on developments	2	SS
28	Re-using rainwater and grey water where feasible	2	Water
29	Eliminate water discharge during peak storms, to alleviate local flooding	2	Water
30	Agreement to move journeys away from cars and towards public transport, cycling and walking	2	SS
32	Occupiers benefit from a completed development that offers good accessibility and a pleasant local environment	2	SS
33	Work environmental practices with specialized consultants	2	Des
34	ISO14001	4	ISO
	Capital Shopping Center		
1	Development program is on brownfield land	1	SS
2	Underlining our commitment to the regeneration of our towns and cities	1	SS
3	Development of rezoned agricultural land to support economic growth following the closure of local industries	2	SS
4	Provide Modern retail space, residential accommodation, a new library and public realm improvements	2	Des
5	Environmental Policy and Guide is provided to all consultants and contractors	1	Des
6	Sustainable measures at the design phase	1	Des
7	Water harvesting	2	Water
8	Renewable energy	2	Energy
10	Focus and investment will continue to be very much aimed at minimizing our GHG emissions	1	Energy
11	Purchased 96% electricity for our directly managed shopping centers from Climate Change Levy (CCL) exempt sources	3	Energy
12	shopping centers have been the subject of an energy audit, performed by qualified external consultants	2	Energy
13	5% total electricity consumption reduced	3	Energy
14	Joined a range of property organizations to stimulate shared learning around energy efficiency and related issues	2	Energy
15	monitor energy use and target areas and times of excessive use through effective management control	2	Energy
16	natural ventilation, into our new developments from the outset	2	Air

17	3% decrease in energy consumption	3	Energy
18	We continue to search for additional methods for improving efficiencies in water consumption	1	Water
19	Retrofit water saving devices into existing buildings during refurbishment or re-modeling	1	Water
20	11% decrease in water usage	3	Water
21	Make every effort to improve our management of this area of our business	1	SS
22	53% of wate was recycled, and the remaining	3	Mat
23	17% of waste incinerated with energy recovery	3	Mat
24	30% of waste was sent to landfill	3	Mat
25	Centers facilities achieving a recycling percentage of +40% and a reduction in vehicle movements	3	SS
26	Bespoke advice and guidance on how best to increase further recycling	2	Mat
27	Travel plans for ten of the eleven directly managed shopping centres, working with local authorities and transport operators	1	SS
28	Creation of the car sharing scheme involving various businesses located in the same area	2	SS
29	Shoppers offers alternatives to their cars with prominent links to public transport and cycle information on websites	2	SS
30	New roof area has been landscaped with horticulture designed to maximise the benefit of future bio-diversity in the city	2	Des
31	100% of the resulting rubble reused in the new construction work	3	Mat
32	100% of UK development programme on brownfield land	3	Mat
33	Sustainability remains a key design factor for all new developments	1	Des
	Hammerson PLC		
1	19% energy reduction in 2010	3	Energy
2	Measure carbon footprint including energy and transport emissions	2	Energy
3	Deliver energy diagnostic performance	1	Energy
4	Investigate how people travel to centers	2	SS
5	Research which transport related opportunities and technologies could reduce our environmental impact	2	SS
6	Review implications of opportunities and technologies regarding water efficiency	1	Water
7	Develop a corporate climate change and carbon management policy	1	Energy
8	Investigate the design of car parks and the appropriateness of including adaptable and flexible design components	2	Air
9	Develop an action plan to implement the findings within the existing portfolio on climate change mitigation	2	Energy
10	Increase proportion of waste diverted from landfill through recycling to 75%	3	Mat
11	Develop a program for existing assets to identify opportunities for improvement to biodiversity	1	Mat
12	Investigate the feasibility of offsite logistics centres for recycling activities during both construction and operation phases	2	Mat
13	Undertake an audit of water consumption throughout the managed portfolio	2	Water
14	Develop a plan to reduce consumption	1	Mat

