Owner organizations’ value-creation strategies through environmental certification of buildings

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The existing literature (mostly referencing heuristics of the valuation profession) provides little evidence on how property owners and managers themselves perceive value creation from environmental certification (EC) of buildings. To address this issue, questionnaire and interview data from non-residential EC building owners in Sweden are gathered and related in a ‘strategy map’ that explains their perceived value creation from EC. The mapping process also considers the four standard perspectives of the balanced scorecard, prompting researchers and owners to evaluate EC in terms of its contribution to long-term strategy, measuring it according to financial and non-financial metrics of organizational performance. The study confirmed that tenant demand is an important EC driver for property owners (particularly for large organizations) and therefore that increased EC awareness amongst tenants is important for EC and for further value creation. It was found that tool developers, property owners and valuers could all benefit from more closely aligning valuers’ documentation requirements with those for accreditation with EC tools. Energy efficiency contributes significantly to value creation, but owners use energy management programs in addition to EC, possibly as a result of the performance gap phenomenon.

Keywords: buildings, environmental assessment, environmental certification, management, performance measurement, property owners, strategy, valuation, value creation

Introduction

Building operation globally accounts for nearly one-third of final energy consumption and energy-related greenhouse gas emissions respectively (International Energy Agency (IEA), 2013). One industry-driven initiative aimed at mitigating buildings’ environmental impacts over the past two decades has been the application of environmental certification (EC) tools, where the US Leadership in Energy and Environmental Design (LEED) tool and UK Building Research Establishment Environmental Assessment Method (BREEAM) tool are amongst the earliest and most widely applied. Since buildings constitute such a large portion of society’s total capital (e.g. Pearce, 2003) it is further important to understand how initiatives aimed at high environmental performance (with or without EC tools) affect their value. Therefore, the past 15 years have seen much work investigating this relationship.

The most direct and easily explained benefits are reduced costs through reduced energy and water demand (Boyd & Kimmie, 2005; Kats, Braman, & James, 2010; Lutzkendorf & Lorenz, 2007; Mudgal, Lyons, Cohen, Lyons, & Fedrigo-Fazio, 2013; Royal Institution of Chartered Surveyors (RICS), 2005) and increased rental income through proximity to public transport hubs and services. Less direct benefits are that conscious material and design choices may lead to reduced maintenance and tenant fit-out costs (RICS, 2005). Meanwhile Kats et al. (2010) refer to over 20 studies finding reduced illness and improved...
Many works have aimed to demonstrate value creation using the heuristics of property valuation professionals. For example, the effect of environmental enhancement on investment risk assessment (Lützkendorf & Lorenz, 2007), discounted cash-flow property valuation (Boyd, 2006) and residual value property valuation (Robinson, 2005) respectively. Statistical research has also compared EC with non-EC buildings in terms of rental income and transaction price (Eichholtz, Kok, & Quigley, 2010; Fuerst & McAllister, 2011a, 2011b; Miller, Spivey, & Florance, 2008). These comparisons use hedonic pricing methods and statistical regression to market data, after applying corrections in input data for non-EC-related attributes. These studies tend to focus on the US market and the LEED tool (covering energy, IEQ, location, materials and water) (USGBC, 2015) and/or the EnergyStar tool (focusing on energy demand) (USEPA, 2014). Transaction price advantages according to this research vary between a finding of no significant difference (according to Eichholtz et al., 2010, for LEED) and an increase of 18% (according to Wiley, Benefield, & Johnson, 2010, also for LEED). Meanwhile advantages in real rental income also vary from no significant difference (according to Eichholtz et al., 2010, for LEED) up to as much as 29% (according to Fuerst & McAllister, 2011b, for LEED and EnergyStar double certification). Such studies suggest that EC has at least no negative effect on financial performance, and possibly a very positive one. One similar study in Europe (where energy standards for code-compliance are considered more stringent than in the US) showed that office properties with higher Energy Performance Certificate grades commanded 6.5% higher rental income (Kok & Jennen, 2012).

