Investment Decisions on the Sustainable Refurbishment of Existing Commercial Properties in Sweden

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Abstract

Aim - The aim of this paper is to contribute to the current knowledge of sustainable refurbishment by looking into how commercial property owners in Sweden make decisions on refurbishing their existing commercial properties into more sustainable ones.

Methodology - This aim is reached through investigating current market thinking and practices on investing in sustainable refurbishment; identifying key factors that are affecting project profitability and studying how they are reflected in the investment calculations; as well as conducting sensitivity analyses on the identified key factors. The study is mainly based on empirical research of face-to-face interviews with representatives from 9 of Sweden's leading commercial property owners. The results were analyzed both statistically and thematically. Relationships between the interviewees' responses and the categories that the subject companies were grouped into were been identified and discussed. In the end, key factors considered as affecting the profitability of sustainable refurbishment were incorporated into modeling the sensitivities of the increased rental income and return of a hypothetical commercial building to these factors.

Key findings - Overall, according to this research, the Swedish property owners exhibit a very embracing attitude towards the sustainable building trend and investing in sustainable refurbishment is seen as buying an insurance to future-proof their properties. It is believed that the investment performance of sustainable buildings would be better than the traditional ones within 10 years, and as long as the right measures are taken, high profit and sustainability could come hand in hand. As for the initiatives, engaging in sustainable refurbishment is more of a company strategic issue. Regarding the payback time, more than half show a level of tolerance that is a little higher than the strictly profitable limit. The lower
operating cost of sustainable buildings is most often reflected in the investment calculations, while the higher marketability feature is a factor that is affecting the investment decisions to the largest extend. Higher rent can not be charged at the moment but this might happen if the combination of increased fixed rent and decreased variable rent results in a lower total rent. The sensitivity analyses show that the potential increase in rental income would not actually be very significant and that project return is most sensitive to changes in occupancy ratio and rent. When it comes to the classification systems, LEED is ranked as the most highly regarded one, followed by EU Greenbuilding and BREEAM.

**Research implications** - This research could open up a new research area in the study of sustainable buildings, advance debates on the issue and provide useful insights for further research.

**Practical implications** - The findings of this research could be of practical use to commercial property owners in their refurbishment projects through providing them with a big picture of the current market thinking/practices, sharing relevant experiences from market practitioners and pointing out the areas that are worth noting in the investment calculations.

**Originality/value** - The study of sustainable buildings is a rather new field. Most of the existing research is directed towards new build properties and is focused on the housing sector. This research is a first attempt to study the sustainable refurbishment of existing properties with focus on the commercial sector in Sweden.
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1. Introduction

1.1 Background and aim

Given the worrying environmental problems the entire world is facing today, a substantial contribution that the property sector can make to both the industry and the world is to incorporate environmental responsible practices in buildings (Roper & Beard, 2006). The reason lies in the fact that the current operations of the building industry exert one of the biggest threats to our sustainable future. For example, the building sector is responsible for around 40% of the energy and material consumptions and a large amount of excessive wastes in Europe (Sand, 2003).

With great challenges comes great potential for changes. According to Lorenz & Lützkendorf, the property and construction sector plays a bigger role in contributing to sustainable development than any other sector (Lorenz & Lützkendorf, 2008) The sector is therefore referred to as the “cornerstone of sustainability” (OECD, 2003). Better still, according to the Inter-Governmental Panel on Climate Change, the building sector possesses the greatest potential in reducing greenhouse gas emissions, while at the same time maintaining economic growth. From reducing energy use in buildings, CO₂ emissions can be lowered by as much as 29% at no net cost by 2020 (IPCC, 2007).

The property sector is also increasingly aware of the importance of actively responding to the sustainable trend so as to future proof their investments. The first and foremost effort is to construct sustainable buildings, either through incorporating sustainability in their new building projects or upgrading the sustainability performance of the existing buildings. The latter is worth extra attention because the annual addition of new buildings is minimal, especially in developed countries where new buildings constructed every year only add up to 1.5-2% of the existing stock (Bullen, 2007). The new buildings' impact on the environment is therefore rather limited (Pearce, 2004), while the real impact comes from the existing stock which will stay with us for decades to come (Kohler & Hassler, 2002). According to the Organization for Economic Cooperation and Development, the existing stock represents an untapped and huge resource to improve the environment (OECD, 2004). It is also the most critical aspect in the issue of sustainable buildings (Cooper, 2001). If the sustainability issue in the property and construction sector is to be seriously addressed, major efforts need to be put on the existing stock (Steemers, 2003).

This paper aims to contribute to the current knowledge of sustainable refurbishment by looking into how commercial property owners in Sweden make decisions on refurbishing their existing commercial properties into more sustainable ones. The research objectives include: 1,
Investigate current market thinking and practices for investing in sustainable refurbishment; 2, identify key factors that are considered to be affecting project profitability and study how they are reflected in the investment calculations; 3, conduct sensitivity analyses on the identified key factors.

Current research is mostly directed towards new build properties, while the real potential of sustainable buildings lies in the existing stock. Besides, most of the research nowadays is focused on the refurbishment of residential buildings, which leaves an interesting gap for studying the commercial sector. With one of the main drivers of sustainable refurbishment being property owners and tenants’ desires for "green" corporate images, the commercial sector is also more relevant. Combining the two aspects, the existing stock and the commercial sector, makes investment decisions on the sustainable refurbishment of existing commercial properties a research topic that is well worth studying.

The remaining parts of this paper are organized as follows: definitions that are referred to can be found in the rest of chapter 1, while chapter 2 introduces the methodology used. Chapter 3 reviews the main issues on sustainable buildings and refurbishment in details. Results and discussions of the empirical studies as well as the sensitivity analyses are presented from chapter 4 to 8. The paper is then concluded in chapter 9.

1.2 Definitions
In this research, sustainable buildings are defined as buildings that have low environmental impact throughout their life-cycles in the design, construction and operation processes, while at the same time offer a high level of comfort and well-being for occupants. Traditional buildings refer to buildings that comply with legal requirements but show no superior sustainability. Sustainable refurbishment is broadly defined as any building work beyond daily maintenance that improves the sustainability of buildings, such as reducing energy consumption. Commercial properties that are studied in this research are office buildings and retail properties, including stores and shopping centers in Sweden.
2. Methodology

The study is mainly based on empirical research of face-to-face interviews with representatives from 9 of Sweden's leading commercial property owners, including some of the biggest players in the market.

To start with, an extensive literature review was conducted to find out the current market opinions and practices on sustainable buildings in general and more specifically sustainable refurbishment. This helped to set a background for the research and provide necessary knowledge to design the interview questions.

The interviews were carried out in meeting rooms at the offices of the interviewed property owners in Stockholm and Västerås during December 2009 and January 2010. The aim of the interviews was to obtain current views from property owners about the key issues on sustainable refurbishment of existing commercial properties in Sweden, with focus on their decision-makings.

The subject companies were selected based on the concentrations of their property portfolios and the portfolio sizes in terms of total areas. All of them own mainly commercial properties, with 2 companies focusing on office buildings, 3 on retail properties and 4 on both. This helped to ensure that balanced materials on both office buildings and retail properties were collected. The total commercial area of the properties range from approximately 240 000 m² to 2 215 000 m². The biggest market players were chosen so that the information collected could represent the market opinions as closely as possible. All of the companies have their main operations in the biggest cities in Sweden, such as Stockholm, Gothenburg, Malmö and Uppsala. 78% of the interviewees were specially responsible for environmental affairs in their companies, taking positions such as environmental manager (miljöchef/miljöansvarig) and 89% of them have worked in the companies for more than 2 years. Therefore, they should be considered very knowledgeable about the sustainability issues within their companies.

The interviews were conducted in a semi-structured and one-on-one manner and lasted on average 45 minutes. An interview guide with 13 open and closed questions grouped in a few specific topics (as shown in Appendix 1) were prepared as a rough guideline to follow during the interviews. The following areas were covered by the questions: opinions on the sustainable building trend, experience with sustainable refurbishment, initiatives for sustainable refurbishment, investment criteria/calculations used, key variables considered, level of sustainability aimed, execution of the projects and the main difficulties/barriers. Questions were not exactly asked in the
same order as outlined in the interview guide but the same wordings were used every time. Occasionally things said by the interviewees were picked up and follow-up questions were asked based on them. Overall, the interviewees were given great flexibility in answering the questions and in elaborating their answers.

The interviews were conducted in English with some terms explained in Swedish. No voice recorder was used and instead notes were taken by hand during the interviews. This was to make sure the interviewees felt as comfortable and at ease as possible when answering the questions. Soon after the interviews the responses were summarized and sent back to the interviewees to make sure that everything has been understood correctly.

The results were then analyzed both in a statistical approach using Open Office Spreadsheet and in a thematic approach to identify categories, themes and patterns. Subject companies were also categorized based on their forms of ownership, sizes and dedication levels to environmental work. Relationships between the categories and their responses were then identified and discussed.