15	Establish sustainability implementation plans for the design and construction of retail parks and refurbishment activities	2	Mat
16	Establish sustainability implementation plans for the design and construction of all new developments	2	Mat
17	Develop a sustainability checklist for all managing agents to reduce energy consumption	2	Energy
18	Monitoring and reporting template for the measurement of energy, water, waste and timber and use it on all construction sites	2	SS
19	Evaluations for all newly completed developments and carry out the evaluations six months after completion	2	SS
20	Initiatives with occupiers: sign 50 Green Leases + distribute Tenants' Requirement Guide to 50 tenants	2	SS
	Stockland		
1	Streamline energy and carbon reporting requirements	1	Energy
2	Eco-efficient refits of existing commercial buildings	1	Energy
3	Minimise our carbon emissions	1	Energy
4	Refine the quality of our emissions reporting system	1	Energy
5	Reduced consumption of electricity in 5%	3	Energy
6	7%reduction in absolute electricity use	3	Energy
7	Greenhouse gas emission intensities (GHG per m2) were reduced by 3 per cent for retail centres and 8 per cent for office buildings	3	Energy
8	Develop a hydraulic flood model and prepare a flood risk management	2	Water
9	Reduce emissions - Prepare a gap analysis to identify/confirm that all data sets are being captured	1	Energy
10	Energy-saving technologies such as lighting controls or variable speed drives on electric motors	2	Air
11	Driving water efficiency and reducing consumption across the lifecycle	1	Water
12	Capacity to positevely shape environmental outcomes	1	SS
13	Tri-generation where a gas-fired generator produces electricity on-site, and the waste heat is used to provide heating and cooling.	2	Air
14	Wind power as a low carbon technology	2	Energy
15	Designing a natural ventilation scheme	2	Air
16	Changing lighting circuits to turn off after trading hours	2	Air
17	Implementation of a standard variable air volume air-conditioning system	2	Air
18	Reduce gas consumption in 17%	3	Energy
19	Reduce water consumption by 5%	3	Water
20	Refine inventory of biodiversity on our land banck and develop a register of threatened and endangered fauna and flora	2	SS
21	Measuring and reducing waste	1	Mat
22	Rree protection and bush regeneration	2	SS
23	Water and ground-water monitoring and protection	2	Water
24	Construction of a practice stormwater treatment system which includes constructed wetlands	2	SS
25	Rehabilitation of all eroded áreas of the site, and preventative works to stop further erosion	2	SS

26	Creation of waterholes and ponds in the open space corridor for native wildlife	2	SS
27	Stormwater harvesting systems will provide the irrigation supply to two hectares of landscape	2	Water
28	Basin taps in toilets were fitted with four litre flow control valves	2	Water
29	Spouts in toiets were fitted with two litre vandal proof aerators in public areas	2	Des
30	Designed swales, bio-retention, household rainwater tanks, and gross pollutant traps	2	Water
31	Completed a national tender for waste management services	1	Mat
32	Measuring and reducing waste	1	Mat
33	Consider aspects such as waste and material selection in the development of new office buildings.	1	Mat
34	Low volatile organic compound paints and carpets	2	Mat
35	low formaldehyde wood	2	Mat
36	Recycled content in structural materials.	2	Mat
37	Introduce recycled waste bins in our shopping centres	2	Mat
38	Activevly managing all waste streams	2	Mat
	Lend Lease		
1	Maximising energy efficiency	1	Energy
2	Reducing greenhouse gas emissions	1	Energy
3	looking after employee wellbeing inside our facilities	1	Air
4	Contribute to communities environment where Lend Lease employees live	1	SS
5	Projects to demonstrate that cities can grow in ways that are ‘climate positive’	2	Energy
6	To reduce the net greenhouse gas emissions of the projects to below zero	1	Energy
7	Implementing economically viable innovations in the buildings	1	Air
8	Generation of clean energy	1	Energy
9	Waste management	1	Mat
10	Water management	1	Water
11	Transportation efficiency	1	Mat
12	Outdoor lighting systems	2	Air
13	Carbon calculator used by the Climate Positive Development program	2	Energy
14	Development of international greenhouse gas emissions reporting	2	Energy
15	Drive deep, fast, low-cost emissions cuts in non-residential buildings	2	Energy
16	Worked with several entities to improve energy efficiency like UNEP or Green Building Council	2	Energy
17	Green building accredited professionals has risen from 5 to 675 in four years	2	Des
	Land Securities Group PLC		
1	6% reduction in energy consumption against the baseline agreed	3	Energy
2	Improving design through focusing particularly on technical solutions for benefits	1	Des
3	Achieve a 5% reduction in CO2 emissions associated with energy use in managed office and retail premises	3	Energy
4	Produced a case study analysis of energy and CO2 performance for the six properties audited in 2007/08	2	Energy