Meanwhile valuers and related researchers have tended to remain sceptical. A recent review reflects that ‘the search for a link between the sustainability credentials of a building and its rental or/and capital value began some ten years ago, but is still in its infancy’ (Sayce, Sundberg, & Clements, 2010, p. 5). The same review notes that investor and owner interest in sustainability found in general stakeholder surveys (e.g. Atis Real, 2008; Bowman & Wills, 2008; Cushman and Wakefield, 2009, 2011, 2012; GVA Grimley, 2007; Myers, Reed, & Robinson, 2008), may be a bad predictor of actual behaviour when it comes to making real capital commitments. Warren-Myers (2012) goes even further, dismissing the usability of hypothetical cases (i.e. Boyd, 2006; Robinson, 2005) because they do not use real transaction data. Warren-Myers (2012) also dismisses the studies using market data because the methods applied can make results dependent on factors subjective to the researcher. However, these objections may not be accepted by the broad range of stakeholders, or by important valuation institutions. A leading sustainability-oriented real estate consortium, the Global Real Estate Sustainability Benchmark (GRESB) clearly states its mission as ‘to enhance and protect shareholder value by evaluating and improving sustainability best practices in the global real estate sector’ (GRESB, 2014, p. 3, emphasis added). Separate members of this consortium share this mission, and as of 2014 represent a property value of US$2.1 trillion (GRESB, 2014). Furthermore a recent global survey of valuers found that around one-third are already accounting for sustainability aspects in valuations (Lorenz, Sayce, Michl, Lützkendorf, & Quinn, 2014). The Royal Institution of Chartered Surveyors (RICS) has produced a ‘Guidance Note’ containing a checklist recommending data collection so that ‘as markets become sensitized to sustainability issues, appropriate analysis can be undertaken to support future estimates of value’ (RICS, 2013).

Valuation-based research also tends to interpret value from the point of view of an arm’s-length investor, rather than from that of an owner engaged in a building’s or a portfolio’s day-to-day financial and technical management. Furthermore, the inherent subjectivity in the valuation process gives cause to question its centrality in research up to now, even when acknowledging its importance for financial reporting. Valuation has been described as ‘partly an art and partly a mathematical process’ (Millington, 2000; cited in Guertler, Kaplan, & Pett, 2005). Warren-Myers (2012) also notes that valuation professionals’ work is to ‘reflect’ the market, whilst market players themselves (investors, owners, tenants) drive it. Therefore, there is a need to explain what is actually underlying the kind of interest shown by investors and owners in, for example, GRESB. Earlier research certainly attempts to understand underlying driving forces in some sense. Kimmet and Boyd (2004) invoke the triple bottom line as a way of structuring an organization’s perception of value creation from EC and related initiatives, concluding that:

the real worth of the triple bottom line then is not its calculation as a sum that represents net
present value, but its utility as a guide to investors and managers interested in maximizing future returns.

(p. 17)

So far, there is little literature that has investigated this statement further, and it is this gap that the current paper aims to fill.

EC only became popular in Sweden at the start of the 2010s after the foundation of the Sweden Green Building Council (SGBC), and the introduction of the domestic tool ‘Miljöbyggnad’. This tool uses 15 indicators to assess buildings in terms of energy demand, IEQ and hazardous materials. Credits are awarded as far as possible based on performance after two years of operation (Malmqvist et al., 2011; SGBC, 2014). Alongside this tool, LEED (at the time of the study version 2009; e.g. USGBC, 2013) BREEAM (which at the time of the study had not been customized; e.g. BRE, 2011) and EU Green Building (assessing only energy and energy management; European Commission, 2009) are also popular in Sweden. The work reported here was performed just as soon as there were enough non-residential EC buildings to be able to study EC value creation in this stock.

The aim of this paper is therefore to investigate how property owners and managers perceive value creation from EC buildings. It aims to identify potential differences in value creation perceptions depending on different owner/manager characteristics, the different EC tools mentioned and different building characteristics. The study applies empirical data to existing theoretical approaches to develop a new explanation for owners’ and managers’ perceived value creation. The focus on EC is significant because EC, for better or worse, is a major industry-led attempt to mitigate their negative impact on the environment and the common well-being, and thus worthy of study.

Method

Definition of value

Valuers use many value definitions, e.g. market value, fair value, hope value (or future value), investment value, special value, insurable value alongside supporting definitions such as ‘highest and best use’ (IVSC, 2013). These definitions are predominantly focussed on the ‘value of the investment object’ (i.e. the building) and form the basis for research up to now. In contrast, in this paper value creation is considered to arise from anything which property owners and managers reasonably perceive as making a positive contribution to achieving strategic objectives of their respective organizations (i.e. not the investment objects). The owners referred to in this statement of value are assumed those engaged in all aspects of their assets’ day-to-day financial and technical management.

Research approach

This study aims at broadly identifying and analysing the perception of causal relations (between EC and value creation). It is also aims to explore and propose potential explanations, rather than hypothetico-deductively prove or disprove a particular explanation. Therefore the research design applies qualitative analytical methods since they are best suited to fulfilling such aims.