After this, key factors seen as affecting the profitability of sustainable refurbishment were incorporated into modeling the sensitivities of the increased rental income and return (IRR) of a hypothetical commercial building with 20,000 m² rentable area to these factors.
3. Sustainable buildings and refurbishment – The main issues

3.1 Sustainable property investment

Sustainable property investment has grown in recent years with the popularity of adopting corporate social responsibility (CSR) practices. Around the globe, it is attracting a growing attention of property investors that are hoping to minimize the risks and improve the financial performance of their investments. The correlation between good corporate sustainability practices and superior financial returns has been shown by Murphy's extensive study (Murphy, 2002).

This phenomenon is partly driven by the property owners' need to actively communicate their contribution to sustainable development to the tenants, who in turn need to demonstrate their "green" efforts to their customers and employees by locating in sustainable premises. Services such as the "Dow Jones Sustainability Index" have also made it easier for market participants to gain information on the sustainable practices of corporations (Lützkendorf & Lorenz, 2005).

3.2 Sustainable buildings

In the last decade, there have been growing international interests and discussions from the governments, the property sector, investors and the general public about sustainable buildings and their huge potential to contribute to our sustainable future (Miller & Buys, 2008).

3.2.1 Defining sustainable buildings

A first question that we will have to clarify when approaching the issue of sustainable buildings is what kind of buildings are considered sustainable? Similar as the definition of sustainable development, there exist a handful of definitions for sustainable buildings as well. Moreover, a few different notions with the same sentiments, such as green buildings and sustainable real estate, have also been widely used in the literature.

Sustainable buildings can be defined as buildings that have low environmental impact throughout their life-cycles in the design, construction and operation processes (Light House, 2009) and as buildings that offer a high level of comfort and well-being for occupants (Miller & Buys, 2008).

In practice, several widely recognized property classification systems are used to assess the levels of sustainability of buildings. Among them are the EU GreenBuilding Program (measuring improved energy efficiency for non-residential buildings) (EU Greenbuilding, 2009); the BREEAM
(BRE Environmental Assessment Method, established in the UK, currently the leading and most widely used standard) (BRE, 2009); the LEED (Leadership in Energy and Environmental Design, originated from the US, also internationally recognized) (USGBC, 2010) and the Green Star system (used in Australia) (Fowler & Rauch, 2006). These systems serve not only as a benchmark for the performance of the designs, constructions and operations of sustainable buildings (USGBC, 2010), but also as a recognition that the best environmental practices have been applied to these buildings (BRE, 2009). More importantly, the systems have made it easier for market participants to communicate their sustainability efforts to the intended parties.

However, most of the classification systems have not yet covered the needs for life cycle assessment and life cycle costing, and are still under continuous improvements (Lorenz & Lützkendorf, 2008). Moreover, they have been developed relatively independent from each other without proper coordination (Lützkendorf &Lorenz, 2005). The lack of one common standard can be seen as positive as it fosters competition and ensures the quality of the systems, while one can also say that this has made it more difficult to demonstrate sustainability efforts to the intended parties, discouraging such efforts and eventually hindering the development of sustainable buildings. Some property owners have decided not to be certificated by any classification system simply because it does not pay for itself, while some have chosen to go through the certification process sooner since the standards are constantly under change and it will probably be more difficult to get certified in the future. It can also be a frustrating experience if a building has been built aiming for a certain rating but the standard changes right when the building is being evaluated.

### 3.2.2 Benefits of sustainable buildings

Another key aspect in approaching the issue of sustainable buildings is to understand in what ways are they better than their traditional counterparts and how do market participants perceive these benefits.

#### 3.2.2.1 Benefits for the environment

Through reviewing the Green Star Certified buildings, the Green Building Council of Australia estimates that a 85% decrease in energy use, a 60% decrease in potable water consumption and a 69% decrease in construction waste could be achieved with them (Green Building Council of Australia, 2008). This gives a good picture of the huge environmental benefits of sustainable buildings.
3.2.2.2 Benefits for tenants and tenant demand

The appeal of sustainable buildings for tenants lies in their potential economic and social benefits, with the most prominent and well recognized economic benefit being the lower operating costs. Efforts to quantify the saving still undergo, among them is a study by David Gottfried. It was estimated that the energy consumption of sustainable buildings could be lowered by 30 to 50% while water usage could be reduced by 30% or more (Gottfried, 2003). Another study by the U.S. Green Building Council found that energy and water costs could be lowered by more than half in sustainable buildings (Garzone, 2006). More intangible but still widely appreciated by companies is the "green" corporate images created through locating in sustainable premises which when communicated properly could benefit their business in all areas.

The social benefits that come with sustainable buildings include among others, 6-16% higher productivity (Lützkendorf &Lorenz, 2005), lower absenteeism (Kumar & Fisk, 2002; Heerwagen, 2002), 15% lower turnover (Leaman & Bordass, 1999), as well as higher retail sales and easier space reconfiguration (Miller, et al., 2008). Some believe that sustainable office buildings can attract the best young talents of the generation with high environmental awareness (Green Building Council of Australia, 2008). In recent years, tenants have also started to appreciate the improved comfort and health brought by sustainable buildings such as cleaner air and more natural lighting.

However, given the many benefits of sustainable buildings, are tenants willing to pay higher rent for them? At present the general opinion is - No, not yet. Although tenants are less skeptical about the potential benefits of sustainable buildings now, they still need to see solid proofs of the economic benefits before they are willing to share the costs (Miller, et al., 2008). The currently available market transaction data on sustainable buildings is also not sufficient enough to show a clear trend in rent difference (Lützkendorf &Lorenz, 2005). On the other hand, non-sustainable office buildings are already out of the consideration of some larger tenants, while smaller tenants are planning to pay less for them (Miller & Buys, 2008). In recent years, “non-sustainability discount” is likely to be more prominent than “sustainability premium” (LaSalle, 2006) and a two-tier market might be formed (Green Building Council of Australia, 2008). At places where rent differences are not observed, a faster absorption of sustainable buildings is present (Miller, et al., 2008). It is easily foreseeable that the demand for sustainable buildings will rise prominently (Lützkendorf & Lorenz, 2005).

3.2.2.3 Benefits for property owners and cost analysis

For property owners, the appeal of sustainable buildings comes primarily from increasing tenant demand. Being sustainable distinguishes these commercial buildings from their non-sustainable
counterparts and therefore enlarges their potential markets. For example, one of the main tenants, the governments, are among the strongest initiatives to promote sustainable buildings and they usually have set minimum sustainability criteria for their leasing. Private market-based companies are equally, if not more, keen on selecting their premises based on how sustainable the buildings are (Miller, et al., 2008). A series of economic benefits can thus be delivered: higher building value (7.5%), Return on Investment (6.6%), occupancy ratio (3.5%) (Green building council of Australia, 2008), and higher marketability (Yates, 2001). Increasingly, companies invest in sustainable buildings also because of the intangible factors, such as better perceived CSR (Corporate Social Responsibility) practices (Reed, 2007).

Besides looking at the direct economic gains, the benefits of sustainable buildings can also be approached through the reduced property risk dimension. For example, energy and water savings reduce the risk of rising energy and water prices in the future, which otherwise can cause huge uncertainties in the economic performance of properties. Fulfilling environmental standards higher than stipulated by the law reduces the risk of tightening legislations and policies in the future (Lorenz & Lützkendorf, 2008). This is why many property owners describe sustainable buildings as "future-proof" investment. Actually, in some cases the banking system has already realized these by offering easier lending conditions for sustainable buildings (Lorenz, 2006).

Another main question raised by the property owners would be: Are sustainable buildings worth it? According to a research by the U.S. Green Building Council, a LEED certified building costs on average only 0.66% higher than a traditional one (Green building council of Australia, 2008). Surprisingly, many newly started buildings can actually be turned into sustainable ones without extra cost (Matthiessen & Morris, 2004). A cost-benefit analysis conducted by Kats and Kats et al. proved that an increase of 2% in sustainable design would save on average 20% of the total construction cost over the life cycle of the building; and overall, savings from sustainable building were significantly higher than any extra upfront costs (Kats, 2003; Kats et al., 2003). From the evidence above, it can be seen that sustainable buildings do pay off.

3.2.3 Factors hampering sustainable buildings

One factor that may hinder the development of sustainable buildings is that tenants get to enjoy most of the expected benefits associated with sustainable buildings but are not willing to pay higher rent to compensate the property owners for their initial investments. This situation can seriously discourage those property owners without so much financial flexibility from investing in sustainable buildings (Miller, et al., 2008). Risks may also arise if property owners make over-ambitious goals, apply unreliable and experimental technical methods, or when the market perceptions are lagging
the expectations of property owners to a too great extent (Lorenz & Lützkendorf, 2008).