5	Monitor the performance at all occupied premises on rainwater harvesting	2	Water
6	Monitor the performance at all occupied premises of grey-water recycling	2	Water
7	Reduce water consumption Include: audit the incorporation of water-efficient devices and fittings	2	Water
8	FSC-certified wood in one or more specific applications, such as flooring or decking.	2	Mat
9	Reuse or recycle 85% of demolition and construction waste for projects covered by Site Waste Management Plans	3	SS
10	Reused or recycle 85% of office waste generated at Head Office	3	Mat
11	Introduction of food waste incineration for energy	2	Mat
12	Increase recycling rate by an average of 5% across all managed shopping centers	2	Mat
13	Ensure that every shopping centre develops and implements a site-specific air quality environmental management program	2	Air
14	Refine the environmental benchmarking process for managed offices and shopping centers to facilitate meaningful comparisons	2	Des
15	All our projects are aligned with our ISO 14001-certified environmental Management system (EMS)	4	ISO
16	Using sustainably sourced, low-impact materials	1	Mat
17	Some of our buildings use technology that makes the lights go out when there's no one in	2	Air
18	Installing low-energy, motion- triggered lighting	2	Energy
19	Lower their carbon footprint instead	1	Energy
20	Uses natural ventilation, saving around 5 million kWh of energy	3	Air
21	Saving energy on heating and cooling	2	Air
22	Intelligent lighting	2	Air
23	Chilled beam air cooling solution	2	Air
24	Low-flow water fittings	2	Water
25	Green sedum roof to reduce rainwater run-off	2	Water
26	Green sedum roof to absorb CO2 emissions and improve biodiversity	2	SS
27	All our centers already recycle cardboard, wood, plastics and metal.	2	Mat
28	Food waste from the centre's restaurant and coffee shops now goes into biodegradable bags	2	Mat
29	Produce and improve new constructions' soil	1	SS
	GPT Group		
1	Development of ecological footprint calculators	1	Energy
2	Rating greenhouse intensity of assets using recognized schemes such as NABERS	1	Energy
3	Initiating a variety of pilot renewable energy projects	1	Energy
4	Using green leases in retail to reduce energy consumption	2	Energy
5	Evaluating the net financial impact to GPT earnings, development and tenant occupancy costs across a range of carbon pricing	2	Energy
6	Reducing the overall portfolio energy intensity by 24%	3	Energy
7	Reducing emissions intensity by 28%	3	Energy
8	Energy efficiency measures lead to energy reduction of 19%	3	Energy

9	Purchase of GreenPower caused energy consumption to reduce in 9%	3	Energy
10	Regional based structure supported by appropriate technology allows interaction between business locations to occur with limited travel	2	SS
11	Reduced the water used per square meter of space by 33%	3	Water
12	45% water intensity reductions	3	Water
13	87% water recycled used	3	Water
14	Materials with maximizing recycled content and minimizing embodied greenhouse emissions	2	Mat
15	Life cycle assessment techniques are used for major components to provide guidance to design teams	2	Mat
16	Maximize the recycled content of all materials	1	Mat
17	Reduce or eliminate the burden of over-specification of the design	1	Des
18	Constant analysis of materials selection and construction recycling	1	Mat
19	Implemented contract conditions in regard to materials use and construction waste	2	Mat
20	Implemented contract conditions to develop a materials matrix monitoring materials used and recycled content	2	Mat
21	Less 85% of waste from the construction process was recycled	3	Mat
22	All non-structural concrete is 50% recycled	3	Mat
23	100% of the sub-base aggregate used in roads and pavements is 100% recycled	3	SS
24	All timber is sourced from sustainably managed forests	2	SS
25	Reused styrofoam inside planters outside the children's play area	2	SS
26	Plywood with reduced chemical, volatile organic compounds and recycled content	2	Mat
27	Exterior wall finish of Coles with 95% recycled content	3	Air
28	Breathe Easy paints (no VOCs)	2	Air
29	Ceramic wall tiles in lieu energy-intense vitrified alternatives	2	Energy
30	Provided a healthy indoor environment for staff and shoppers	1	Air
31	Enhanced the operating performance of the tenancy, such as noise attenuation, thermal and lighting comfort	1	Air
32	Waste diverted from GPT assets from landfill to recycling has increased to 48%	3	Mat
33	Reduced use of artificial watering - 40% of site area was protected as open space	2	Water
34	Plan for soil erosion, dust, stormwater through construction and vehicle movement	1	Mat
35	Plan to reduce noise at site	1	Air
36	Gross pollutant traps to filter stormwater	2	Water
37	Landing of more than 130,000 trees and plants with 80% being indigenous	2	SS
38	Limiting the size of the rainwater collection tank to maintain the environmental flows	2	Water
39	Garden providing insulation, stormwater management and an extension to green space	2	Water
40	Working with the existing site topography and vegetation to minimize the project's impact	2	SS
41	Using timbers which come from sustainably managed forests rather than Old Growth Forests	2	Mat
42	Educate visitors and staff on the importance of considering what we put down the drain for the benefit of the flora and fauna	2	SS

