Value creation for tenants in environmentally certified buildings

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ABSTRACT
Previous research suggests that environmental certification (EC) affects rental rates in non-residential buildings, but there is still little understanding of how tenants differentiate such buildings from those without EC. This paper examines whether and how tenants perceive value creation in EC premises in Sweden. The findings (based on 29 questionnaire responses and 14 interviews with tenants in EC buildings) inform landlords and tenants on the development of EC strategies for improved organizational outcomes. EC creates value for tenants principally as support for their environmental management and reporting (e.g., low energy demand). EC is important for tenants internally, raising employee environmental awareness and improving employee attraction and retention. Tenants are generally positive about employee morale, indoor environmental quality (IEQ) and rental costs. However, it is not clear if such perceptions are dependent on features of modern premises in general, such as new fixtures, fittings and furnishings, and space-efficiency or from some EC-related feature. Tenants do not identify health or productivity increase in their EC premises. Findings suggest that the research focus should be shifted from investigating health and productivity increases through IEQ improvement to understanding the motivational improvement through value alignment with employees through EC.

KEYWORDS
buildings; environmental certification; environmental management; landlords; tenants; value creation; workplace

Introduction
Particularly in post-industrial economies, buildings constitute a significant portion of manufactured capital (e.g., Pearce, 2003). Meanwhile, building operation globally accounts for nearly one-third of final energy consumption and energy-related greenhouse gas emissions respectively (International Energy Agency (IEA), 2013). Therefore, decisions made by building owners and the preferences of their tenants will significantly affect contemporary society’s successful transition to sustainability. One industry-driven initiative aimed at mitigating buildings’ environmental impacts over the past two decades has been the development and diffusion of environmental certification (EC) tools, where the British BREEAM tool and the US LEED tool and are amongst the earliest and most widely applied. The past 15 years have seen much work theorizing and investigating how initiatives for achieving high environmental performance (with or without EC tools) affect a building’s value (for a summary of the current thinking on the issue, see, for example, World Green Building Council, 2013).

Early research in the field used theoretical assumptions and valuation heuristics to illustrate the potential for increase rental rates in EC buildings. With this approach, Boyd (2006) argues that EC buildings may command a rental premium of up to 8% and increased rental growth rate of up to 13%. Ellison and Sayce (2006) also assume that a higher rental growth may be achieved based on the lower energy demand for EC buildings. However, as Warren-Myers (2012) notes, these theoretical studies did not provide evidence of rental premiums based on real transaction data.

Later industry surveys showed that many tenants (between 40% and 70% depending on the survey) were willing to pay more to rent premises in a sustainable building (Atis Real, 2008; Cushman & Wakefield, 2009; Dixon, Ennis-Reynolds, Roberts, & Sims, 2009; Jones Lang LaSalle, 2008). Such studies are also limited because they only provide evidence of good intentions and not real actions. Hedonic studies have shown that higher effective rents are possible from EC buildings by up to as much as 29% (according to Fuerst & McAllister, 2011, for buildings with both LEED and EnergyStar...
certifications), though other studies have found no noticeable difference (Eichholtz, Kok, & Quigley, 2010). Warren-Myers (2012) further comments that such studies may be of little benefit because the hedonic methods used make results dependent on factors subjective to the researcher. These studies, though interesting, have thus not managed to establish unequivocally the connection between EC and rental premiums.

A related question is what value might tenants perceive in premises in an EC building that could motivate them to pay higher rents? In its most broad sense, answers revolve around the fact that tenants perceive advantages from EC premises that they do not get from other buildings, i.e., they are differentiated. Previous research has demonstrated in general that working actively with sustainability aspects supports achievement of other organizational objectives, for example the response of external stakeholders (Albertini, 2013; Hart, 1995; López-Gamero, Molina-Azorín, & Claver-Cortès, 2009; Sambasivan, Bah, & Ho, 2013).

Meanwhile, different contributing and competing explanations have been proposed specifically for tenant differentiation of EC buildings. Reduced energy costs due to EC, where tenants may take a cut, have been identified by many (e.g., Boyd & Kimmet, 2005; Kats, Braman, & James, 2010; Lützkendorf & Lorenz, 2007; Royal Institution of Chartered Surveyors (RICS), 2005). Other reasons are that buildings with environmental enhancements improve the overall experience for building users. For example, it has been shown that they improve perceived thermal comfort, air quality and lighting conditions compared with more conventional buildings (Baird, Leaman, & Thompson, 2012). Leder, Newsham, Veitch, Mancini, and Charles (2016) showed that satisfaction with many indoor environmental quality (IEQ) parameters was actually higher amongst users in ‘green’ (mainly LEED-certified and -registered) office buildings than it was in comparable conventional buildings, even though there could not be shown to be any substantive differences in the major physical measures of IEQ between the two samples. Kats et al. (2010) reviewed over 40 studies investigating the relationship between different sustainability-related enhancements (e.g., improved air quality and access to natural environments) and various health-related outcomes (certain medical symptoms, visits to the doctor, etc.). Average reduction of symptoms and other negative outcomes across all these studies was about 40%. They also note higher user productivity in buildings according to over 30 studies, with an average improvement across the studies of 3.2%. Indicative calculations of monetized health and productivity benefits in the same study are used to argue that the worth of such benefits can be on the same order of magnitude and potentially greater than cost reductions for energy and water (Kats et al., 2010).