3.3 Sustainable refurbishment

3.3.1 Defining sustainable refurbishment

Again, to start with, we need to determine what sustainable refurbishment refers to. A few different related terms, such as adaptive re-use and retrofitting, have been widely used in the literature. A sustainable refurbishment program can imply adapting an obsolete building to a new use, thus improving its sustainability (Lowe, 2004). It can also mean upgrading the performance of an existing property to meet new requirements (Iselin & Lemer, 1993) and reducing its environmental impact.

In both senses, sustainable refurbishment can be seen as building works that are carried out beyond daily maintenance and can prolong the economic life of the otherwise obsolete buildings in economically, socially and environmentally desirable ways (Mansfield, 2009).

3.3.2 Advantages of sustainable refurbishment

The existing stock represents precious economic, social and environmental capital (Myers & Wyatt, 2004).

Economically, it is commonly believed that it is cheaper to refurbish old buildings than to demolish and build new (Department of Environment and Heritage, 2005), with major savings coming from land acquisition and construction costs (Bullen, 2007). Another economic advantage is that construction periods can be shortened (Highfield, 2000) and thus disruption to normal business operations can be minimized. This is particularly relevant for retail properties. Older buildings usually have higher plot ratios which can be utilized to the favor of property owners in refurbishment (Highfield, 2000). In addition, older buildings usually occupy the best locations in well-developed cities (Ball, 2002). It would be a waste not to make good use of the locational advantages of existing buildings through refurbishment.

Socially, older buildings can be valuable and non-renewable aesthetic and cultural resources. They are seen as a media to hold the collective identities and memories of the local communities. Therefore, the public is usually highly in support of retaining existing buildings; while demolishing is facing more and more resistance from the local communities (Mansfield, 2009). In developed countries, there is a growing public demand to restrict new building constructions (Graham, 2003) and even to stop building new completely (Kohler, 1999). Refurbishment, on the other hand, can
bring dynamics to the existing communities and ease urban sprawl (Bullen, 2007).

Environmentally, refurbishment is in itself more sustainable than building new because it adopts the concept of “reuse”. Less energy/material are consumed and less pollution/emissions are released during the process (Bullen, 2007); while demolition is at least a waste of materials (Department of the Environment and Heritage, 2005). Furthermore, some characteristics of older buildings, including modest plan depths, high thermal mass, high ceilings and narrow windows all make them very desirable materials to build on in the environmental sense (Steemers, 2003).

3.3.3 Disadvantages of sustainable refurbishment

On the other hand, it is inherently rather difficult for refurbished buildings to reach the environmental performance of new buildings, meet the current sustainability criteria or satisfy new market demands (Mansfield, 2009). Some even argue that in order to meet the current sustainable criteria, all older buildings have to be replaced by new ones eventually (Bullen, 2007).

Another issue with sustainable refurbishment, compared with building new, is that existing tenants, especially in multi-tenant commercial buildings, have a very big saying in the process, since their business operations will be very much disrupted. Tenants can get tired of the long process, asking for clear refurbishment plans that detail the costs, benefits and timelines. Their active participation, close cooperation and firm support are a must if the refurbishment is to be carried out smoothly (Miller & Buys, 2008). Balancing the benefits and attending to the needs of many different tenants can be a very challenging task for the property owners. If not done properly, existing tenants can be lost.

3.4 Sustainable buildings in Sweden

3.4.1 Brief history

With her capital being awarded the European Green Capital for 2010, Sweden has long been on the frontier of sustainable development. In 1998, the government started the “Bygga-bo-dialogen” to initiate discussions and commitment from the participating parties (the government, the local authorities and the industry) to work on bringing the building sector into a sustainable future (Bygga-bo-dialogen, 2010). They have also established a Swedish environmental classification system which uses energy, indoor environment and chemical substances as rating criteria. In 2005-2006, Sweden was among the first participating countries in the EU GreenBuilding Program and
has in the country Europe's first Greenbuilding Corporate Partner (EU Greenbuilding, 2009a). Starting from 2008/2009, most of the buildings in Sweden are required by law to have their energy declarations shown at the entrance of the buildings (Fastighetsägarna Sverige, 2007). In 2009, the Sweden Green Building Council was founded, with the main goal of developing and promoting a common certification system that is tailored to needs and values of the Swedish real estate market, while at the same time can be used as a benchmark both nationally and internationally. The council aims to become a full member of the World Green Building Council which represents the building sector of the entire world in 2011 (Sweden Green Building Council, 2010).

### 3.4.2 Current issues

Currently, more than 37 different classification systems are being used in Sweden, including the internationally recognized ones as mentioned above and the local ones such as Svensk Miljöbas and Byggvarubedömningen (Sundkvist et al, 2006). While some of the systems cover all aspects of the buildings, some only look at a certain aspect. The evaluation methods and standards also vary. These have made the comparison among them very difficult, which hinders the communication of the benefits of the certificated buildings to the intended parties (Bonde et al, 2009), and further discourages the certification and development of sustainable buildings. Since it takes time for the ambition to introduce an ideal and uniform Swedish classification system to realize, it is anticipated that the current situation is likely to remain in the years to come, with bigger market players leaning to the international classification systems and smaller players to the local ones (Bonde et al, 2009). Commercial property owners are also more keen on getting certificated since they have more international tenants (Bonde & Zakrisson, 2008).

Another issue with sustainable buildings in Sweden is a lack of incentive. In Sweden, like in many other countries, energy consumption in buildings is usually of the primary concern, since it is not the kind of resource that country has an abundant supply of and energy prices have been on a rising trend. The energy cost is, therefore, usually rather high and a big proportion of the operating costs. Besides, heating, cooling and water costs are usually included in the fixed rent, while electricity cost is paid by the tenants. This leaves not so much incentive for the tenants to save on heating, cooling and water usage or invest in these areas (Bonde et al, 2009).

These two issues need to be addressed if sustainable buildings are to prosper in Sweden.
4. The subject companies

A total of 9 interviews were conducted with representatives from 9 of the biggest (in terms of total area of properties) commercial property owners in Sweden. Of them 2 have property portfolios with concentration on office buildings, 3 on retail properties (including stores and shopping centers) and 4 on both. (Figure 4-1) All of them have all or a large proportion of their properties located in the Greater Stockholm area; 6 of them have properties in Gothenburg; 4 have properties in Malmö and 5 have properties in other parts of Sweden. (Figure 4-2) When looking at the form of ownership, 4 of the companies interviewed are private listed companies (publik AB), 4 of them are private companies (privat AB), and 1 is a foreign private listed company with major operations in Sweden. (Figure 4-3)

Figure 4-1 Property portfolio concentrations
Figure 4-2 Property locations
Figure 4-3 Forms of ownership
In terms of the total areas of commercial properties, 1 has larger than 2 215 000 m² (extra large organization – Area XL), 6 have between 481 000 m² and 694 000 m² (large organizations – Area L), while 2 have between 240 000 m² and 354 000 m² (medium organizations – Area M). (Figure 4-4) In terms of the annual gross rental income (hyresintäkter, as in 2009), 1 has more than 5800 million SEK (extra large organization – Income XL), 4 have between 1200 million and 2400 million SEK (large organizations – Income L), while 4 have between 200 million and 600 million SEK (medium organizations – Income M). (Figure 4-5)

Figure 4-4 Organizational sizes by total areas  
Figure 4-5 Organizational sizes by annual gross rental income

Basing on: 1, if a position of environmental manager or similar is available; 2, if a clear environmental policy is available; 3, if a clear sustainability plan/report is available; 4, at what level have efforts on environmental work been recognized, the companies' levels of dedication to environmental work were investigated. 7 of the subject companies interviewed have someone specially responsible for environmental issues, serving as environmental manager. All of them have very clear environmental policies. 4 of them have produced very detailed sustainability plans/reports. 2 of them have had their environmental work highly recognized, 4 have been moderately recognized while the rest have not been clearly recognized. (Table 4-6) Based on these, the companies are divided into 3 groups – 2 fall into the category of high environmental dedication (H), 4 into high to medium environmental dedication (H-M) and 3 into medium environmental dedication (M). (Figure 4-7)
<table>
<thead>
<tr>
<th>Availability of environmental managers</th>
<th>Availability of clear environmental policies</th>
<th>Availability of clear sustainability plans/reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>78%</td>
<td>100%</td>
</tr>
<tr>
<td>No</td>
<td>22%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Environmental work recognized

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly</td>
<td>22%</td>
</tr>
<tr>
<td>Moderately</td>
<td>44%</td>
</tr>
<tr>
<td>Not clearly</td>
<td>34%</td>
</tr>
</tbody>
</table>

Table 4-6 Dedication to environmental work

![Levels of dedication to environmental work](image)

Figure 4-7 Levels of dedication to environmental work

When it comes to the interviewees, 4 of them have worked in the companies for equal to or more than 10 years, 4 of them have worked between 2 to 4 years and 1 has worked for less than 1 year. (Figure 4-8) Regarding their positions at the companies, 7 of the interviewees work as environmental managers while the others take other directive positions (Figure 4-9)

![Years of service at the companies](image)

Figure 4-8 Years of service at the companies

![Positions at the companies](image)

Figure 4-9 Positions at the companies
5. Opinions on the sustainable building trend

5.1 Drivers of the trend

The two main factors that are driving the sustainable building trend have been identified as lower operating costs and rising tenant interest/demand. The energy cost has always been a major part of the operating costs for Swedish companies and with the energy prices on a rising trend, the energy saving feature of sustainable buildings is overwhelmingly embraced by both property owners and tenants. This is also the main source of economic benefits of sustainable buildings. As for the rising tenant interest/demand, it was mentioned by the interviewees that “tenants will definitely choose sustainable buildings over the other choices if they are comparable in price and location” and “in a few years, the sustainability of buildings will be a major concern for tenants”.