43	Revegetated the considerably degraded and developed site with local indigenous plantings and landscaping	2	SS
44	National Tree Day and supporting the Chum Creek wildlife shelter	2	SS
	Mitsui Fudosan		
1	Energy conservation equipment	1	Energy
2	High heat insulation and heat shielding performance	1	Air
3	Creation of tools to calculate CO2 emissions	1	Energy
4	Energy conservatipon activities	1	Energy
5	Construction work for reducing Cos emissions	1	Mat
6	Effective use of natural energy	1	Energy
7	Installation of water saving equipment	1	Water
8	Use of rainwater	2	Water
9	Use of recycled wastewater	2	Water
10	Measure to prevent sick building syndrome	1	Mat
11	Checking of soil contamination	1	SS
12	Decreased used of chemicals used through fotocatalists	1	Mat
13	Switching to cleaning agents with lower environmental impact	1	Mat
14	Propoer disposal of CFCs	1	Mat
15	Propoer storage, management and disposal of PCB waste	1	Mat
16	Designs for reduced conservation	1	Des
17	Design for long life buildings	1	Des
18	Floor guide recycled box	1	Mat
19	Restoration and preservation of the habitat environment for living organisms	1	SS
20	Preservation of existing trees and woodland	1	SS
21	ISO14001	4	ISO
22	Forest environmental training was also conducted	2	SS
23	Energy conservation management workshops are also held (eleven times a year)	2	Energy
24	Reduction of greenhouse gas emissions	1	Energy
25	Producing designs that consider energy conservation and the reduction of CO2 emissions based on its eco-specifications	1	Des
26	Energy-conserving air-conditioning systems	2	Energy
27	Cold water thermal storage and ice thermal storage systems	2	Water
28	District heating and cooling and other highly-efficient energy supply systems	2	Air
29	LED lighting in common-use areas	2	Air
30	Fluorescent lamps or incandescent lamps used in common-use areas	2	Energy
31	Rooftop and wall greenery, louver and fin sun shades, air barrier systems	2	Air
32	Three hybrid street lights running on solar power and wind power installed	2	Air
33	Created a tool for forecasting primary energy consumption by modifying the Energy Conservation Center	1	Energy
34	Flush valves and automatic water faucets	2	Water
35	Rainwater and recycled wastewater	2	Water

36	Recycled wastewater made from treated rainwater from the roof, effluent and kitchen	2	Water
37	Wastewater are reused as toilet flushing water	2	Water
38	Concentration of VOC of the indoor air environment is measured at office buildings	1	Air
39	Stamped concrete is a technique to your convervation on the surface by imprinting "stamps" resembling stones, bricks and wood	2	Mat
40	Heed to producing designs that make them easier to renovate	1	Des
41	Highly durable, highly fire-proof and allow easy maintenance are employed in the standard design	2	Mat
42	Tall trees were planted at each house as a "house tree"	2	SS
43	Block of green space featuring a mixture of low, medium	1	MAT
44	Disposable waste increase by around 20%	3	Mat
45	Renovation of heat sourcing and air conditioning	2	Air
	Shaftesbury		
1	Refurbishes the buildings to sustainably extend the useful life of its buildings	1	Mat
2	Re-use of existing development land and buildings which consume a lower level of resources	2	Mat
3	Use of embodied energy contained within the fabric of existing buildings extending its useful lives and efficiency	2	Mat
4	Focus to target significant impacts through its supply chain	1	Mat
5	Corporate Responsibility Report was prepared by external consultants RPS	1	Des
6	Performance against requirements of construction best practices scheme on 83%	3	Mat
7	Ensure findings of energy efficiency from 2008 audit report are implemented at 100% of projects	1	Energy
8	Ensure findings of recycling materials from 2008 audit report are implemented at 100% of projects	1	Mat
9	Investigate high water meter readings at 23 Ganton Street and 1a Earlham Street	1	Water
10	Maintain discussions for identifying residential recycling point within Chinatown	2	Mat
11	Improve biodiversity within existing portfolio through use of bird nesting boxes at appropriate locations	2	SS
12	Ensure that preferred suppliers demonstrate sourcing of a minimum of 50% of other types of timber from a certified sustainable source	3	Mat
13	Certified sustainable source from an FSC certified source	1	Des
14	Achieved a score of 80% of water efficiency measures audited	3	Water
15	Documentation for Subcontractors providing guidance for the specification of materials	2	Mat
16	Documentation for Subcontractors providing guidance for waste management	2	Mat
17	Aim of improving the data collection process regarding waste and recycling	1	Mat
18	Sites audited for good practice against duty of care for waste management and confirmed to be operating satisfactorily	3	SS
19	New construction in process achieved a 'Very Good'	3	Des
20	Continued to monitor energy consumption in the common parts of its portfolio	1	Energy
21	Provision of shared waste facilities to encourage tenants to maximize recycling	2	Mat
22	Controlling the problems of fly tipping and disposal of food and oil waste	2	SS