Furthermore, recent research shows that an organization’s corporate social responsibility initiatives can positively impact employees’ dedication to their work, known as ‘organizational commitment’ or ‘organizational citizenship’ (Choi & Yu, 2014). Baird et al. (2012) also found that self-reported productivity was higher by up to 8% in buildings with sustainable features compared with a ‘not-particularly sustainable’ control group. In contrast, McCunn and Gifford (2012) found that enhanced sustainability features in a building did not yield increased ‘employee engagement’; and Newsham et al. (2013) found no difference in organizational commitment between employees of tenants in ‘green’ (mainly LEED-certified and -registered) office buildings compared with comparable conventional ones. Sustainable management initiatives in general have also been linked to employee-related factors in organizations such as improved organizational learning (Sambasivan et al., 2013) and interpersonal contacts (Delmas & Pekovic, 2013). Turban and Greening (1997) showed that active corporate social responsibility work also increased the attractiveness of organizations for potential employees. Meanwhile a global industry survey of 18–35 year olds (‘generation Y’) found that nearly all of them wanted their physical place of work to go beyond compliance with compulsory environmental performance regulations (Haynes, 2011; Puybaraud et al., 2010).

A few papers connect tenant preferences for EC with improved external relations. Robinson (2005), for example, notes that ING Bank in the Netherlands obtained an increased market share on the basis of a new headquarters with high sustainability performance, though does not delve deeper into how this arose. Eichholtz, Kok, and Quigley (2009a) meanwhile found in a large-n statistical study that organizations with large direct environmental impacts (e.g., fossil fuel companies) are more likely than others to locate in EC buildings.

Summing up, it has been shown that active sustainability-oriented initiatives, under the right circumstances, can create value for tenants. There is also an expansive literature exploring value creation from EC buildings from the perspective of property owners and investors (e.g., Sayce, Sundberg, & Clements, 2010; Warren-Myers, 2012). In contrast, empirical studies of value creation from the tenant’s perspective are fewer.

EC for buildings has in recent years become popular in Sweden, after the inception of the third-party
Increased pro-
Ammenberg (2004), it is assumed that improved stake-
holder relations and reactions in a general sense are
achieved credit according to the EC tools considered in
building and premises features implemented to
buildings. These questions
value creation perceptions compare and contrast with
those of owners. These questions fill a research gap
about tenants’ strategic priorities when hiring premises
in EC buildings.

Value and value creation are central ideas in property valuation (e.g., IVSC, 2013) and economics in general (Varoufakis, Halevi, & Theocarakis, 2010). Value is considered here to be created for a tenant by anything that the tenant perceives as making a contribution to their particular organization’s objectives. Some starting points on strategic value creation in organizations from environmental management literature were considered. Firstly, it is assumed, based on the ‘causality of sustain-
ability performance drivers’ established by Epstein and Rejc (2014), and the basic form of the balanced scorecard for strategic management (Kaplan & Norton, 1992), that increased profit as a result of lower costs and increased revenues is a value-creating organizational objective. Secondly, based on the previous two studies and from Ammenberg (2004), it is assumed that improved stake-
holder relations and reactions in a general sense are also value-creating organizational objectives. The term ‘environmental enhancements’ is used broadly to refer to building and premises features implemented to achieve credit according to the EC tools considered in the study.

Methods
The aims noted above are achieved here by exploring and proposing new potential explanations for the phenom-
enon under investigation. It was not intended to hypothe-
tico-deductively prove or disprove specific explanations. A qualitative analytic approach was therefore adopted, with

A web-based questionnaire (allowing for a larger sample and control over research questions; e.g., Marshall & Ross-
man, 1995) and qualitative semi-structured interviews (for highly detailed context specific information, see Marshall and Rossman, 1995).

Questionnaire
The questionnaire used four sets of closed-ended ques-
tions (see also the supplemental data online). The first
two sets asked questions about the effect of EC and
environmental enhancements on tenants’ total premises
costs and tenants’ important stakeholders (primarily
tenant employees as building users, but also clients,
investors, internally, landlords and public authorities)
respectively. Thirdly, tenants were asked about the
importance of specific environmental enhancements
for value creation from their perspective. Finally, they
were asked about the role they had in the building owners’
decision to certify and the extent to which EC had
been a factor in choosing their specific premises. Themes
for potential value creation taken up in the questionnaire
were based on the literature review referred to above as
well as in dialogue with a reference group of property
owners.

To ensure theoretical relevance for the questionnaire’s
target group (e.g., Miller & Salkind, 2002), appropriate
respondents needed to have experience of the decision-
making process in contractual discussions with potential
and actual landlords. A second criterion was that the
respondent should have direct personal experience of
using a premises in an EC building. A list of buildings
certified with either Miljöbyggnad, LEED or BREEAM
current for the time of the survey (summer 2013) was
procured from the SGBC. A few buildings certified with
the energy rating European Union Green Building
were also included. Specific respondents were found
using internet search engines and personal contact by
e-mail and telephone.

A list of 55 potential respondents was created. It was
dominated by tenants in office buildings in the largest
Swedish cities Stockholm, Gothenburg, Malmö and uni-
versity-centred growth towns Uppsala and Lund. This is
largely representative of the way that EC has been
applied in Sweden so far. Nevertheless, other types of
tenants were also included, for example, buildings used
for logistics, education, museums, retail as well as build-
ings from smaller towns. All types of EC tools considered
in the study were present. Tenant-owners, including
many public hospital organizations, were not included
since they had previously been contacted in a part of
the same project focused on building owners. Responses
were received between August and October 2013.
Interviews

A template was used in carrying out semi-structured interviews (see the supplemental data online) containing open-ended questions grouped around certain themes: motive and driving forces for EC; expected and experienced value creation; and communication of EC. According to the template, broad follow-up questions were posed where necessary, such as ‘... in what way?’ and ‘... can you illustrate with an example?’

The target group for the interviews was essentially the same as that for the questionnaire. Fourteen people were interviewed in total. As a qualitative study, in the selection of specific interviewees attention was paid to achieving a sufficient heterogeneity of interviewee experience as opposed to direct comparability. Therefore, selected interviewees represented tenants with operations in different areas (including private businesses, non-profits and public institutions) with different sizes of premises and in different geographic locations (though interviewees were mostly office tenants in Greater Stockholm/Malmö/Gothenburg, according to the discussion given for the questionnaire above).