The other drivers of the sustainable building trend have been indicated as: firstly, owning sustainable buildings would gain the early birds competitive advantage over the short term when not the entire market has responded yet; secondly, the current business environment is favoring the trend; thirdly, big market players respond more actively to the trend and are leading the entire market towards it; fourthly, high rent could be charged on sustainable buildings; and last but not least, investing in sustainable buildings is simply a profitable business. (Figure 5-1)

![Figure 5-1 Factors that drive the sustainable building trend](image)

5.2 Effects of the trend

When asked about how the sustainable building trend would affect their companies, some interviewees pointed out that incorporating sustainability in their properties was something that they had to do and they felt a constant pressure of doing so. Some also said that the sustainability aspect has always been part of the properties as a product and was part of the companies' development
strategies.

5.3 The investment performance of sustainable buildings

All of the interviewees believed that the investment performance of sustainable buildings would be better than the traditional ones within the short and medium terms. More than half believed it would happen in the short term (less than 5 years); while 33% believed it would happen in the medium term (5-10 years). Noticeably, one interviewee said that sustainable buildings started to pay off in day one and were already better than their traditional counterparts in terms of investment performance. (Figure 5-2) One interviewee see the trend progressing faster in big cities. There, comparable choices are abundant, competition is more keen and tenants tend to move more frequently. Having sustainable buildings within the property portfolio would soon be a must to stay in the market.

![Pie Chart](image)

Figure 5-2 The investment performance of sustainable buildings will be better than the traditional ones within...?

Figure 5-3 to Figure 5-6 try to investigate whether there is a relationship between the interviewees' beliefs on in what time frame sustainable buildings will outperform the traditional ones and the subject companies' form of ownership, total area of properties, annual gross rental income and levels of dedication to environmental work. As shown in Figure 5-3, private-owned companies have a slightly more optimistic view on the investment performance of sustainable buildings than the private listed ones. When it comes to the sizes of the companies, the total area of properties is positively related to the optimistic level on the investment performance; while this relationship is weaker regarding rental income. (Figure 5-4 and 5-5) Companies that perform their environmental work at a very dedicated level have an obvious positive view on the investment performance of sustainable buildings, which is a quite reasonable observation. On the other hand, those companies that are on high to medium and medium levels of dedication do not seem to be
very confident about the investment performance of sustainable buildings in particular. (Figure 5-6)

Figure 5-3 The investment performance of sustainable buildings compared with the traditional ones by ownership

Figure 5-4 The investment performance of sustainable buildings compared with the traditional ones by total size

Figure 5-5 The investment performance of sustainable buildings compared with the traditional ones by rental income

Figure 5-6 The investment performance of sustainable buildings compared with the traditional ones by environmental work dedication level

5.4 Will sustainable buildings become the standard?

Another view held by researchers is that sustainable buildings will be superior in investment performance, not because the return will be higher with sustainable buildings, but because they will become the absolute standard. The traditional ones will become obsolescence and thus have a worse than before investment performance. 67% of the interviewees agreed with this view. Of them, 2
believed this would happen in the short term while 4 believed this would happen in the medium term. (Table 5-7)

<table>
<thead>
<tr>
<th></th>
<th>Short term</th>
<th>22%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium term</td>
<td>44%</td>
<td></td>
</tr>
<tr>
<td>Not relevant</td>
<td>34%</td>
<td></td>
</tr>
</tbody>
</table>

Table 5-7 Will sustainable buildings become the standard with the traditional ones becoming less profitable?

5.5 *Summary and discussion*

- The two main drivers of the sustainable building trend were thought to be lower operating costs and rising tenant interest/demand - a view that is consistent with the current literature.
- Incorporating sustainability in the properties was considered very important and necessary by all subject companies.
- All of the interviewees believed that the investment performance of sustainable buildings would be better than the traditional ones within the short and medium terms (within 10 years). This trend would progress even faster in bigger cities. A similar study conducted by the Green Building Council of Australia showed a less optimistic view, with all respondents opting for the medium to long term (Green Building Council of Australia, 2008).
- Subject companies that are private-owned, have larger total area of properties, or are very dedicated to their environmental work are more optimistic about the investment performance of sustainable buildings. The first observation should be noted because it differs from the common belief that private companies are lagging the private listed ones in the area of sustainable buildings.
- Alternatively, more than half of the interviewees believed sustainable buildings would become the industry standard and the traditional ones would become obsolescence over the short to medium term.
- Overall speaking, according to this study, the Swedish property owners exhibit a very embracing attitude towards the sustainable building trend and appear to be relatively more optimistic about their investment performance than their Australian counterparts.
6. Experience with sustainable refurbishment and initiatives for it

6.1 Experience with sustainable refurbishment

45% of the subject companies have already had experience carrying out sustainable refurbishment projects, while 22% of them have such projects under progress at the time of the interviews. 11% of the companies have not had such experience yet but have made clear plans for sustainable refurbishment projects which will soon be carried out. The rest 22% would certainly consider this in the near future but have not made very detailed plans for it yet. (Figure 6-1)

![Pie chart of experience with sustainable refurbishment](image)

Figure 6-1 Experience with sustainable refurbishment

Figure 6-2 to Figure 6-4 try to explore whether there is any relationship between the subject companies' experience with sustainable refurbishment and their form of ownership, total area of properties and annual gross rental income. Figure 6-2 shows that private listed companies are leading the private-owned ones in practical experience with sustainable refurbishment. Figure 6-3 and Figure 6-4 indicates that bigger companies, in terms of total area of properties and annual gross rental income, also have more experience with sustainable refurbishment.
6.2 Initiatives for sustainable refurbishment

In this section, the interviewees were given a set of possible sources of initiatives to start sustainable refurbishment and were asked to vote for the most common ones in their cases. The initiatives vary among different companies and in different situations. The main ones are presented below.

6.2.1 The companies and their owners/shareholders

Most interviewees see the main initiative coming from the companies themselves, with sustainable
refurbishment seen as adding to a socially responsible and “green” public profile, as part of the company strategy/policy, as an insurance to secure competitiveness in the future market, as a measure to improve worsening property performance, or simply as profitable investment. In the last case, refurbishment might be kicked off even when the property is still in good physical condition but, for example, is using too much energy. Sustainable refurbishment can also be initiated by owners/shareholders of the companies who specially favor socially responsible property investment. They can require the companies to improve the properties' sustainability through sustainable refurbishment.

6.2.2 The tenants and their customers

Quite often, the tenants can take initiative to start sustainable refurbishment, which is triggered by their rising operating costs, by the need to create a good “green” company profile or by demand from their customers, such as visitors to the stores and shopping centers in the case of retail properties. Hence, tenants' customers can also be initiators of sustainable refurbishment and are probably the ultimate source of power since they are the real end-users and can have a very big saying if they are large enough in number, although this is still not very obvious at the moment.

Here, an important question is, if the tenants can initiative sustainable refurbishment, are they willing to pay higher rent? The absolute majority of the interviewees said no, at least not now, but it might happen in the near future. Tenants nowadays still have quite strong bargaining power over the rent, given the wide selection of choices they have when deciding their premises, especially in big cities and under the current economic situation. As one interviewee commented, “Higher rent can not be charged only because the building is green, it has to be negotiated with the tenants on the premise that there are economic benefits for them to enjoy”. One possibility suggested is that if tenants see their high operating costs as problematic, and if the higher rent they pay have a payback time shorter the remaining lease period, they might be willing to pay higher rent for sustainable buildings. This point will be further discussed later.

6.2.3 Good timing

Very often sustainable refurbishment is carried out simply because it is time for it. As suggested by Aikivouri (1996), refurbishment projects may be started because the buildings are physically worn-out (20-40 years old) or in anticipation of possible obsolescence. This is also true in the case of sustainable refurbishment. Another good timing is when there are tenant switches and vacancies are high. This would be a good opportunity to make the buildings more sustainable while at the same
time minimize the disturbance to tenants' normal business operations, which is very much appreciated by both existing tenants and potential tenants. In the case of shopping centers, refurbishment could be needed because of tenants' increasing need for higher profitability per m² and hence smaller rental space. This would be a good timing to incorporate sustainability to the buildings as well.