Two complementary methods were used to collect data on property owners’ perceptions. Semi-structured interviews were used to sample fewer subjects to a high level of contextual detail, with data from these forming the main basis for subsequent analysis. For supporting data, a questionnaire was used to sample more subjects (but with less detail and context). Both are described more fully below.

Data acquisition

Questionnaire

Three sets of closed-ended questions were asked. These can be found in Appendices A and B in the supplemental data online. One set of questions asked how respondents perceived financial parameters and factors directly influencing them (i.e. direct determinants of net operating income) to be affected by EC and environmental measures for a given building owned by their organization. Many questions asked the effect on these parameters in the long- and short-term respectively. Secondly, the questionnaire asked broadly about the degree to which EC and environmental measures for the building considered had been advantageous in relations with tenants, investors, with the local authority and internally in the organization. Thirdly the questionnaire asked how important specific environmental measures were for value creation.

Individuals were selected for the questionnaire target group in light of their ‘theoretical relevance’ (e.g. Miller & Salkind, 2002, p. 156), i.e. that they have direct experience of the phenomenon under investigation: EC from an owner perspective. The group therefore consisted of one representative (predominantly a building/environmental manager) for each identified non-residential building in Sweden that had been certified or preliminarily certified according to BREEAM, LEED or Miljöbyggnad and a small selection with experience applying the EU Green Building tool. In total there were representatives for 65 buildings. These representatives’ organizations are estimated to own in total about 30 million m² non-residential rentable space in Sweden, or about 20%
of the total. Responses were received between November 2012 and April 2013.

**Interviews**
A template-based semi-structured interview format was used (see Appendix A in the supplemental data online) containing open-ended questions grouped around certain themes: motives, drivers and strategies, prior expectations compared with experience, the role of specific environmental enhancements, communication and future directions. The template also included broad follow-up questions such as ‘… in what way?’ and ‘… can you illustrate with an example?’

The overall target group of potential interviewees was the same as that for the questionnaire (see above). Fifteen people were interviewed in total and their selection was based on achieving a variety in representation; different types of owner (private and public), building uses (office, healthcare, education, retail), EC tools (LEED, Miljöbyggnad, BREEAM including some that were also ‘double certified’ with EU Green Building), certification levels (from low levels to the very highest) and project type (new construction or existing building). Given the study’s qualitative approach, the assumed heterogeneity of interviewees’ experience was prioritized over direct comparability. New interviews were carried out for as long as it was considered that they were yielding important new information on the phenomena under investigation.

Each interview lasted as long as it was considered that they were yielding important new information to the study and lasted between one and two hours. They were in all cases audio-recorded in their entirety and carried out between February and June 2013.

**Data analysis and explanation development**
Analysis was performed in three steps. The aim of the first step was simply to present acquired data in such a way to facilitate further analysis. Accordingly, aggregated answer frequencies and distributions were derived from the questionnaire responses. Then for each interview a summary was transcribed and simultaneously classified according to descriptive codes (Miles & Huberman, 1994). The codes used were largely based on the structure of the interview template and the specific questions posed previously in the questionnaire. To be specific, coding was performed with a semantic and realist approach to the meanings of the interview data (e.g. Braun & Clarke, 2006).

The second analytical step aimed for an initial interpretation of data and centred around two questions. Firstly what particular aspects of EC and its application by property owners are noted for creating value? and, related, for each aspect identified according to the previous question, in what specific way (or ways) was the aspect seen to create value? It was noted in answering these questions what type of owners, for what types of buildings, EC tools, certification levels it is who are identifying areas for value creation, and the EC aspects doing so. For this second step, the authors of this paper read through coded interview transcripts and reviewed the aggregated questionnaire data. Potentially prevalent EC aspects and associated ways of creating value from this initial review were noted, with the notes being used as the basis for self-reflexive discussion amongst the authors of this paper, and also with members of the project’s reference group. Results of these discussions were also noted, and as part of this second stage, two further interviews were carried out.

In parallel, literature was sought (in Scopus and library catalogues) theorizing the relationship between environmental management (and similar initiatives) and achieving an organization’s overall strategic objectives. Search term combinations used included ‘environmental proactivity’, ‘environmental management’, ‘corporate social responsibility’ (CSR), ‘sustainability management’, ‘organizational performance’ and ‘financial performance’.