23	Raise awareness of tenants of energy issues is given to all new tenants	2	Energy
24	Investing only in "brownfield" sites	2	SS
25	Continue to monitor water	2	Water
26	Investigating options within Berwick Street for a central recycling point	2	Mat
27	Improve biodiversity through use of bird nesting boxes at appropriate location	2	SS
	SEGRO		
1	Lighting with energy-efficient alternatives	2	Energy
2	Improving building insulation and installing motion lighting	2	Air
3	Daylight sensors	2	Air
4	Energy intensity reduceed 50%	3	Energy
5	Energy consumption reports on all properties managed	2	Energy
6	Greenhouse gas emissions reports on all properties managed	2	Energy
7	Greenhouse gas emissions reduced 45%	3	Energy
8	Water consumption reports on all properties managed	2	Water
9	Indoor air quality reports on all properties managed	2	Air
10	Use of light industrial units	2	Energy
11	Achieved 36 per cent better energy efficiency	3	Energy
12	Specified energy-efficient design features	1	Energy
13	Use of renewable energy sources	2	Energy
14	Use of ground-source heating and cooling	2	Air
15	Working to apply the relevant national standards regarding energy efficiency	1	energy
16	Instalation of wind turbines	2	Energy
17	Installed photovoltaic roof panels	2	Energy
19	Water-saving feature: Dual-flush toilets	2	Water
20	Water-saving feature: Motion-operated taps	2	Water
21	Water-saving feature: automatic urinals	2	Water
22	Water-saving feature: rainwater harvesting	2	Water
23	Monitoring waste management consistently	1	Mat
24	Reused or recycled 96% of all non-hazardous construction and demolition waste	3	Mat
25	Implementing SiteWaste Management Plans since 2006	2	SS
26	Partnerships with our cladding suppliers to take back waste material and all pallets for reuse, diverting waste from landfill	2	Mat
27	All developments done on brownfield land	2	SS

Legend:

- Energy – enery and atmosphere
- Air – Indoor environment quality
- SS - Sustainable sites
- Mat - Materials and resources
- Water - Water efficiency
- Des - Innovation in design