6.2.4 Changes in legislations/regulations

Lastly, sustainable refurbishment can be initiated in anticipation and preparation for new and tightening legislations/regulations. The common belief is that legislations/regulations on the environmental impact of buildings will only be more and more strict. As suggested by one interviewee, for any property related investment that has a horizon of 10 to 20 years, it would be very unwise to make it not sustainable. It will simply not be within the consideration of any property owner with a long term business focus.

Ranking of the different initiators is shown in Figure 6-5.

![Bar chart showing ranking of different initiators for sustainable refurbishment](image)

Figure 6-5 Initiatives for sustainable refurbishment

6.2.5 Initiatives for sustainable refurbishment and features of the companies

Similarly, analysis trying to capture the relationship between initiatives for sustainable refurbishment and the subject companies' form of ownership, total area of properties, annual gross rental income and dedication level to environmental work was performed. (Figure 6-6 to Figure 6-9) Figure 6-6 shows that for private listed companies, the main initiatives to start sustainable refurbishment come from the companies themselves and right timing, while for private-owned
companies all of the suggested initiatives are quite equally likely. As shown in Figure 6-7 and 6-8, there does not seem to be a very clear relationship between the source of initiatives and the company size in terms of total area and rental income. From Figure 6-9, however, it can be seen that companies that are highly involved in their environmental work are also more used to taking the initiative to start sustainable refurbishment. Companies with medium level of dedication to environmental work would also most often take their own initiatives to start sustainable refurbishment.

Figure 6-6 Initiatives for sustainable refurbishment by ownership

Figure 6-7 Initiatives for sustainable refurbishment by total area

Figure 6-8 Initiatives for sustainable refurbishment by rental income

Figure 6-9 Initiatives for sustainable refurbishment by environmental work dedication level
6.3 Summary and discussion

- Similar as indicated in the literature, all companies interviewed have had sustainable refurbishment under their agenda. The absolute majority of them have either had experience with sustainable refurbishment or had made clear plans for it.

- Private listed companies are leading the private-owned ones in carrying out sustainable refurbishment. A possible explanation for this is that there is a bigger need for private listed companies to make sure their investments reflect the interests and preferences of the general public that is usually more in support of socially responsible investment. Another reason might be that private listed companies are generally richer in capital and are thus less conservative in choosing to do sustainable refurbishment which the market is not very familiar with yet.

- Bigger companies are leading in sustainable refurbishment – an observation that is consistent with their roles as market leaders.

- Initiatives to start sustainable refurbishment would mostly come from the companies themselves and their owners/shareholders, showing that engaging in sustainable refurbishment is more of a company strategic issue in the Swedish market. One point noteworthy is that for companies that are extra large in size, tenants and their customers do not appear to play a role in initiating sustainable refurbishment. The result differs from the similar research conducted by the Green Building Council of Australia where tenant demand was found to be the biggest drive (Green Building Council of Australia, 2008).

- Tenant demand, which came from their own customer demand or the wish to lower operating costs, was thought to be the second biggest initiative. However, they are not yet willing to pay higher rent for sustainable buildings – an observation that is consistent with the current research view on the matter. Since sustainable buildings are so new, there has not been sufficient data showing that a rent premium is associated with them.

- Noticeably, all interviewees said whenever their companies carried out refurbishment, they always tried to make the properties more sustainable, whenever possible. This shows that sustainability has always been a point to note for these property owners.

- For private listed companies, initiatives to start sustainable refurbishment come mainly from the companies themselves and right timing.
7. Investment profitability

7.1 Financial return vs sustainability

An interesting issue about the investment decisions on sustainable refurbishment is to see how important is reaching sustainability compared with financial return for property owners. Can profits ever be compromised in exchange for higher sustainability?

As indicated by Figure 7-1, for all subject companies, financial return can not be compromised. As mentioned by one interviewee, “financial return is always the bottom line for any business”. Among them, 44% suggested that financial return was a must to fulfill in all projects; 44% believed that both aspects were important and would be ensured in their projects; another 12% see both as a must and that they will never carry out a project that is profitable but environmentally undesirable.

![Figure 7-1 How important is reaching sustainability compared with financial return?](image)

Figure 7-2 shows that compared with private-owned companies, private listed companies tend to give a higher weight to the sustainability aspect during their decision making. When looking at the large and medium size companies, there does not seem to be any positive relationship between the company sizes (in terms of total area and rental income) and how much they value sustainability in their decision-making. (Figure 7-3 and 7-4). From Figure 7-5, it can be observed that the level of dedication to environmental work is positively related to how important the sustainability of refurbishment is regarded.
7.2 The keys to profitability

When it comes to the keys to profitability, it was noted by some interviewees that as long as the right measures are taken, sustainable refurbishment could be very profitable and improve the sustainability of buildings greatly. As one interviewee indicated, refurbishing some buildings from the 1980s could yield as much as 15-20% return.

An important point noted by interviewees with rich practical experience in the subject was that the plan to make the building more sustainable had to be made at an early enough stage of the project. If this is fulfilled, with the wide selection of technologies available in the market today,
sustainable refurbishment will not be particularly more expensive.

Another interviewee emphasized the importance of starting by taking small and steady steps towards the final goal of increasing the sustainability of properties. Big scale projects can be expensive and risky, while there exist small measures with high profits and short payback period and can greatly reduce the environmental impact of buildings that can be readily taken. For example, separate switches can be installed in retail properties so that lighting, heating and cooling can be turned on and off according to the needs of different divisions. Separate water meters can also be installed to help shape tenants' water saving behaviors.

7.3 Required payback period

The interviewees were then asked to estimate a timeframe within which they would expect a typical sustainable refurbishment project (one that does not involve refurbishing the whole building) to reach profitability. Through this, their tolerance on the payback period of sustainable refurbishment were sought. For many of the subject companies, there is no definite required payback period and it varies from case to case. Generally speaking, the payback period should be within the remaining lease period. On the other hand, for companies that hold a long term perspective on their investment, the payback period is not of a very big concern and there can be no requirement for it. 37.5% of the subject companies would expect a payback within 5 years while 25% would find 10 years acceptable. (Figure 7-6) One interviewee also mentioned that while a longer payback period could be accepted for a pilot project, the following ones should fall into the normal range.

![Figure 7-6 Required payback period of sustainable refurbishment projects](image-url)
7.4 Investment calculation

7.4.1 Investment calculation method

All interviewees named the Internal Rate of Return (IRR) as the investment calculation method, while one third of them would also use the Discounted Cash Flow (DCF) method.

7.4.2 Key features considered and their impact on parameters

The most critical questions in making investment decisions on sustainable refurbishment would be – Given the current market situation, which features of sustainable buildings should be reflected quantitatively, which should only be kept in mind and which should not be taken into consideration at all? How do these features affect the parameters in the investment calculation? These affect the expected return of a proposed sustainable refurbishment project directly and whether it is profitable enough to be started. If this step is not done properly, profitable projects could be missed out and unprofitable projects could be mistakenly taken.

In this section, interviewees were given a list of key features of sustainable buildings summarized from the literature and were asked to comment on each one of them, mainly on whether a certain feature was reflected in the investment calculation, only kept in mind or not considered. The key features that have been covered in the literature are elaborated first in sections 7.4.2.1 to 7.4.2.8, responses from the interviewees were presented in 7.4.2.9.

7.4.2.1 Lower operating costs

This is usually a most commonly considered feature by property owners. Operating costs can include heating, cooling, water and electricity costs. In Sweden, the first three are usually included in the fixed rent and are paid by property owners. Any saving on these should be very meaningful to them. Electricity cost is usually paid directly by the tenants but property owners can still save on the electricity used in the common areas of the buildings. In cases where all operating costs are paid by the tenants directly, property owners will not be able to benefit directly from this feature but might be able to gain on it indirectly through, for example, higher rent. This point will be further discussed later.

7.4.2.2 Lower vacancy

Given the many benefits sustainable buildings can deliver to the tenants, one can deduce that vacancy should be lower in these buildings. If so, this is a factor that should be included in the calculation.
7.4.2.3 Improved public profile

For property owners, a main intangible gain from holding sustainable buildings is the improved corporate image and reputation which would benefit all areas of their business. Since it is hard to quantify this factor, a possible way to bring it into the decision-making is to allow a slightly lower return for sustainable refurbishment projects.