Each interview was carried out for as long as it was considered to be yielding new information. In general they each lasted for between 45 and 90 minutes, though some were shorter due to lack of information. Interviews were audio-recorded in their entirety and either carried out by telephone or in person between October 2013 and April 2014.

Data analysis

Summaries of each interview were transcribed and simultaneously classified according to descriptive codes (Miles & Huberman, 1994). The codes were grouped in four areas related to the notion of value creation used: the effects on tenants’ premises related costs; the effects on tenants’ external relations; the effects on tenants’ internal relations; and the effects related to specific environmental enhancements. As a small-n questionnaire, responses were analysed in terms of raw aggregated answer frequencies and distributions, without extended statistical analysis.

In the second analytical step, acquired and transcribed data from the above were interpreted from the perspective of questions directly related to the research aims outlined above. Firstly: What specific examples of value creation arise in the data that are clearly and specifically attributable to EC and environmental enhancements in the tenant’s premises? Conversely: What specific examples arise in the data where value creation due to EC and environmental enhancements does not arise in spite of previous findings suggesting that it does? Also asked was: How do interviewees differ in terms of their driving forces for renting EC premises? Also: What similarities and differences can be identified amongst interviewee organizations with similar driving forces? Public environmental reports and similar documents from the contacted organizations were also sought and reviewed. From these sources each researcher (the authors of this paper) noted specific instances answering the questions posed above. These notes formed the basis for a self-reflexive discussion amongst the research group and also with members of the project’s reference group.

Additional context was provided in this process by simultaneously referring to results of two separate in-depth surveys performed related to a large EC office building in a large metropolitan area (building I) (Table 1) where we had interviewed tenants in the current study’s main empirical investigation. These surveys were carried out as part of the research project of which the current study is also part. One survey was an IEQ questionnaire survey of building users. The other evaluated the change in environmental impacts for a particular tenant (interviewee A) before and after moving to a new premises in the EC building in question. Finally, general outcomes were compared with a study of property owners that had been carried out as part of the same project as this one (Brown, Malmqvist, & Wintzell, 2015).

Tenants’ value creation perceptions

This section presents general findings concerning those areas that were (and were not) perceived for value creation from EC. Twenty-nine complete questionnaire responses were received (a 53% response rate; see also the list of questionnaire respondents in the supplemental data online). Table 1 shows information about interviewees; Table 2 summarizes the results of the coding used to derive findings from interviews. Note that Table 2 records instances where the defined code occurred in an interviewee’s statements, including instances both confirming and disconfirming value creation.

EC’s effect on premises and energy costs

Figure 1(b) shows that a large majority of respondents ‘don’t know’ how total premises costs and premises energy costs are affected by EC and environmental enhancements, despite the fact that most questionnaire respondents have a direct economic incentive for a low energy use, shown in Figure 1(a). This corroborates previous observations of this phenomenon from a recent Swedish industry study (Fastighetsägarna, 2012) and the World Green Building Council (2013). The four
| Interviewee reference | Building reference | Respondents’ role in the tenant’s organization | Tenant’s sector | Type of premises | EC tool | Location | Driving force (our designation) | Move-in year |
|-----------------------|--------------------|----------------------------------------------|----------------|-----------------|---------|----------|-------------------------------|--------------|
| A                     | I                  | Property manager                             | Media          | Office          | Miljöbyggnad | Large city | Desirable specification        | 2010         |
| B                     | II                 | Manager sustainable building business unit   | Energy, infrastructure and related consulting | Office          | Miljöbyggnad | Large city | Mandatory specification        | 2008         |
| C                     | III                | ISO and environmental coordinator            | General business services | Office          | LEED     | Large city | Desirable specification        | 2010         |
| D                     | IV                 | Property manager                             | Energy, infrastructure and related consulting | Office          | Miljöbyggnad | Large city | Mandatory specification        | 2012         |
| E                     | V                  | Manager service unit                          | Non-profit     | Office          | Miljöbyggnad | Large city | Unaware                        | 2011         |
| F                     | II                 | Office manager                               | Business administration services | Office          | Miljöbyggnad | Large city | Desirable specification        | 2008         |
| G                     | VI                 | Director of environmental affairs            | Energy, infrastructure and related consulting | Office          | EU Green Building | Other | Unaware                        | 2012         |
| H                     | VII                | Director of environmental affairs            | Manufacturing  | Office          | LEED     | Large city | Mandatory specification        | 2010         |
| I                     | I                  | Chief financial officer                      | Information technology | Office          | Miljöbyggnad | Large city | Desirable specification        | 2010         |
| J                     | VIII               | Head of premises division                    | Public authority | Office/other public administration | LEED | Other | Unaware                        | 2011         |
| K                     | IX                 | Procurement and property manager             | Public authority | Office          | LEED     | Large city | Unaware                        | 2010         |
| L                     | X                  | Head of quality and environmental affairs    | Business administration services | Office          | BREEAM   | Large city | Mandatory specification        | 2012         |
| M                     | IX                 | Building manager                             | Public authority | Office          | LEED     | Large city | Unaware                        | 2010         |
| N                     | XI                 | Bursar                                       | Higher education, public authority | Higher education | Miljöbyggnad | Other | Mandatory specification        | 2010         |

*Note:* The column marked ‘location’ is either a large city (*i.e.* Stockholm, Gothenburg or Malmö) or ‘other’, *i.e.* none of the three aforementioned cities. The column marked ‘driving force’ is the designation of the research group in the light of observed interview responses.
interviewees mentioning energy costs (code LKEn) explicitly are all openly positive about the low energy costs in their EC premises, e.g. interviewee C (Table 1):

Rent is 20% higher compared to previous premises. We win that back on reduced energy costs. 240 MWh in previous premises compared with 193 MWh now.  