Appendix 5: Financial indicators of the sustainable group in 2006

Company name	Total equity	Total assets	Net income	ROE	ROI	Report date	Stock Price	Currency
Mitsui Fudosan Co.	963.214,0	3.294.190,0	77.022,0	7,996%	2,338%	Mar 07	1.326,00	JPY
Simon Property Group	735,3	9.560,2	387,8	52,746%	4,057%	Dez 06	1.961,00	USD
Westfield Group	23.629,3	48.881,7	5.636,1	23,852%	11,530%	Dez 06	175.000,00	USD
General Growth Properties	2.194,7	25.241,4	59,3	2,701%	0,235%	Dez 06	137.000,00	USD
Unibail	6.834,2	10.842,9	2.377,0	34,781%	21,922%	Dez 06	68.300,00	EUR
Public Storage	8.208,0	11.198,5	314,0	3,826%	2,804%	Dez 06	518,00	USD
Aeon Mall	60.034,0	223.057,0	12.180,0	20,289%	5,460%	Feb 07	152.500,00	JPY
Tokyu Land	196.283,0	954.074,0	31.364,0	15,979%	3,287%	Feb 07	39.150,00	JPY
Stockland	7.695,0	11.475,7	1.513,8	19,673%	13,191%	Jun 07	79,85	AUD
Boston Properties	3.846,7	9.695,0	873,6	22,711%	9,011%	Dez 06	33,20	USD
Land Securities Group PLC	10.791,3	18.942,9	3.528,3	32,696%	18,626%	Mar 07	526,28	GBP
Klepierre S.A.	2.392,1	6.858,9	194,5	8,130%	2,835%	Dez 0	72,26	EUR
Prologis Trust	6.450,8	15.903,5	874,4	13,554%	5,498%	Dez 06	57,05	USD
NTT Urban Development	125.169,0	581.848,0	12.997,0	10,384%	2,234%	Mar 07	66,14	JPY
Gecina	6.666,0	11.595,3	1.781,4	26,723%	15,363%	Dez 06	26,22	EUR
Capital Shopping Centres	4.732,4	8.750,2	1.564,1	33,051%	17,875%	Dez 06	162,90	GBP
British Land Co. PLC	8.747,0	16.380,0	2.453,0	28,044%	14,976%	Mar 07	7,98	GBP
DTZ Holdings	112,1	287,7	28,7	25,631%	9,989%	Abr 07	40,00	GBP
Corio	3.157,7	5.652,5	640,7	20,290%	11,335%	Dez 0	1.370,00	EUR
SEGRO PLC	3.382,4	6.390,0	919,1	27,173%	14,383%	Dez 06	30,07	GBP
Lend Lease Group	3.243,0	9.336,2	500,2	15,424%	5,358%	Jun 07	219,00	AUD
GPT Group	7.442,1	12.001,9	1.384,0	18,597%	11,532%	Dez 0	537,00	AUD
Hammerson PLC	4.221,7	7.056,5	1.026,8	24,322%	14,551%	Dez 06	7,87	GBP
Grainger plc	250,1	1.509,9	33,5	13,395%	2,219%	Set 06	13,74	GBP
CFS Retail Property Trust	4.545,3	6.375,5	1.112,9	24,485%	17,456%	Dez 06	13,90	AUD
Unite Group	481,2	1.068,3	71,5	14,856%	6,691%	Dez 06	1,24	GBP
CapitaMall Trust	2.975,8	4.811,3	420,4	14,126%	8,737%	Dez 06	516,00	SGD
Mirvac Group	4.080,4	7.352,6	567,4	13,906%	7,717%	Jun 07	176,00	AUD
CapitaCommercial Trust	2.612,4	3.891,8	426,8	16,339%	10,968%	Dez 0	2.890,00	SGD
Hysan Development	32.144	36.411,0	3.688,0	11,473%	10,129%	Dez 0	44,00	HKD

Appendix 6: Financial indicators of the sustainable group in 2009

Company name	Total equity	Total assets	Net income	ROE	ROI	Report date	Stock Price	Currency
Mitsui Fudosan Co.	1.029.226,0	3.710.423,0	61.116,0	5,938%	1,647%	Mar 10	11,61	JPY
Simon Property Group	5.713,3	25.948,3	387,2	6,778%	1,492%	Dez 09	79,80	USD
Westfield Group	24.306,9	47.165,6	-450,1	-1,851%	-0,954%	Dez 09	12,54	USD
General Growth Properties	1.054,2	28.149,8	-1.304,8	-123,777%	-4,635%	Dez 09	9,00	USD
Unibail	12.435,6	22.680,3	-1.566,5	-12,596%	-6,906%	Dez 09	153,70	EUR
Public Storage	9.074,5	9.805,6	834,6	9,197%	8,511%	Dez 09	23,68	USD
Aeon Mall	158.816,0	503.546,0	21.809,0	13,732%	4,331%	Feb 10	19,85	JPY
Tokyu Land	230.986,0	1.055.364,0	11.058,0	4,787%	1,047%	Feb 10	2,53	JPY
Stockland	8.395,9	12.274,9	382,3	4,553%	3,114%	Jun 10	3,95	AUD
Boston Properties	5.124,7	12.348,7	274,5	5,356%	2,222%	Dez 09	67,07	USD
Land Securities Group	5.689,0	9.722,9	1.092,4	19,202%	11,235%	Mar 10	685,00	GBP
Klepierre S.A.	2.670,9	7.729,7	396,1	14,830%	5,124%	Dez 09	27,72	EUR
Prologis Trust	8.007,3	16.885,4	23,9	0,298%	0,141%	Dez 09	13,69	USD
NTT Urban Development	185.538,0	916.725,0	7.451,0	4,015%	0,812%	Mar 10	459,14	JPY
Gecina	3.686,2	7.917,4	-160,1	-4,342%	-2,021%	Dez 09	76,14	EUR
Capital Shopping Centres	2.421,1	7.048,3	-370,1	-15,286%	-5,250%	Dez 09	515,00	GBP
British Land Co. PLC	2.190,0	6.398,0	1.140,0	52,054%	17,818%	Mar 10	480,00	GBP
DTZ Holdings	59.904,0	318.805,0	-23.439,0	-39,127%	-7,352%	Apr 10	65,75	GBP
Corio	3.384,1	4.652,9	-194,0	-5,732%	-4,169%	Dez 09	43,25	EUR
SEGRO PLC	2.593,2	5.519,3	-233,1	-8,988%	-4,223%	Dez 09	4.425,00	GBP
Lend Lease Group	3.389,0	11.371,1	348,2	10,274%	3,062%	Jun-10	10,27	AUD
GPT Group	6.668,4	9.163,4	-1.070,6	-16,054%	-11,683%	Dez 09	0,61	AUD
Hammerson PLC	3.023,1	5.666,4	-350,4	-11,590%	-6,183%	Dez 09	424,00	GBP
Grainger	128,5	1.949,2	-122,0	-94,941%	-6,259%	Set 09	128,00	GBP
CFS Retail Property Trust	5.061,0	7.700,6	315,0	6,224%	4,090%	Jun 10	1,90	AUD
Unite Group	381,05	921,9	-34,4	-9,040%	-3,736%	Dez 09	3,09	GBP
CapitaMall Trust	4.969,61	7.423,0	-65,2	-1,311%	-0,878%	Dez 09	1,80	SGD
Mirvac Group	5.455,4	7.887,5	237,4	4,351%	3,009%	Jun 10	1,57	AUD
CapitaCommercial Trust	3.956,4	6.099,0	-839,2	-21,210%	-13,757%	Dez 09	0,98	SGD
Hysan Development	38.732,0	44.042,0	3.044,0	7,859%	6,911%	Dez 09	22,05	HKD