7.4.2.4 Higher marketability

Marketability refers to the ability of a property to be rented out and is the area that sustainable buildings are believed to be very strong in. Besides their numerous appeals to tenants in general, sustainable buildings are also preferred choices for some specific groups of tenants. To start with, tenants whose business areas are considered to be environmentally destructive or unethical, for example, petroleum companies and tobacco companies, tend to wish to neutralize their negative public image through locating in sustainable premises (Eichholtz et al, 2009). On the other hand, companies that are in the energy and environment business are naturally more willing to stay in sustainable buildings so as to be consistent with their business focus (Van der Schaaf & Sandgärde, 2008). Moreover, government authorities and NGOs usually set higher sustainability standard on the premises they work in. Lastly, companies that rely very heavily on their employees' work performance to generate profits, such as banks and law firms, would also prefer sustainable buildings primarily because working in them can help improve the well-being and productivity of the staff (Eichholtz et al, 2009). Sustainable buildings, therefore, have a wider customer group than the traditional ones and enjoy higher marketability.

7.4.2.5 Higher rent

Although the common belief among property owners is that tenants nowadays are not yet willing to pay higher rent for sustainable buildings, there is still a possible mechanism to make this happen, as suggested by some interviewees. The total rent paid by the tenants include the fixed part and the variable part. The fixed part is calculated by multiplying the rent per m² by the total area rented; while the variable part depends on the actual consumption of, for example, electricity. As the energy prices go up, the variable rent increases as well, leading to a higher total rent. However, if the electricity consumption can be lowered through sustainable refurbishment, the variable rent can be reduced. This creates a possibility for property owners to charge a higher fixed rent per square when negotiating new contracts with the tenants, if they can show that increase in the fixed rent can be well offset by savings on the variable rent and that in total the tenants are still better-off. The increase in fixed rent can add to property owners' income and be used to pay for the refurbishment.
In the latter case, the reduction in variable rent should be the highest possible amount that property owners could consider investing in the refurbishment if they are expecting that the project cost will be largely covered by the increase in fixed rent. To put it simple, by allowing both parties to share the benefit from reduced operating costs, the whole mechanism could create a win-win situation. Figure 7-7 shows an example of the mechanism, with the left-hand side of the figure being the situation without sustainable refurbishment and the right-hand side with it.

![Graph showing the comparison of rent with and without sustainable refurbishment](image)

**Figure 7-7 Example on how high rent can be charged with sustainable refurbishment**

### 7.4.2.6 Attract better tenants

As mentioned above, sustainable buildings tend to attract tenants that value corporate social responsibility. They usually have more stable business and are more responsible tenants (Green Building Council of Australia, 2008). Risks associated with these better quality tenants are lower and this could be a factor to be included in decision-making.

### 7.4.2.7 Lower liability risk

Liability risk here means the risk of being held liable for either damage done to the construction workers and occupants, or damage done to the surrounding environment because of the building. This is a factor that can be greatly reduced with sustainable buildings and insurance expenses could thus be lowered - a possible point to note when making decisions as well.

### 7.4.2.8 Cheaper to finance

Because of sustainable buildings' “future-proof” feature, borrowing conditions for these projects have already been made easier by the banking sector in some cases (Lorenz, 2006). The next possible step could be cheaper financing. If this happens, it is certainly a factor to keep in mind.
7.4.2.9 Responses from the interviewees

Figure 7-8 shows features of sustainable buildings that are reflected quantitatively in the investment calculation, according to the interviewees. The lower operating cost of sustainable buildings is most highly regarded, with 89% of the interviewees indicating that it would be reflected in the investment calculation. Half as mentioned is the second feature, lower vacancy.

As far as the improved public profile is concerned, only one third of the interviewees said a slightly lower return, such as 0.5%, could be accepted for sustainable refurbishment projects considering that the positive influence they bring to the other areas of the business. However, the costs involved in getting the building certified, for example, could probably be excluded from the calculation.

One third of the interviewees see the higher marketability feature as necessary to include in the calculation, as some believed tenants would be looking for sustainable premises within a few years and some already see this happening.

23% of the interviewees suggested that the higher rent feature should be reflected anyway, although if agreement could be made with tenants beforehand, all subject companies would mostly likely reflect this in the calculation.

The attracting better tenant and lower liability features are not so highly regarded. For the former, it is hard to quantify this kind of factor; for the latter, it is not a very big concern for most Swedish property owners, since the building quality in Sweden have always been quite good. For companies that have checked on their tenants' business nature before signing the lease, this is also not a very big concern.

Many of the interviewees believed it might be cheaper to finance sustainable refurbishment in the future, but so far nothing could be observed. For companies that get their projects financed by their owners, it is probably easier to get sustainable refurbishment approved and financed.

Figure 7-9 summaries all features that are considered, including those mentioned above and those that are only for the decision-makers to keep in mind. In the latter case, higher marketability is most highly regarded. The rest of the ranking is the same as in Figure 7-8.
In practice, what features to take into consideration vary case by case. As one interviewee suggested, if sustainable refurbishment was to be done primarily to change the situation of worsening performance of the building, then factors like higher marketability, attract better tenants and lower vacancy would naturally be emphasized in the decision-making.

### 7.5 Sensitivity analyses

Two sensitivity analyses were carried out after analyzing responses collected in the interviews. The first was to see how the mechanism described in section 7.4.2.5 could work for a hypothetical commercial building and how much higher rent could actually be charged. The second was to see how IRR would respond to changes in the main features of sustainable buildings. Three key impacts were selected for this: decreased operating costs, increased occupancy ratio and increased rent derived from the first sensitivity analysis. These factors were selected because they should have direct impact on the profitability of refurbishment projects and were relatively easier to quantify.

#### 7.5.1 The base case

Operating costs are shared by tenants and property owners, with property owners paying for the heating, cooling and water costs and tenants paying for the rest (mainly electricity cost). Maintenance cost covers daily maintenance and is paid by property owners. The figures of rent and the various costs are approximations to market situation. A investment timeframe of 5 years was set for illustration purpose. Details of the basic information can be found in Table 7-10.
Total rentable area (sqm) 20000
Rent (kr/sqm) 1500
Operating costs paid by tenants (kr/sqm) 100
Operating costs paid by property owners (kr/sqm) 400
Maintenance cost (paid by property owners, kr/sqm) 100
Investment timeframe (yrs) 5

Table 7-10 Basic information

Growth rates for water and energy prices were set higher than the expected 2% inflation, at
5%, which is a quite reasonable estimate given the rising energy prices nowadays. The decrease in
operating costs and increase in occupancy ratio were set based on figures found in the literature.
Details of the assumptions is shown in Table 7-11.

| Annual growth rate of water & energy prices | 5,00% |
| Inflation | 2,00% |
| Occupancy ratio | 90,00% |
| Decrease in operating costs | 40,00% |
| Increase in occupancy ratio | 3,50% |

Table 7-11 Assumptions

7.5.2 How higher rent can be charged

Using the inputs from Table 7-10 and 7-11, the highest possible increase in rent was calculated to be
2.6%, so that given the increase in fixed rent and decrease in variable rent (from decrease in
operating costs), the total rent after the refurbishment stays lower than the total rent before it.

The decrease in operating costs was then set to be 20%, 30%, 50%, 60% to see how the
increase in rent changes accordingly. It can be seen from Table 7-12 that as the decrease in
operating cost rises by 10%, the increase in rent goes up by 0.6-0.7%.

<table>
<thead>
<tr>
<th>Sensitivity analysis (rent)</th>
<th>Increase in rent</th>
<th>Change in increase in rent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease in operating costs 20%</td>
<td>1,30%</td>
<td></td>
</tr>
<tr>
<td>Decrease in operating costs 30%</td>
<td>2,00%</td>
<td>0,70%</td>
</tr>
<tr>
<td>Decrease in operating costs 40%</td>
<td>2,60%</td>
<td>0,60%</td>
</tr>
<tr>
<td>Decrease in operating costs 50%</td>
<td>3,30%</td>
<td>0,70%</td>
</tr>
<tr>
<td>Decrease in operating costs 60%</td>
<td>4,00%</td>
<td>0,70%</td>
</tr>
</tbody>
</table>

Table 7-12 The first sensitivity analysis

7.5.3 Sensitivity of IRR

The mostly likely increase in rent (2.6%) that was derived from the first sensitivity analysis, was
then incorporated into modeling the sensitivity of IRR. From Table 7-13, it can be seen that given
the same percentage change (2%) in operating costs, occupancy ratio and rent, IRR is most sensitive
to changes in the latter two - a 2% change in them can result in 4 times the percentage change in
IRR. Detailed calculations of the two sensitivity analyses can be found in Appendix 2.