The results of the second step were then brought together in a third step. This final step asked how EC aspects and their related ways of creating value (identified from empirical data in the second step) could be organized according to categories and concepts used in theoretical explanations identified in the literature search. To answer this question, the main author composed conceptual maps with brief accompanying texts that were used as the basis for discussion with the other authors. Notes from these discussions were then applied by the main author for further refinement of proposed maps and texts.²

**Findings**
The major outcomes from the first and second steps of analysis described above are presented here. From the questionnaire target group, the number of complete responses were 30. One other questionnaire response was started but not completed. All others declined to answer. Firstly energy-related measures are identified from questionnaire results as having great influence on value creation. Table 1 shows that energy cost reduction is the cash flow area most affected of those considered. Many interview responses testified the same. Energy efficiency and associated lower operating costs were also noted by interviewees for affecting investment decisions in transactions. However, on the significance of just EC for energy cost reduction different opinions were raised in interviews. Some pointed out that such reductions are often achieved without EC itself, e.g. with corporate
energy policy. On the other hand, others suggested that the decision to aim for a certain EC level introduced an incentive to include measures that otherwise would not have been considered.

The issue of IEQ and documented choice of low-impact materials are perceived naturally by many owners as interlinked. Value creation from such measures was perceived in a number of ways, for example:

> Earlier there was a lot of hocus pocus. Now tenants are very well-informed and have requirements for ventilation flow, material choice, natural materials, linoleum and not plastic floor, recyclable products, e.g. furniture. (Private sector, interviewee 4)

> With good documentation [...] we could show on sale that the building was what we had ordered. (Private sector, interviewee 1)

Interviews raised some other interesting examples of value creation through certain specific measures. The developer of a retail property described how a store manager’s office had been moved to the front of the building to achieve day-lighting credits for Miljöbyggnad. This created value for the manager through improved contact with customers with the new office location. More generally this phenomenon points to how EC challenges accepted norms to stimulate creative solutions also noted in other environmental management literature (Epstein, Buhovac, & Yuthas, 2015; Hart, 1995). Meanwhile another interviewee reported that the creation of a rooftop meadow on a large city centre building (to attain BREEAM credit for biodiversity) had received a very positive response from future tenants.

Questionnaire results indicated that proximity to public transport hubs and services in general was the most important single environmental measure for value creation, followed by large-scale measures for energy efficiency and IEQ respectively. All types mentioned here were considered important by a large majority of questionnaire respondents. On the other hand, interview findings did not contain any confirmation that IEQ has an effect on productivity in any particular terms, such as reduced illness or absenteeism.

| Table 1 | Summary of the questionnaire results showing the perceived effect on direct economic factors of environmental certification (EC) |
|---------------------|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                     | Short/long timeframe | Lower | No noticeable difference | Higher | Do not know |
| **Operating income** |                    |       |                             |       |               |
| Rental rate (income/m²) | S                  | 0% (0)| 63% (19)                    | 20% (6)| 17% (5)        |
|                      | L                  | 4% (1)| 43% (12)                    | 39% (11)| 14% (4)        |
| Vacancy rate         | S                  | 20% (6)| 63% (19)                    | 0% (0) | 17% (5)        |
|                      | L                  | 41% (12)| 34% (10)                   | 7% (2) | 17% (5)        |
| **Operating expenses** |                  |       |                             |       |               |
| Tennant outfitting   | S                  | 6% (2)| 42% (13)                    | 29% (9)| 23% (7)        |
|                      | L                  | 10% (3)| 47% (14)                    | 23% (7)| 20% (6)        |
| Energy costs         | S                  | 83% (25)| 13% (4)                    | 0% (0) | 3% (1)         |
|                      | L                  | 86% (25)| 10% (3)                    | 0% (0) | 3% (1)         |
| Operation and maintenance | S                 | 35% (11)| 55% (17)                   | 3% (1) | 6% (2)         |
|                      | L                  | 47% (14)| 43% (13)                   | 7% (2) | 3% (1)         |
| Renovation and rebuild | S                  | 13% (4)| 65% (20)                    | 13% (4)| 10% (3)        |
|                      | L                  | 33% (10)| 40% (12)                   | 20% (6)| 7% (2)         |
| **Transaction aspects** |                |       |                             |       |               |
| Production cost      | n.a.               | 8% (2)| 12% (3)                     | 69% (18)| 12% (3)       |
| Sale price           | n.a.               | 0% (0)| 19% (6)                     | 65% (20)| 16% (5)       |

Note: Figures in parentheses are the actual number of respondents
hand, interviews and discussion with the project’s reference group suggested that the proximity question is *always* a key for value creation with or without environmental measures and EC. Therefore it is not considered further here.