Appendix 7: Financial indicators of the non sustainable group in 2006

Company name	Total equity	Total assets	Net income	ROE	ROI	Stock Price	Currency
Tokyo Tatemono Co Ltd	24.870,0	36.471,0	1.388,0	5,581%	3,806%	1.326,00	JPY
Touei Housing Corp	39.397,0	113.089,0	2.568,0	6,518%	2,271%	1.961,00	JPY
Sanyo Housing Nagoya	10.380,0	26.736,0	1.479,0	14,249%	5,532%	175.000,00	JPY
Tosei Corp	15.229,7	60.136,5	2.737,1	17,972%	4,552%	137.000,00	JPY
Suncity Co Ltd	20.585,0	60.945,0	2.607,0	12,665%	4,278%	68.300,00	JPY
Tokyo Rakutenchi Co	24.870,0	36.471,0	1.388,0	5,581%	3,806%	518,00	JPY
Land Business Co	1.223,2	14.411,3	116,5	9,522%	0,808%	152.500,00	JPY
ARDEPRO Co Ltd	10.835,0	33.130,0	3.738,0	34,499%	11,283%	39.150,00	JPY
Swan Mills Ltd	339,5	2.680,3	12,7	3,735%	0,473%	79,85	INR
CB Richard Ellis Group Inc	1.259,8	5.944,6	318,6	25,288%	5,359%	33,20	USD
Marathon Nextgen Realty	992,3	1.879,4	452,7	45,627%	24,090%	526,28	INR
Lancor Holding Ltd	172,1	1.496,3	3,9	2,284%	0,263%	72,26	INR
Nirlon Ltd	1.237,5	2.448,5	13,2	1,067%	0,540%	57,05	INR
Ashiana Housing Ltd	323,4	1.386,1	94,5	29,211%	6,816%	66,14	INR
Brookfield Properties Corp	5.657,0	19.314,0	135,0	2,386%	0,699%	26,22	USD
Ansal Buildwell Ltd	258,5	3.092,6	65,1	25,194%	2,106%	162,90	INR
Alchemist Realty Ltd	219,7	245,6	2,9	1,334%	1,193%	7,98	INR
MPG Office Trust Inc	460,6	3.511,7	93,2	20,242%	2,655%	40,00	USD
Songbird Estates PLC	2.379,0	7.462,0	15,3	0,643%	0,205%	1.370,00	GDP
WP Carey and Co LLC	639,8	1.093,0	85,6	13,376%	7,829%	30,07	USD
LSL Property Services	26,0	110,6	13,4	51,521%	12,098%	219,00	GDP
The Unite Group PLC	481,2	1.068,3	71,5	14,855%	6,691%	537,00	GDP
American Realty Investors	238,7	1.493,7	0,3	0,142%	0,023%	7,87	USD
Associated Estates Realty	113,9	648,8	-25,5	-22,423%	-3,936%	13,74	USD
Transcontinental Realty Investors	282,1	1.250,2	1,5	0,546%	0,123%	13,90	USD
Treveria Plc	773,0	2.078,1	56,2	7,266%	2,703%	1,24	EUR
St Modwen Properties PLC	389,8	953,4	75,9	19,472%	7,961%	516,00	GDP
Mwb Business Exchange PLC	11,1	47,5	7,6	68,987%	16,067%	176,00	GDP
Daejan Holdings PLC	861,9	1.302,4	141,8	16,456%	10,890%	2.890,00	GDP
Asian Growth Properties Ltd	6.478,1	9.405,0	16,8	0,259%	0,178%	44,00	GDP