<table>
<thead>
<tr>
<th>Sensitivity analysis (IRR)</th>
<th>Project IRR</th>
<th>Change in IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease in operating costs 38%</td>
<td>10,09%</td>
<td></td>
</tr>
<tr>
<td>Decrease in operating costs 42%</td>
<td>12,76%</td>
<td>2,67%</td>
</tr>
<tr>
<td>Increase in occupancy ratio 1,5%</td>
<td>7,20%</td>
<td></td>
</tr>
<tr>
<td>Increase in occupancy ratio 5,5%</td>
<td>15,51%</td>
<td>8,31%</td>
</tr>
<tr>
<td>Increase in rent 0,6%</td>
<td>6,76%</td>
<td></td>
</tr>
<tr>
<td>Increase in rent 4,6%</td>
<td>15,90%</td>
<td>9,14%</td>
</tr>
</tbody>
</table>

Table 7-13 The second sensitivity analysis

7.6 Summary and discussion

- As indicated by all interviewees, sustainability is an important consideration in reaching refurbishment decisions, but financial return can not be compromised – a view that is consistent with the literature. The responses only differ in whether reaching sustainability must be fulfilled at the same time or not. For property owners with high dedication levels to environmental work, whether an investment is sustainable or not does affect whether it would be taken. However, financial return is always the bottom line, meaning that no investment with lower-than-required return would be accepted only because it is sustainable. In this sense, sustainable refurbishment does not differ so much from a regular investment. After all, for profit-making organizations, only projects that reach both financial and sustainability goals at the same time can actually be seen as “sustainable”.

- One popular mentality about realizing sustainability within the business sector is that there is always a trade-off between profitability and sustainability. “Greener” very much means more expensive. This is the main reason why socially responsible investment is very often only associated with public profile building. Interestingly, opposite to this common belief, a few interviewees said that by their experience, as long as the right measures were taken, high profits and sustainability could come hand in hand. There is not necessarily a trade-off between the two. This indicates that sustainable refurbishment does have a bright future in the economic sense.

- Private listed companies tend to give a higher weight to the sustainability aspect when carrying out sustainable refurbishment, probably because of their generally bigger interest in socially responsible investment and because of their relatively higher tolerance towards the short-term loss that could be incurred.
• The level of dedication to environmental work is positively related to how important the sustainability of refurbishment project is regarded, which is a very reasonable observation.

• The key to profitability for sustainable refurbishment is to take the right measures. According to practical experience, two areas can be focused on. First, the decision to make the refurbishment sustainable has to be made at an early enough stage of the project. Second, it would be a good idea to start by taking small scale projects, since the risk is lower but the return can be surprisingly high. In short, it is important to plan ahead and not be over-ambitious.

• The subject companies generally expect a payback period shorter than the remaining lease period. More than half of them would accept a payback longer than 5 years, exhibiting a level of tolerance that is a little higher than the strictly profitable limit.

• All interviewees identified the Internal Rate of Return (IRR) as the main investment calculation method, while the Discounted Cash Flow (DCF) approach was also used by some.

• The lower operating cost of sustainable buildings is most often reflected in the investment calculation, while the higher marketability feature, although not necessarily reflected in investment calculation, is a factor that is affecting the decision to invest in sustainable refurbishment to the largest extend. This result is consistent with the similar study conducted by the Green Building Council of Australia (Green Building Council of Australia, 2008).

• Lower vacancy is the next biggest factor to be taken into the investment calculation of sustainable refurbishment.

• Although improved public profile brought by owning sustainable buildings can benefit the companies' entire business, a project yielding obviously lower-than-required return would not be accepted by the subject companies only because of this.

• Higher rent could be charged if the combination of increased fixed rent and decreased variable rent results in a lower total rent. This is not yet happening at the moment but could happen in the near future. After all, it is logical that tenants would pay for buildings that offer them many extra benefits. Only a small group of interviewees believed that the higher rent factor should be reflected in calculation regardless of if agreements on the increased rent have been made with the tenants or not. While they might be bearing the risk of overestimating the profitability of sustainable refurbishment projects, those that do not
include this factor in their calculation might incur the risk of forfeiting a profitable project. Whether to factor in the higher rent is largely a matter of how optimistic the company is about whether tenants would pay a premium for sustainable buildings and how risk-averse the companies' shareholders are. A safe choice is probably to include the factor in the calculation only when such agreements have been made with the tenants, especially when the project is carried out at the beginning of the lease period.

- Factors that are not considered at the moment include attracting better tenants, lower liability and cheaper to finance. While in the Australian case, attracting better tenants is very highly regarded (Green Building Council of Australia, 2008).

- The first sensitivity analysis shows that the increase in rental income that is gained from lower operating costs does not seem so significant when it comes to sustainable buildings. Even if operating costs can be lowered by a very large extent, the increase in rent is still very limited. Even if tenants in the future are willing to pay higher rent, the extent of it would still not be very big. The reason lies in the fact that operating costs still do not account for a very significant portion of the total rent paid by tenants. This situation might, however, change if energy prices rise much more and faster in the future.

- The second sensitivity analysis shows that IRR is most sensitive to changes in occupancy ratio and rent, which comes at no surprise. If refurbished sustainable buildings fail to offer higher occupancy ratio and rent, the property owners will suffer a big loss in the projects. Although the analysis is only hypothetical, it points out the areas that property owners should pay extra attention to when making assumptions before doing investment calculation of sustainable refurbishment.
8. Levels of sustainability aimed, project execution and barriers to sustainable refurbishment

8.1 Level of sustainability aimed

Another main issue in sustainable refurbishment is how sustainable the buildings should become. The most direct way to measure this is probably through the few widely recognized building classification systems, i.e. LEED, BREEAM and EU Greenbuilding. Discussions about the systems are on the agenda of 89% of the subject companies. The absolute majority of them are still in the stage of exploring which system works best for them, through trying them out themselves in their projects, internal investigation on the systems or observing the market trend. 86% are aiming for deciding on one system to use eventually while the rest would like to use different systems for different target groups. Of the three most common systems nowadays, most interest is shown towards LEED, followed by EU Greenbuilding and BREEAM. (Figure 8-1)

![Figure 8-1 Level of interest for the classification systems](image)

Some interviewees suggested that applying the existing common systems in the Swedish market was still in an immature stage. An international recognized system adapted to the Swedish case is much sought after. LEED is thought to be a good ground to start with because it applies to both new and refurbished buildings and enables comparison between the two - a critical feature indeed. The founding of the Sweden Green Building Council is an example of such efforts. Another interviewee expressed the concern over the lack of an appropriate system for shopping centers and was working on developing one based on the system developed by “Bygga-bo-dialogen”.

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8.2 Execution of the projects

As far as the actual execution of the projects is concerned, 78% of the subject companies would hire consultants to help with decision-making on, for example technical issues and cost estimation; while the rest would make all the decisions in-house. As for the construction, all subject companies would outsource it to contractors and one interviewee said they would have a close check on the contractors' environmental work as well.

8.3 Barriers to sustainable refurbishment

In this section, interviewees' views on barriers to sustainable refurbishment were sought.

8.3.1 Tenants' mindset and behaviors

One barrier that comes from the tenants' side is that they are prone to underestimate the economic benefits generated from sustainable refurbishment. Very often too much attention is put on the fixed rent, while the real potential of saving lies in the variable part. Unless they see problems with their rising operating costs, they might find it hard to see the real value of sustainable refurbishment and would not treat it so seriously. This situation would however not last so much longer, at least because of the rising energy cost. Another problem is that tenants usually prefer brand new facilities than the refurbished ones and assign a lower value to the latter, which would of course discourage the property owners to do refurbishment.

8.3.2 Property owners' lack of experience

A few property owners mentioned difficulties in choosing between the numerous options (technologies, classification systems, etc) available for sustainable refurbishment, deciding on a balance between cost and benefit and selecting the right building out of the entire portfolio to work on at a specific time. This is primarily because of a lack of practical experience on the subject. Worse still, the market for sustainable buildings and refurbishment is still at the starting stage so there are always a lot of uncertainties involved in the projects. This, however, is not a problem unique to sustainable refurbishment and is likely to be solved as time goes on.

8.3.3 The lack of one unified classification system

As discussed earlier, the lack of one or a set of unified classification system right now will hinder the development of sustainable buildings and refurbishment, since it would cause confusion to the
market participants and make it more difficult to communicate the benefits of sustainable buildings to the intended parties. This is a problem that is widely recognized by property owners and it is already being worked on.

8.3.4 The cost issue

Higher cost is a problem common to many environmental friendly products. As one interviewee suggested, the facilities used in sustainable refurbishment projects were still relatively expensive. However, this situation would change as more and more companies use these facilities and they become the market standard.

8.3.5 The general market condition

Generally speaking, the overall environmental awareness level of the society is still not high enough to support sustainable refurbishment very firmly. The government, the media and the general public are not providing very strong motivation for sustainable refurbishment yet, although a trend towards that direction can be observed. Another issue mentioned by one interviewee was the high labor cost in Sweden. Often it would be cheaper to buy a brand new facility from abroad than refurbishing it locally. This is a factor that would limit the sustainability level that refurbishment could reach.