Table 2 contains questionnaire results showing that EC is generally considered advantageous internally in organizations, with specific areas for advantage indicated in Table 3.

According to interviews, many organizations had taken strategic decisions on certification for all new construction, showing that EC enables a wide range of environmental issues to be brought to board level. A reason for this may be its importance in establishing an organization’s credibility and brand in environmental issues, as shown in Table 3.

A public developer noted that as a result of EC they were perceived as being at the forefront of the industry. Private developers meanwhile noted benefits from the significant local and national media coverage that many of the buildings considered generated. On other organizational levels, interview findings show that EC was judged to have made environmental work more rewarding, and increased its status in the organization. Survey results in Table 3 confirm this, with increased environmental expertise amongst staff. A noted effect of this according to one interviewee is that environmental issues are considered at project inception.

A way of quality assurance with high environmental performance. Earlier experience with e.g. consultants was that they filled in checklists about environmental choices and it was easy to take short cuts. (Public sector, interviewee 2)

[Quote 3]

According to questionnaire responses, EC was seen as attracting and retaining skilled employees as shown in Table 3 and in some organizations EC is important for recruitment as alluded to in interviews. Table 2 further shows the positive reactions from tenants. Interview findings confirm that the kind of tenants that owners want often include requirements for EC in leases:

> When building over 3000 square metres, one wants to lease to large companies, and most such have an environmental policy that requires certification. (Private sector, interviewee 6)

[Quote 4]

Other interviewees gave specific examples of winning development contracts where EC was important. Similar is shown in Table 2 for investors, confirmed by interview findings:

> It is important for property funds to demonstrate certified buildings amongst a portfolio. (Private sector, interviewee 4)

[Quote 5]

Finally, interview findings confirm that EC is advantageous in planning applications and winning...
development contracts on land owned by local authorities. This confirms the favour with local authorities shown in Table 2. These kinds of statements allude to the currency that the certification itself (besides the measures and processes undertaken to achieve it) has in a property owner’s relationship with important stakeholders.

Table 1 summarizes the effect that EC is considered to have on factors contributing to net operating income as well as financial aspects of transactions. Three items in the table show a high degree of consensus amongst respondents of a change due to EC: Energy cost (lower, short- and long-term, as discussed previously), sale price and production price (both higher). Interview findings suggest that the EC production premium was actually small. One owner reported the following concerning premium for production and sale (note the same interviewee as Quote 2):

A 5% increase in investment cost was assumed because of the environmental profile. In the event it was lower. (Private sector, interviewee 1)  

[Quote 6]

Profit on sale was higher than expected. (The highest certification according to a certain EC tool) was very important in the sales process. (Private sector, interviewee 1)  

[Quote 7]

These findings suggest that the production premium even for highly rated buildings is well within the 12% upper-bound established according to the recent review (World Green Building Council, 2013).

Meanwhile as shown in Table 1, there is broad consensus that rental rates and vacancy rates are not affected in the short-term. In the longer-term, about 50% see higher rental rates and lower vacancy rates. This suggests a competitive advantage for EC buildings in attracting tenants. One private owner mainly in the office market summed up market dynamics in this area well:

It is likely difficult to take a rental premium for a certified building, but uncertified may have to be discounted to attract tenants. The difference between brown buildings and green buildings will in time be noticeable. (Private sector, interviewee 7)  

[Quote 8]

For operation and maintenance (short- and long-term) and renovation and rebuild (long-term only) responses are similar because so few see a down-side in these items due to EC. Positive effects in these areas may relate to the higher quality (e.g. Quote 3) and documented choice of materials (Quote 1 and related text). EC was meanwhile generally perceived not to reduce costs for tenant outfitting, suggesting that this item is often considered alongside production price, as commanding a premium for associated environmental measures.

Explaining perceived value creation

Strategy map

Figure 1 shows a schematic ‘strategy map’ that is a key outcome of the third step of analysis as described in the Method section. Its structure aims to provide a context and theoretical explanation of the way in which value is created through EC, and what specific features of EC are important. The structure is derived from the two existing approaches considered most relevant in the literature sought (see the Methods above). The arrangement into headings on the top of the map is based on Epstein and Rejc’s (2014) ‘corporate sustainability model’ and related ‘strategy map’. ‘Actions’ refer to those specific activities that the organization carries out to achieve desired outputs and outcomes. In the original conception these refer to such areas as strategy, goal-setting, leadership and implementation. As shown in the figure, here they refer to the various ‘actions’ the organization must carry out for certification. These actions are aimed towards ‘outputs’, which are performance goals that though strategically significant are measured in non-financial terms. These outputs are then the basis for contributing to outcomes, which are those financial goals established for the organization. Note also the feedback loops connecting outputs and outcomes back to actions. This demonstrates that achieving desired outputs and outcomes themselves are important for providing the basis by which the organization carries out desired actions.