(quote 1)

Table 2 also shows that many more interviewees mention energy-related enhancements in their premises (code MSEn). Some describe particular enhancements (e.g., ice-cooling, heat recovery from lift shafts). Interviewees L and G noted that they had not actually achieved lower energy demand, in the case of interviewee G due to poorly functioning mechanical and electrical systems. Five interviewees (A, B, D, I) noted lower total premises costs (code LKTot in Table 2) compared with previously after moving to an EC premises. They also all noted factors not directly attributable to EC as playing a role

Table 2. Summary table of coded interview results.
in this (code LKÖv), e.g., co-locating business units previously in separate locations (A, B, D) or lower floor area per employee (B, D, I) as a result of an open landscape office (B, D). For example, interviewee D:

We have saved 40 million SEK/year through moving. A lot was saved by co-locating three previously separate offices... we now have smaller and more energy-efficient space. Previously we had 35 m² per employee, now under 20.

(quotation 2)

Interviewee F noted higher total premises costs (code LKTot in Table 2) in their EC premises compared with previously because of locating in a newly built building; interviewee E noted higher premises costs for a smaller area without identifying a reason; and interviewee C’s position is summed up by quotation 1. Interviewee G noted lower rent in their EC premises compared with comparable premises (not their old premises).

Interviewee H noted that though EC was a mandatory specification, they would never pay more for it. Interviewee D noted the same:

If asked the question ‘what premium are you prepared to pay for a low energy demand in your premises?’ in 2008 we may have answered ‘we could possibly discuss paying a premium’, in 2009 ‘we would definitely not pay a premium’ and in 2010 ‘it is not possible (for a landlord) to rent out a building that is not environmentally certified’.

(quotation 3)

**EC’s effect on tenants’ staff and other occupiers**

Figure 2(a) shows that more tenants perceive advantage internally than externally through their EC premises. Figure 3 also shows that tenants prioritize internal communication of their premises EC over external. Figure 4 shows that many tenants perceive a positive effect on employees in terms of environmental awareness. Interviewees A, C and D were most effusive with examples of environmentally aware behaviour after moving to the new premises, e.g. interviewee D:

Bicycle garage was initially dimensioned for 200 bikes, now 400 employees are cycling.

(quotation 4)

Interviewees L and M mentioned the effect on environmental awareness though did not give examples. Meanwhile interviewee J noted their organization needed to work harder to communicate their environmental work to their employees. Finally, interviewee F responded flatly ‘no’ the question of whether environmental awareness had changed as a result of their EC premises.

However, most significantly, interviewee C noted in a comment to the question shown in Figure 4 that the building’s EC had inspired top management to follow through with their plans for an ISO 14001-certified environmental management system for the local organization.

Figure 4 also shows that almost 70% of questionnaire respondents were neutral or positive to the effect on the
building's IEQ. Interviewees B–J and L were largely positive about IEQ in their new premises (code MSIEQ). This covered many different areas, including thermal comfort (I), air quality (H), lighting and sound environment (F, I). On the other hand, interviewees C and L also mentioned that their previous premises had had notably sub-standard IEQ. Their reactions are therefore very likely a comparison between their new and old premises, and not a reaction to some specifically EC-related feature in the new premises.

Most of the interviewees that were generally positive about IEQ also noted aspects (presumably more minor) that did not work so well, such as poor air quality after a long meeting in a full conference room (D), or

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**Figure 2.** Questionnaire responses: (a) To what degree do tenants perceive that the fact that renting premises in an EC building is advantageous in relations with the stakeholders shown?; and (b) How do relations with their landlord are affected by the building’s EC and environmental enhancements? Y-axes show the number of responses.

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**Figure 3.** Questionnaire responses: To what degree have you communicated to the following stakeholders that your premises are in an EC building with environmental enhancements? The number of respondents is on the Y-axis. Up to 29 respondents in total, including 'don’t know'.
automatic blinds triggered by indoor temperature and not by direct sunlight (I). In stark contrast, interviewee A was very dissatisfied with IEQ, giving multiple examples such as problems with thermal comfort, high indoor CO₂ concentrations, noise and ventilation operating hours poorly suited to their needs. This was also the tenant with whom an in-depth occupant case study concerning IEQ and premises-related environmental performance was carried out. One finding here showed that this particular tenant had a very high number of employees per unit area in their premises, which could clearly affect employees’ IEQ perceptions. Interestingly, interviewee I has premises in the same building (Table 1) and was largely positive about IEQ. Interviewee N was also dissatisfied with IEQ, and identified complicated and poorly functioning mechanical and electrical installations as a cause. Meanwhile only three interviewees (A, D, N) note the active choice of material, including material with low emissions (codes MSmat and MSLE). One more pointed out explicitly that they made no material specifications (J) in procurement. Figure 4 also shows that questionnaire respondents either perceive no difference or don’t know with respect to EC and environmental enhancements’ effect on staff’s general level of health, sick leave or productivity. Interviewees A, B, D and E all responded flatly ‘no’ to the question of whether productivity had improved in their EC premises (code ReProd). These findings suggest that the health- and productivity-related benefits summarized by Kats et al. (2010) and the World Green Building Council (WGBC) (2013) are not perceived as significant by Swedish tenants.

Figure 4 does show, on the other hand, that questionnaire respondents are somewhat more inclined to perceive a positive effect on workplace morale. Ten interviewees mention a change in workplace morale in their EC premises (code ReTriv). Underlying such responses is, for example, a sense of pride with respect to the premises’ EC (interviewee A, B), or findings from an employee survey (interviewee I). Again, however, these responses were in many cases found to be connected to factors other than the premises’ EC (code MSIcke), e.g. attractive common spaces (interviewees E, L), a well-designed open-plan office space (interviewee D) or that many previously separate business units have moved to the same premises (interviewee H). Interviewee A said that the perception of poor IEQ in the premises affected workplace morale negatively. Interviewee D noted an increased creativity related to moving to and open-plan office (code ReKrea – though interviewee B noted the opposite – disturbance from nearby employees). Meanwhile interviewee E noted the positive effect on creativity from their new attractive common spaces (i.e., MSIcke). This is thus another building-related benefit that cannot be clearly seen to be directly attributable to a premises’ EC.