Appendix 8: Financial indicators of the non sustainable group in 2009

Company name	Total equity	Total assets	Net income	ROE	ROI	Stock Price	Currency
Tokyo Tatemono Co Ltd	25.460,0	35.109,0	814,0	3,197%	2,318%	356,00	JPY
Touei Housing Corp	27.360,0	60.627,0	3,4	0,012%	0,006%	775,00	JPY
Sanyo Housing Nagoya	14.676,0	30.526,0	723,0	4,926%	2,368%	77.900,00	JPY
Tosei Corp	22.253,7	62.235,1	108.249,0	0,486%	0,174%	19.300,00	JPY
Suncity Co Ltd	519,0	40.499,0	-6.443,0	-1241,426%	-15,909%	2.240,00	JPY
Tokyo Rakutenchi Co	25.640,0	35.109,0	814,0	3,175%	2,318%	382,00	JPY
Land Business Co	1.017,5	17.155,3	47.520,0	4,670%	0,277%	17.800,00	JPY
ARDEPRO Co Ltd	-19.599,0	32.705,0	-25.618,0	130,711%	-78,331%	442,00	JPY
Swan Mills Ltd	1.231,8	7.220,9	389,0	31,582%	5,387%	175,90	INR
CB Richard Ellis Group Inc	784,3	5.039,4	-27,6	-3,524%	-0,548%	13,57	USD
Marathon Nextgen Realty	3.092,2	4.489,9	1.492,1	48,255%	33,233%	240,23	INR
Lancor Holding Ltd	636,0	1.660,5	182,0	28,619%	10,962%	106,80	INR
Nirlon Ltd	1.221,8	7.884,6	-183,4	-15,010%	-2,326%	59,70	INR
Ashiana Housing Ltd	1.297,9	1.986,4	367,7	28,331%	18,511%	115,65	INR
Brookfield Properties Corp	7.188,0	20.570,0	317,0	4,410%	1,541%	12,12	USD
Ansal Buildwell Ltd	480,8	3.661,6	104,3	21,685%	2,848%	85,10	INR
Alchemist Realty Ltd	287,8	2.338,6	14,1	4,899%	0,603%	14,35	INR
MPG Office Trust Inc	-857,0	3.667,7	-370,7	43,252%	-10,106%	1,51	USD
Songbird Estates PLC	1.191,6	6.172,0	202,4	16,986%	3,279%	156,00	GDP
WP Carey and Co LLC	640,1	1.093,3	65,4	10,209%	5,977%	27,68	USD
LSL Property Services	45,9	117,0	11,8	25,621%	10,040%	258,00	GDP
The Unite Group PLC	381,1	921,9	-34,5	-9,041%	-3,737%	289,00	GDP
American Realty Investors	211,3	1.806,1	-86,6	-40,986%	-4,796%	12,25	USD
Associated Estates Realty	101,3	662,5	-9,7	-9,578%	-1,464%	11,27	USD
Transcontinental Realty Investors	245,4	1.608,3	-79,0	-32,177%	-4,910%	11,91	USD
Treveria Plc	176,7	2.034,6	-166,5	-94,227%	-8,182%	0,11	EUR
St Modwen Properties PLC	401,0	1.061,8	-101,7	-25,362%	-9,578%	180,00	GDP
Mwb Business Exchange PLC	27,9	91,3	4,2	15,065%	4,599%	75,00	GDP
Daejan Holdings PLC	785,1	1.229,7	45,7	5,816%	3,713%	2.800,00	GDP
Asian Growth Properties Ltd	8.053,2	11.736,8	1.202,8	14,936%	10,248%	25,00	GDP