8.4 Summary and discussion

- LEED is most highly regarded by the subject companies, followed by EU Greenbuilding and BREEAM. Efforts are underway to adapt an internationally recognized classification system to the Swedish property market.
- The majority of the subject companies would hire consultants to help with the decision-making of sustainable refurbishment while the actual construction would be outsourced.
- One third of the interviewees see no big barrier to the development of sustainable refurbishment, except that it takes time for it to gain wide market acceptance. Others mentioned barriers related to tenants' mindset and behaviors, property owners' lack of experience on the subject, the lack of one unified classification system, the cost issue and the general market condition.
9. Conclusion

9.1 The economics of sustainable refurbishment

Fundamentally, for property owners, investing in sustainable refurbishment can be seen as buying an insurance to future-proof their properties. The uncertainties that the properties are being protected against include, among all, increased energy prices, tightening legislations and changing market preferences. Sustainable refurbishment also ensures that the property owners can enjoy all the favorable policies related to sustainable buildings that are likely to be introduced in the future.

Currently, the benefits delivered by sustainable refurbishment to property owners come mainly from two sources: lower operating costs and higher marketability which then leads to lower vacancy. Logically speaking, there exists also possibility to charge a rent premium in the near future. As for project financing, it can be observed that with sustainable refurbishment it would be easier to attract equity from investors and in the future it might even become cheaper to get loans from banks. On the cost side, there have been numerous proofs that if plans are made early and if the right measures are taken, sustainable refurbishment will only cost slightly more or even as much as the traditional one. An overview of the economics of sustainable refurbishment is shown in the following table (Table 9-1), those colored in grey are benefits that are not yet widely observed in the market but might happen in the near future.

<table>
<thead>
<tr>
<th>Income</th>
<th>Expenses</th>
<th>Financing &amp; Equity</th>
<th>Project cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower vacancy</td>
<td>Lower operating costs</td>
<td>Attract equity from investors</td>
<td>Slightly higher or equal</td>
</tr>
<tr>
<td>Higher rental income</td>
<td>Reduced liability</td>
<td>Easier and cheaper loans from banks</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-1 The economics of sustainable refurbishment

The combination of higher income, lower expenses, lower financing cost and equal project cost contributes to improved project cash flow and more profitable buildings, making sustainable refurbishment an attractive investment. During the investment calculation, extra efforts are needed when estimating rental income and vacancy rate.

As for tenants, the benefits of locating in sustainable buildings originate mainly from 3 sources: lower operating costs, more productive workforce and “green” corporate profiles. At the moment, the tenants do favor sustainable buildings, as long as they are comparable in price and location as the other choices.
9.2 Comparison with the literature

Overall speaking, according to this research, the Swedish property owners exhibit a very embracing attitude towards the sustainable building trend and appear to be relatively more optimistic about their investment performance than, for example, their Australian counterparts. Similarities and differences between this research and what can be found in the literature are summarized in Table 9-2.

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drives of the sustainable building trend – lower operating costs and rising tenant interest/demand</td>
<td>The investment performance of sustainable buildings will be better than the traditional ones within: In this research - the short and medium term The Australian case - the medium to long term</td>
</tr>
<tr>
<td>Tenants are not yet willing to pay higher rent for sustainable buildings</td>
<td>Initiatives to start sustainable refurbishment: In this research - from the companies themselves The Australian case - from tenant demand</td>
</tr>
<tr>
<td>Sustainability is an important consideration, but financial return cannot be compromised</td>
<td>Attracting better tenants is: In this research – not considered at the moment The Australian case - very highly regarded</td>
</tr>
<tr>
<td>The majority of the subject companies have sustainable refurbishment under their agenda</td>
<td></td>
</tr>
<tr>
<td>The higher marketability of sustainable buildings is most highly regarded when making investment decisions</td>
<td></td>
</tr>
</tbody>
</table>

Table 9-2 Comparison of this research and the literature

9.3 Limitations of the research

There are three limitations in this research that need to be acknowledged. The first one concerns the scope of the findings. Although market leaders were selected as interview subjects to improve the representativeness of the research, the scope of the study was still restricted by the limited resources available. This research, however, could be a good starting point for more extensive further studies on the subject. Secondly, the interviews were conducted in English while almost all of the interviewees were more comfortable with speaking the local language Swedish. It can be imagined that they might be more talkative and expressive during the interviews if Swedish was used. Lastly, when facing sustainability issues, subjects might give answers indicating environmental dedication levels that are higher than their actual ones – an issue that has been pointed out by previous research as well. This might lead to an over-optimistic general picture of the study results and should be borne in mind.
9.4 Final remarks

To put it simple, sustainable refurbishment shows property owners' economic responsibility to the shareholders and environmental responsibility to our natural environment. When carried out properly, a win-win situation can be created, between the property owners and the tenants, as well as between real estate industry and the natural environment.
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Appendices

Appendix 1 Interview questions

1. How do you think the emerging sustainable building trend would affect the profitability of your company's properties?

2. Do you believe that the investment performance of sustainable buildings will be better than the traditional ones over the

-Short term (less than 5 years)?

-Medium term (5 to 10 years)?

-Long term (more than 10 years)?

3. Will sustainable buildings become the standard and will the traditional ones be disadvantaged over the

-Medium term (5 to 10 years)?

-Long term (more than 10 years)?

4. Does your company have experiences in carrying out sustainable refurbishment projects? If not, does your company have plans of refurbishing the properties into sustainable ones? If not, would it be considered in the near future?

5. Who do you think would take the initiatives to start these sustainable refurbishment projects?

-The tenants? Are they willing to pay higher rent for sustainable buildings?

-The shareholders/investors of the company?

-Following government regulations/preparing for tightening government regulations?

-Asset management decisions?

-The company itself, out of corporate strategy/policy?

-Tenants' customers/Visitors to the shopping centers?

-It is time to do refurbishment, why not make it more sustainable?

-Others?

6. How important is reaching a better sustainable performance relative to financial return when
reaching refurbishment decisions?

7. Within how many years would your company plan to reach profitability?

8. What investment calculations would your company use to reach the decision of sustainable refurbishment?
   -Discounted cash flow?
   -Internal rate of return (IRR)?
   -Others?

9. What key features of sustainable buildings would be taken into account? How are they reflected in the calculations?
   -Lower vacancy rate?
   -Lower operating cost?
   -Lower capital cost?
   -Higher rent?
   -Higher marketability?
   -Improved public profile for the company so lower IRR can be accepted?
   -Attracting and retaining better quality tenants so lower risk?
   -Lower liability risk so smaller discount rate is used?
   -Easier and cheaper to finance so smaller discount rate is used?
   -Others?

10. How would your company decide which level of sustainability to achieve with the refurbishment? Any classification systems used?

11. Would your company outsource the refurbishment projects? To whom?

12. What do you think are the main barriers/difficulties of sustainable refurbishment projects right now?

13. Is there anything about the subject that you think is important but I have not covered in my questions?
**Appendix 2 Sensitivity analyses (base case)**

**Basics**
- Total rentable area (sqm) 20000
- Rent (kr/sqm) 1500
- Operating costs paid by tenants (kr/sqm) 100
- Operating costs paid by property owner 400
- Maintenance cost (kr/sqm) 100
- Investment timeframe (yrs) 5

**Assumptions**
- Annual growth rate of water & energy prices 5.00%
- Inflation 2.00%
- Occupancy ratio 90.00%
- Decrease in operating costs 40.00%
- Increase in occupancy ratio 3.50%
- Increase in rent 2.60%

**Existing tenants**
- (without sustainable refurbishment) 1 2 3 4 5
- Fixed rent 27000000 27540000 28090800 28652616 29225668
- Variable rent 1800000 1927800 2064674 2211266 2368266
- Total rent 28800000 29467800 30155474 30863882 31593934

**Existing tenants**
- (with sustainable refurbishment) 1 2 3 4 5
- Fixed rent 27702000 28256040 28821160.8 29397584 29985536
- Variable rent 1080000 1156680 1238804 1326759 1420959
- Total rent 28782000 29412720 30059965 30724343 31406495

**Property owners**
- (without sustainable refurbishment) 1 2 3 4 5
- Rental income 27000000 27540000 28090800 28652616 29225668
- Operating costs 7200000 7711200 8258695 8845063 9473062

**Property owners**
- (with sustainable refurbishment) 1 2 3 4 5
- Rental income 28779300 29354886 29941984 30540823 31151640
- Operating costs 4488000 4806648 5147920 5513422 5904875

**Property owners**
- (with sustainable refurbishment) 1 2 3 4 5
- Increase in rental income 1779300 1814886 1851184 1888207 1925972
- Decrease in operating costs 2712000 2904552 3110775 3331640 3568187

**Total cash inflow from project** 4491300 4719438 4961959 5219848 5494158

**Project investment** 18000000

**Cash flow analysis**

<table>
<thead>
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<th></th>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
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<td>4719438</td>
<td>4961959</td>
<td>5219848</td>
<td>5494158</td>
</tr>
<tr>
<td>IRR</td>
<td>11,43%</td>
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</tr>
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</table>