Four interviewees (B, C, D, L) mentioned that EC was a factor in attracting and retaining skilled employees (code ReAtt). Amongst this group are tenants in the energy/infrastructure and related consulting sectors (B, D), summed up by interviewee B, thus:

Young engineers expect a building with high environmental performance. The staff talk about it.

(quotations)
Interestingly, interviewees C and L reasoned similarly, though not in sectors so clearly related to large direct negative environmental impacts. According to interviewee C:

Staff recruiting is tight. A clear environmental profile is an important factor in attracting younger employees. (quotation 6)

This corroborates findings from a recent survey of Swedes between 15 and 24 years old in which 25% of respondents identified environmental and sustainability related considerations as being decisive in choice of workplace (Ungdomsbarometern, 2015). In the same survey, nearly one in three respondents identified insufficient consideration of sustainability issues as a valid reason for ignoring potential employers. Meanwhile, other interviewees (F, G, I) pointed to the high standard (and newness) of fixtures, fittings, furnishings and design (i.e., MSKlocke) as being a significant factor. The same interviewees noted proximity to public transport and services as significant here too (as considered in LEED and BREEM), though location is and has always been such a dominant feature of a premises’ value that this feature cannot necessarily be ascribed to EC.

**EC’s effect on tenants’ external relations**

Figure 3 shows that the number of questionnaire respondents who had performed either ‘some intentional communication’ or ‘active strategic communication’ externally varied between 32% (other financial actors) and 50% (media). The proportion that did not carry out any intentional communication externally varied between 43% and 57%. Meanwhile, Figure 2(a) shows that about 60% of questionnaire respondents perceive EC as advantageous in relation to the external actors mentioned. Interviewees also mention the value of the certification itself (code MSCert), e.g., the third-party verification necessary (B, G, H) and the symbolic value of the certificate (N), or displaying a physical certificate on the building (L).

Value creation in relation to tenants’ clients (code ReKund) varied for tenants in different sectors. Interviewees B and D in the energy/infrastructure and related consulting sectors noted ad hoc benefits in certain sales situations, though not more generally. Interviewees I (information technology sector) and L (financial services) had perceived advantages in tenders to public authorities. Interviewee F noted low interest in general from their clients, though they did mention it to visitors to the premises.

On the wider question of branding and general marketing (code ReVaru) interviewees responses were also divergent. Interviewee G noted that EC was used in marketing, others giving examples such as press releases (H, L). Interviewees D and H noted that the direct environmental impacts of their wider business activities overshadowed their premises’ EC with respect to their marketing and branding strategy. In the words of interviewee H:

It would be ridiculous to make hay out of the fact that we are in an environmentally certified building. The premises’ environmental impacts are negligible compared to the company’s environmental impacts as a whole. (quotation 7)

Some interviewees referred to the EC being subordinate to their organizations’ wider environmental management work (H, B, C). Non-profit interviewee E and the higher education institution N noted that they had not pursued any marketing initiatives related to their premises’ EC. Many interviewees and 24 questionnaire respondents said their companies used overall environmental management systems, often ISO 14001 certified. All the interviewees in the public sector (N, M, K, J) noted the benefit of the low energy demand in their EC premises for official reporting for public authorities according to government environmental management regulations (SEA, 2015; SEPA, 2015, code ReRap). Non-public organizations noted that their EC was useful for reporting in other ways, for example according to ISO 14000 requirements (C and I) for yearly reporting (A) or for reporting greenhouse gas emissions (G) in accordance with the Global Reporting Initiative. Interviewees B and H in energy, infrastructure and related consulting sectors and in manufacturing noted that their wider business activities were the main focus for their ISO-certified environmental management strategies overshadowing their premises EC. Interviewee L noted that though they had ISO-certified environmental management, their energy use had not actually been reduced because systems in their building were being commissioned. Clearly here, the performance gap issue noted elsewhere (Nelson & Frankel, 2012; Tuohy & Murphy, 2015) associated particularly with the international tools LEED and BREEM is also being perceived by tenants. In contrast, the Swedish domestic tool Miljöbyggnad requires performance measurement after two years of operation for certification.

The in-depth study of the environmental impacts of interviewee A’s organization in old premises compared with those from a new EC premises showed that the move did significantly contribute to reducing environmental impacts from their premises, primarily in terms of reduced greenhouse gas emissions from occupier’s energy use in the building (which is clearly directly attributable to the premises’ EC) and energy use for commuting.
Finally, Figure 2(b) shows that most questionnaire respondents do not perceive a noticeable difference in their relations with their landlord due to EC premises. In interviews, public authorities (K, M) renting premises in the same building note separately that they appreciate their scheduled meetings with the property owner, who was noted as sharing their goal of low energy demand (code ReFä). Meanwhile, interviewees B and D noted rental contracts incentivizing low energy demand for property owners as advantageous.

**Driving forces for EC amongst tenants**

Figure 5(a) shows that there is a narrow majority of respondents for whom EC affected the leasing decision ‘minimally’. Meanwhile, for 38% it affected it ‘greatly’. In addition, Figure 5(b) shows a proportionally large number of tenants who did influence the property owner’s decision to apply EC and related enhancements. Few interviewees mention an active choice of EC tool for their premises. Where they do, they have indicated that it was done based on the recommendation of the property owner (code DrVal; interviewees C, D, G).

Interview responses were analysed according to driving forces for EC amongst the various tenants (codes DrVal, DrA and DrVem). The strongest driving force is designated here ‘mandatory specification’, where the tenant has stipulated EC as a necessity for their premises. Interviewees who, based on our analysis of their statements, belong to this category are shown in Table 3, along with their distinguishing characteristics. Table 3 also shows that four out of the five in this category were de facto initiators of the construction project for the EC building and are the dominant tenants in their building. Table 3 shows that many tenants are in sectors commonly noted for performing activities with high direct environmental impacts (as noted by Eichholtz, Kok, & Quigley, 2009b), though tenants in other sectors are here as well. Interview testimony confirmed that the key common driving force amongst ‘mandatory specification’ organizations was an active and engaged internal environmental management operation. As shown in Table 1, interviewees B and N are notably amongst the earliest to have pursued EC in the whole country.