The second theoretical starting point for the model structure is the balanced scorecard (BSC). BSC is a performance measurement approach first proposed by Kaplan and Norton (1992) to address the problem that stating goals and measuring performance in terms of financial metrics alone was not sufficient to ensure long-term stable profit for that organization. According to BSC, the organization establishes goals and measures performance based on four perspectives. Firstly the financial, secondly the external stakeholder perspective (for property owners these may be tenants, investors, buyers, local authority, residents), thirdly the internal perspective (considering the organization’s day-to-day management processes on a strategic level, amongst employees internally, but also on issues such as maintenance and regulatory compliance) and fourthly the ‘learning and growth’ perspective (highlighting the organization’s intangible capital such as employee knowledge and skills and their possibility for training and changing to meet future needs). Figure 1 uses letters a–d to indicate which perspective(s) of the BSC approach outlined here are most relevant for each of the outputs and outcomes identified.
Bridging from the aforementioned structure of the map in Figure 1 to the empirical findings it summarizes, the ‘actions’ entailed by aiming for EC are presented in three parts. Firstly, to achieve the indicator requirements of any given EC tool it is necessary to carry out what are called here ‘environmental measures’. A second action in Figure 1, the ‘EC process’, is the establishment of clear requirements that function as firm and coordinated goals and sub-goals and improving communication for environmental (and quality) steering in development projects or in supporting environmental management in existing buildings. The final ‘action’ shown in Figure 1 is that of ‘EC certification’ itself. Each of these value creating actions is potentially mutually supportive of at least one other, hence reciprocal arrows between each one in Figure 1.

Each action in Figure 1 is connected with outputs and outcomes indicating the causal connections for value creation according to the study’s findings. It does not include connections proposed e.g. in reviewed literature. Given the sample selection it does represent opinions of owners significant for EC in Sweden, and these connections should be interpreted as being descriptive of them in general, potentially illustrative of others but not normative.

One example of such a connection shown in Figure 1 is the satisfaction of desirable tenants leading to improved rental income. To recap, Table 1 shows that rental and vacancy rates are perceived to be more favourable due to EC in the long-term more than in the short-term. The BSC explanation of these perceptions is therefore that EC activities performed by owners now are seen as strategic market positioning, and that these actions affect the external stakeholder perspective now (‘c’ in Figure 1) but are pursued on the presumption that they will affect financial balance sheets (‘a’) more in later reporting periods.
Some connections are notable by their absence from Figure 1. No particular connection is made according to findings between IEQ and material choice on the one hand and improved occupant health on the other. Also, though productivity improvement as a result of environmental enhancements is widely reported in literature (Kats et al., 2010; World Green Building Council, 2013), it was not significant in property owners’ perceptions here. This may be because Swedish code already mandates higher performance for, for example, daylighting and ventilation rates than in the US where the majority of productivity studies have been performed. Productivity is furthermore primarily a concern for users and tenants rather than owners. Therefore, it is possible that the demand for certain air quality features, elimination of hazardous materials noted in the findings is evidence that tenants perceive their importance in productivity terms even if they (or their landlords as evidenced here) do not actually measure their effect. A further issue that may explain this finding is that LEED and BREEAM award credit based on design performance, which they do not need to achieve in actual performance (e.g. Nelson & Frankel, 2012; Tuohy & Murphy, 2015) and often do not.

Also based on the findings, water-related measures are absent from Figure 1 probably because water is not scarce in Sweden in the same way as it is in the US and as reflected by the LEED tool. Furthermore, although questionnaire respondents were in general positive about overall building quality and its effect on future maintenance costs they did not identify specific features in this respect such as durability or recyclability, hence they are not included.

Indeed, although low energy demand seemed key for value creation according to the findings, many interviewees noted that this was ensured by an energy management system or similar and not EC. One possible reason for stressing this in an organization is that LEED and BREEAM rely on design performance and not measured performance and are therefore not sufficient to ensure low energy performance in use (e.g. Tuohy & Murphy, 2015). Indeed, significant value creation in this area may be achieved without these EC tools, rather with well-managed building documentation, energy performance certificate and performance assessment in use. In contrast to LEED and BREEAM, certification according to Miljöbyggnad is done based on performance after two years of operation.

On another note, the reciprocal arrows between ‘EC certification’, ‘EC process’ and ‘EC measures’ highlight that each of these arguably separate actions is mutually supportive of the others. However, this is not necessarily so. The output and outcomes resulting from ‘EC certification’ demonstrated in Figure 1 may allow for value creation through green-washing especially if credits awarded on a design basis for measures necessary for certification are not fulfilled in use (perhaps with insufficient attention to the process). The strategy map shown is also principally concerned with demonstrating and identifying areas where property owners do perceive value creation, though it does not preclude or negate the fact that EC incurs costs as noted in the findings above, that other theories of value would yield different explanations, or that value may be created without notably improved environmental performance (i.e. greenwashing). Indeed, the research approach used here does not formally refute that there may be property owners who have legitimate reasons for not perceiving value creation from EC at all.

Explaining perceived value creation using the strategy map structure of Figure 1 challenges researchers and property owners alike to evaluate EC value creation using methods besides those permitted by valuation heuristics (e.g. Warren-Myers, 2012). Epstein and Rejc (2014) recommend that organizations should measure performance in all the causal connections identified in a strategy map such as that shown in Figure 1. These could be done with methods that property owners may use already, such as tenant satisfaction surveys (undertaken by 52% of GRESB members in 2014; GRESB, 2015) and reputational audits, but which are little-reported in the valuation-based literature.

Strategic priorities for different owner types

Strategic priorities for different owner types were determined as part of the second step of qualitative analysis (see the Method above). Two notable ideal types by which to distinguish organizations with well-developed strategies in applying EC were developed to explain heterogeneities amongst interviewed owners – ‘market leaders’ and ‘service leaders’. They have in common that both have established internal expertise in environmental management in general and more specifically EC, and have prioritized organizational resources in terms of time and money in order to do it. They also have a demonstrated commitment to environmental management from the highest strategic level in the organization. This is why they are both considered leaders.

According to the interviewed ‘market leaders’ EC is a strategic means of creating competitive advantage to attract desirable tenants and in transactions, affecting total rental incomes and price on sale. It is primarily private owners (Swedish or international) focussed on office buildings in large urban areas that tend to this ideal type. ‘Market leaders’ have much of their building stock in highly competitive markets (in terms of investors and tenants) and maximization of quarterly profit is a high priority. Interviews and public documents consulted show that these organizations have a preference for international tools, such as LEED and BREEAM. Some of these organizations pointed out in the interviews...
that this is mainly because the tools are more well-known internationally and important for branding and creating competitive advantage. ‘Market leaders’ may be amongst those organizations (noted by Hart, 1995) to be strategically pushing certification bodies for more ambitious ratings standards in EC tools, because so doing accentuates the desired competitive advantage. Also in this dynamic can be perceived an aspect of long-term strategy reflecting the different perceptions of long- and short-term advantage shown in Table 1.

Amongst ‘service leaders’ are organizations that are principally run according to political requirements or as a result of the fact that the organization in question is expected to fulfill societal goals and intentions in general. Amongst this group value creation arises principally in the form of a better process through applying EC (see ‘EC process’ in Figure 1 and the accompanying text). This advantage may result in higher building quality, and better response to tenant concerns during building operation, both of which may further yield cost and competitive advantages. Typically these organizations are Swedish and publicly owned and operated, with buildings used for functions other than office space (i.e. healthcare, education and retail) though not always, e.g. cooperatively owned organizations. This category seems to favour Miljöbyggnad. This may ultimately be because for ‘service leaders’ it is not necessary to appeal to foreign tenants or investors with internationally known tools. Meanwhile, Miljöbyggnad with only 15 indicators assessed on performance (not design as for LEED and BREEAM) and related to standard Swedish code may also be better suited for value creation related to EC process (Figure 1). Indeed, Miljöbyggnad’s most significant current achievement from a policy perspective maybe is that it has made inclusion and communication of environmental objectives in development projects easier and more rewarding for those that have adopted it. Though its application is rapidly becoming a norm for owners such as ‘service leaders’, it is still far from substantively affecting achievement of the national environmental objectives (Swedish Environmental Protection Agency, 2012).