Tenants who have been assigned to the driving force category ‘desirable specification’ are shown in Table 1. Here, EC is an important factor in decision-making, but only after other, necessary criteria have been fulfilled. As shown in Table 1, all were private companies, though none were in sectors viewed as having high direct environmental impacts. They were also generally not the dominant tenant in their building. Finally, Tables 1 and 4 show five organizations that were ‘unaware’ of their premises’ EC. Table 4 also shows organizations that made procurement specifications related to EC – energy (D), cost (G) and non-specified environmental specifications (E). Two public agencies (K, M) did not identify any related requirements.

**Discussion and comparison with property owners’ perceptions**

Table 5 categorizes potential areas for value creation for tenants investigated in this study in three ways. The leftmost column shows areas where value creation has been confirmed for tenants that are plausibly directly connected to EC. The middle column shows areas where value creation has been confirmed for tenants in the study, but where this is likely caused by features other than EC and related enhancements. Of particular note...
here is the role that the perception of a new, modern, open, light office space with higher-standard finishes, fixtures and furnishings, co-location of previously separate groups of employees or building location can have besides factors directly related to EC. Finally, the rightmost column shows areas where this study shows that tenants do not actually perceive value creation, even though previous work suggests that value creation occurs.

In future research it can be investigated whether tenants do (or do not) perceive value creation from EC specifically for areas shown in the middle column. To test this, a twin study could be designed following up tenants in EC buildings and otherwise as-near-as-comparable non-EC buildings. Another potential area for future research is to investigate how significant the investigated areas are for value creation for tenants from the perspective of their overall strategic management. One way to address this is to map the areas shown in Table 5 into comprehensive performance measurement systems for typical tenant organizations. This could firstly be a theoretical undertaking for representative typical tenants and also empirically study cases of real organizations.

Meanwhile, Table 6 compares findings from this study with those about property owners’ perceptions of value creation from EC from a different study performed as part of the same project as this one. Table 6 shows that reduced energy costs are a priority for property owners. The property owners did not communicate that they understood that many tenants pay little attention to their premises-related energy costs, even with clear contractual incentives to do so. Nor did they communicate that they understood that low energy demand was strategically valuable to certain tenants for sustainability reporting purposes.

Table 6 also shows that tenants did not perceive employee health or productivity benefits from their EC premises, which corresponds with property owner’s perceptions. This breaks from previous research findings noted above. Many hypotheses can be formulated to explain this. Firstly, the code-compliant level of IEQ in Sweden is higher than in the US (where many studies

### Table 4. Interviewees assigned the driving force ‘unaware’ including distinguishing characteristics.

|                      | Public agency | Private | Non-profit |
|----------------------|---------------|---------|------------|
| EC-related specifications | D (energy demand) | G (low total rental cost) | E (unspecified environmental spec.) |
| No EC-related specification identified | K, M          |         |            |

Note: For further characteristics, see also Table 1.

### Table 5. Summary of value creation in EC premises for tenants found in this study, categorized according to whether data suggest a potential for value creation and the degree to which it can be related to EC and environmental enhancements.

| Potential for value creation from premises, though potentially related to premises features not affected by EC and environmental enhancements | No value creation identified from EC and environmental enhancements |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Employee environmental awareness | Indoor environmental quality (IEQ) |
| Attractive to potential employees | Total premises costs |
| Sustainability reporting | Creativity |
| Reduced energy costs | Workplace morale |
| Cooperation with landlord on energy issues | Health of building users |
| Various benefits in relation to external partners | Investor relations |
|                                                                                                                                  | Employee productivity |

### Table 6. Comparison between tenant and owner perceptions of value creation.

| Tenants (this study) | Property owners (from the same project as this study) |
|----------------------|-------------------------------------------------------|
| Energy               | Energy cost not prioritized by many tenants. However, low energy demand valued for sustainability reporting purposes |
| Material choice      | Reduced energy costs are interesting for the improvement of net operating income |
| Tenant health productivity | Clear examples from transactions and in establishing credibility with tenants of the value of a documented conscious choice of materials. Also examples of tenant specifications of materials |
| Tenant specification for EC | Owners did not perceive a productivity increase for tenants in EC buildings. Some evidence of an awareness of previous research results on the matter, though |
| Rent                 | Evidence of large organizations specifying EC for large premises |
|                      | Evidence of large financially stable tenants specifying EC in contracts |
|                      | Many believe that rental rates may be higher and vacancies lower particularly in the long-term, or that there is no difference |
relating IEQ and productivity are performed). This hypothesis could be investigated by comparing physical IEQ parameters in EC and non-EC buildings in Sweden and potentially the US also alongside parallel IEQ questionnaires to users. A different hypothesis is that tenants are not aware of the research results connecting IEQ with health and productivity benefits, or that they are potentially connected. If they are actually aware, further hypotheses may be formulated. Tenants’ disregard of the potential connection may arise because it is not strategically efficient or prioritized for them to follow it up. This may be because IEQ is but one of many potential drivers of productivity and health, making it problematic to follow up specifically in strategic performance assessment. At the same time, the earlier research arguing for a connection between IEQ and improved health may contribute to a discourse that causes tenants’ decision-makers to view EC buildings positively, even if it is not strategically prioritized to follow up the connection in their own organization. There is clearly a web of hypotheses that could be effectively investigated with a focused qualitative interview study similar to this one.

This finding should be contrasted with the finding that EC was judged to be important internally, potentially contributing to attracting and retaining staff, and improved environmental awareness. Employee morale was shown to increase, but could be dependent on features not connected to the premises’ EC and related enhancements. Property owners investigated in this project were largely silent on this subject. The literature review in this paper showed that earlier research is quite inconclusive on these connections. Future research could be centred around particular environmental enhancements noted as significant in this project, e.g., enhancements to encourage cycling, source separation of waste and development of a roof garden (according to the previous property owner investigation). Investigation of each enhancement mentioned could take the form of case studies of buildings’ featuring particular enhancements, potentially comparing them with those without enhancements. The cases could be investigated through interviews and questionnaires of building users. Results could inform tool design, as well as tenant and owner strategies. A feature of such a study could be to investigate if employees are affected to the extent that not only their environmental awareness increases but also their employee morale, engagement or purposefulness at work (e.g., McKnight & Kashdan, 2009). Given the significant socially mediated component of such effects, a comparative study in a different country could also be interesting.

Table 6 also shows that the connected issues of material choice, documentation and low-emitting materials are not ones that are widely appreciated amongst tenants or owners. Given that some owners have perceived that it is an important part of their service to tenants in offering EC buildings, the findings suggest that owners should develop their communication with tenants on this issue to differentiate EC buildings further.

On the point of rental costs, the key outcome shown in Table 6 is that neither owners nor tenants ascribe to the simple rental premium story suggested by previous research. Nor does this project strictly refute the idea that rental premiums actually exist. Owners note that rent differentiation may arise in the future as a discount for non-EC buildings. Owners and tenants in this project note countless areas where EC buildings are differentiated (e.g., in tenant specifications for EC premises; see also Table 6), supporting the idea that their rental rates are determined in a different market to non-EC. One hypothesis that could explain such findings is that the setting of rental rates is the result of a negotiation between owners and potential tenants where EC affects the result positively in the landlord’s favour. Owners and tenants in this conception are both satisficers (e.g., Hansson, 2005, p. 22) happy to accept a certain range of rental rates down to or up to a certain level of satisfactoriness. A satisficing tenant can then claim not to have paid more for an EC premises if she has not altered the limit for satisfactoriness. This hypothesis could be investigated through detailed case studies of relevant negotiation processes, obtaining data through interviews with negotiants, and the study of related documents.

**Limitations**

A specific limitation for this paper is that respondents were identified by tenant organizations with a large degree of self-selection. This self-selection may reflect the relative significance given to environmental issues in general in different organizations. On the other hand, it may also have given rise to the highly varying level of detail to which interviewees could respond to questions (Table 2). Other issues affecting the perceptions of different respondents are the time of move in (shown for interviewees in Table 1) which may affect respondent recall and even the motives for choosing EC.

As with all empirical investigations, this study makes basic assumptions about the trustworthiness and credibility of data sources. All data were gathered on condition of anonymity for respondents, though conscious or unconscious self-justificatory or overly optimistic responses are still possible. On the other hand, no particular response was in and of itself one-sidedly optimistic or pessimistic. As the study’s outcomes demonstrate, the data do describe notable variation amongst the target
group. Nevertheless, no single response was so different from others obtained in this study or to expectations based on previous research so as to suggest a non-credible testimony.

Conclusions

A research outcome significant for many of the involved actors is that tenants perceive value creation from their EC premises mostly through the support they derive from it for external environmental reporting, amongst internal benefits in general. Understanding and supporting the environmental reporting needs of their tenants with EC is therefore an important service for landlords to offer. Further along the chain of influence, tool developers may consider how documentation requirements for EC can be coordinated with the environmental reporting needs of tenants, for example through the Global Reporting Initiative framework that has been shown to be popular. Closer integration with tenants’ environmental reporting is a further factor that supports the expansion of the use of ongoing performance evaluation for certification purposes in EC tools rather than design documentation as used in LEED and BREEAM. Ongoing performance evaluation could also better meet the needs of property valuers. Though some tenants recognize the benefit of lower energy costs in their EC premises, it seems that many do not. The benefit of low energy demand in EC buildings is thus more generally important for tenants for environmental reporting purposes.

Landlords should also consider how their EC strategy facilitates tenants’ strategic management objectives in environmental awareness, since this was another area identified in the study for value creation. Further research could reveal the significance of specific enhancements in this area that could also be used to support the further development of tool criteria to support tenants’ employees’ environmental awareness.

IEQ was shown to be important for tenants, though few considered the conscious selection of non-toxic building materials and the low-emitting substances. Based on this finding it could be strategically significant for landlords to raise this issue more to differentiate EC premises.

The study has also shown that many things that tenants seem to appreciate in their EC premises’ seem to depend on features that cannot be simply attributable to EC. Rather they may be attributable the overall high standard and newness of the overall interior design, fixtures, fittings furniture and finishes and high IEQ. New research directly comparing EC with non-EC buildings could shed more light on whether EC actually affects these parameters, for example rental rates.

Note

1. To ‘make hay’ out of something is an idiomatic phrase meaning to attempt to exploit that something for great benefit. The English idiomatic phrase is used here to reflect most faithfully the interviewee’s exact quote in Swedish – ‘att slå mynt av’ – literally translated as ‘to make coin of’.

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References

Albertini, E. (2013). Does environmental management improve financial performance? A meta-analytical review. Organization and Environment, 26(4), 431–457. doi:10.1177/1086026613510301

Ammenberg, J. (2004). Miljömanagement: Studentlitteratur. Atis Real. (2008). ‘True’ sustainability and the UK property market. London: Atis Real.

Baird, G., Leaman, A., & Thompson, J. (2012). A comparison of the performance of sustainable buildings with conventional buildings from the point of view of the users. Architectural Science Review, 55(2), 135–144. doi:10.1080/00038628.2012.670699

Boyd, T. (2006). Can we assess the worth of environmental and social characteristics in investment property? Pacific Rim Real Estate Conference, Auckland, New Zealand.