There is also a largely heterogeneous third ideal type, defined only by the fact that they do not have such well-expressed strategic motives for applying EC. The group exhibits diverse types of ownership – for-profit cooperative, public organization and small private owner – with seemingly divergent priorities in terms of value creation. It may be that such owners were interviewed whilst still in the process of developing a strategy for EC application for their organization.

Research limitations
A starting point for the research design was that EC’s popularity amongst Swedish owners at the time of data acquisition for this study implied that it was perceived as creating value in some way by those owners. Owner perceptions and thus this study are important because it is owners that drive the real estate market. Nevertheless, this focus on owner perception did also limit findings and proposed explanations, and EC may create value in a general sense in ways not found here. The social return on investment (SROI) approach (Nicholls, Lawlor, Neitzert, & Goodspeed, 2012), for example, aims to monetize and sum the effect that a certain action has on a broad range of stakeholders that was not considered in this project (or noted by respondents). This approach could nevertheless be interesting for public or CSR-minded private owners as well as policy makers. The findings here also largely ignore the value in potentially reduced environmental impacts from EC application. Such could be ascertained for example with a monetized life cycle assessment method, e.g. Ecowalue (Finnveden, Håkansson, & Noring, 2013).

Research design considerations may also have led to an absence of stronger criticisms of EC in the findings. For example, no EC tool currently awards credit based on ‘objective’ sustainability measures, e.g. the planetary boundaries (Steffen et al., 2015) or even the Swedish environmental quality objectives. Therefore it is questionable how sustainable EC buildings currently are. Nevertheless having reframed the value creation debate in terms of strategic management in this study, future studies may ask what property management strategies create the most value when aiming to achieve environmental performance levels established in light of, for example, the planetary boundaries or the Swedish environmental quality objectives.

Finally, as with all empirical studies, quantitative or qualitative, this work makes basic assumptions about the credibility and trustworthiness of data sources. All data in this study were gathered on the condition of anonymous reporting, though an unconscious tendency for self-justificatory and overly optimistic responses may still exist. Nevertheless, no separate questionnaire or interview response was uniformly and strongly optimistic (or pessimistic for that matter), and indeed though variation is noted amongst different responses, none were so markedly different from others in this study or from previous literature to suggest a non-credible testimony.

Conclusions
The ‘strategy map’ approach to value creation from EC (applying perspectives of the Balanced Scorecard) that has been developed in this study complements the existing literature referencing principally the valuation profession’s heuristics. The approach in general challenges property owners to evaluate EC in terms of its contribution to long-term strategy, measuring it according to financial and non-financial metrics of performance.
The study also shows that differences between profit-maximizing and public owners imply different strategic priorities through EC. For owners already engaged in tenant and employee satisfaction surveys and reputational surveys, future research could complement the qualitative approach here by investigating and comparing what effect EC is actually having in these organizations according to these or other measurement techniques. It is also relevant for researchers and owners to ask if new techniques or indicators are needed to better evaluate the effect of EC initiatives.

The study confirmed that tenant demand is an important EC driver for property owners (in particular in large organizations) and therefore that increased awareness of EC amongst tenants is important for EC and for further value creation. Tenant perception of value creation is indeed the subject of a forthcoming companion study to this one.

The study also demonstrated that building material inventories established to gain EC credit can be an important factor in successful transactions. This suggests that tool developers, EC-inclined property owners and valuers could all benefit from more closely aligning valuers’ documentation requirements (e.g. RICS, 2013) with those for accreditation with EC tools. New research could identify which areas in the assessments could most easily be aligned.

Findings showed that many owners apply energy management programmes in addition to EC, and that tenant productivity was not considered a key area for value creation from EC. Both may depend on noted performance gap issues when applying EC. On the other hand, the latter may be due to the fact that tenants implicitly acknowledge the possibility of productivity improvement through noted IEQ requirements on leasing. Future research may ask if productivity improvements due to EC in Sweden are significant since IEQ in code compliant Swedish buildings is better than in the US where the majority of such studies have been done.

Finally, reconceiving value creation in terms of strategic management opens up the field to be able to consider a very central but as yet exploratory theoretical question in the transition to sustainable development, namely how can value be created in the real estate sector simultaneously with observing absolute measures of sustainability according to, for example, the planetary boundaries.

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Supplemental data

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Endnote

1‘Brown building’ is a direct translation of the interviewee’s Swedish expression ‘bruna hus’ and is a colloquial term referring to a non-EC building.

2Questionnaire and interview results alongside preliminary theoretical explanations are available in two reports available free-of-charge online and a conference paper (Brown, Malmqvist, & Wintzell, 2014a, 2014b, 2014c).