Boyd, T., & Kimmet, P. (2005). The Triple Bottom Line Approach to Property Performance Evaluation. Pacific Rim Real Estate Conference, Melbourne, Australia.

Brown, N., Malmqvist, T., & Wintzell, H. (2015). Owner organizations’ value-creation strategies through environmental certification of buildings. Building Research & Information, 1–12. doi:10.1080/09613218.2016.1099031

Choi, Y., & Yu, Y. N. (2014). The influence of perceived corporate sustainability practices on employees and organizational performance. Sustainability, 6(1), 348–364. doi:10.3390/su6010348

Cushman and Wakefield. (2009). European landlord and tenant survey 2009. London: Cushman and Wakefield LLP.
Delmas, M. A., & Pekovic, S. (2013). Environmental standards and labor productivity: understanding the mechanisms that sustain sustainability. *Journal of Organizational Behavior, 34*(2), 230–252. doi:10.1102/job.1827

Dixon, T., Ennis-Reynolds, G., Roberts, C., & Sims, S. (2009). *Demand for sustainable offices in the UK*. London: Investment Property Forum.

Eichholtz, P., Kok, N., & Quigley, J. M. (2009a). *Why Do Companies Rent Green? real property and corporate social responsibility*. Berkeley, CA, USA. Retrieved from Working Papers.

Eichholtz, P., Kok, N., & Quigley, J. M. (2009b). *Why Do Companies Rent Green? Real Property and Corporate Social Responsibility*. London: K. University.

Epstein, M. J., & Rejc, A. (2014). *Making sustainability work: best practices in managing and measuring corporate social, environmental, and economic impacts* (2nd ed, revised and updated. ed.). Sheffield, UK: Greenleaf.

Fastighetsägarna. (2012). *Grönt hyresavtal – en handledning*. Retrieved from http://www.fastighetsagarna.se/gronthyreavtal

Fuerst, F., & McAllister, P. (2011). *Green noise or Green value? measuring the effects of environmental certification on office values*. *Real Estate Economics, 39*(1), 45–69. doi:10.1111/j.1540-6229.2010.00286.x

Hansson, S. O. (2005). *Decision theory: A brief introduction*. Hart, S. L. (1995). A natural-resource-based view of the firm. *Academy of Management Review, 20*(4), 986–1014.

Haynes, B. P. (2011). The impact of generational differences on the workplace. *Journal of Corporate Real Estate, 13*(2), 98–108. doi:10.1108/14630011111156812

International Energy Agency (IEA). (2013). *Transition to sustainable buildings: strategies and opportunities to 2050*. Paris: IEA.

IVSC. (2013). *International valuation standards 2013. framework and requirements*. London: International Valuation Standards Council.

Jones Lang LaSalle. (2008). *Global trends in sustainable real estate: An occupiers perspective*. London: Jones Lang LaSalle.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—measures that drive performance. *Harvard Business Review, 70*(1), 71–79.

Kats, G., Braman, J., & James, M. (2010). *Greening our built world: costs, benefits, and strategies*. Washington, DC: Island Press.

Leder, S., Newsham, G. R., Veitch, J. A., Mancini, S., & Charles, K. E. (2016). Effects of office environment on employee satisfaction: a new analysis. *Building Research and Information, 44*(1), 34–50. doi:10.1080/09613218.2014.1003176

López-Gamero, M. D., Molina-Azorin, J. F., & Claver-Cortés, E. (2009). The whole relationship between environmental variables and firm performance: competitive advantage and firm resources as mediator variables. *Journal of Environmental Management, 90*(10), 3110–3121. doi:10.1016/j.jenvman.2009.05.007

Lützkendorf, T., & Lorenz, D. (2007). Integrating sustainability into property risk assessments for market transformation. *Building Research and Information, 35*(6), 644–661. doi:10.1080/09613210701446374

Malmqvist, T., Glaumann, M., Svenfelt, A., Carlson, P. O., Erlandsson, M., Andersson, J.,… Malmström, T. G. (2011). A Swedish environmental rating tool for buildings. *Energy, 36*(4), 1893–1899. doi:10.1016/j.energy.2010.08.040

Marshall, C., & Rossman, G. B. (1995). *Designing qualitative research* (2nd ed). Thousand Oaks, CA: Sage.

McCunn, L. J., & Gifford, R. (2012). Do Green offices affect employee engagement and environmental attitudes? *Architectural Science Review, 55*(2), 128–134. doi:10.1080/00038628.2012.667939

McKnight, P. E., & Kashdan, T. B. (2009). Purpose in life as a system that creates and sustains health and well-being: An integrative, testable theory. *Review of General Psychology, 13*(3), 242–251. doi:10.1037/a0017152

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: an expanded sourcebook* (2nd ed). Thousand Oaks, CA: Sage.

Miller, D. C., & Salkind, N. J. (2002). *Handbook of research design & social measurement* (6th ed). Thousand Oaks, CA: Sage

Nelson, A., & Frankel, A. (2012). *Building Labels vs. Environmental Performance Metrics: Measuring What’s Important about Building Sustainability*. Newsham, G. R., Birt, B. J., Arsenault, C., Thompson, A. J. L., Veitch, J. A., Mancini, S.,… Burns, G. J. (2013). Do ‘Green’ buildings have better indoor environments? New evidence. *Building Research and Information, 41*(4), 415–434. doi:10.1080/09613213.2013.789951

Pearce, D. (2003). *The social and economic value of construction: The construction industry’s contribution to sustainable development*. London, UK: nCRISP the Construction Industry Research and Innovation Strategy Panel.

Puybaraud, M., Russell, S., McEwan, A. M., Leussink, E., Beck, L., Brand, J.,… Kamath, M. (2010). *Generation Y and the workplace*. http://tinyurl.com/zma3n36

Robinson, J. (2005). *Property valuation and analysis applied to environmentally sustainable development* 11th Pacific Rim Estate Society Conference Melbourne, Australia.

Royal Institution of Chartered Surveyors (RICS). (2005). *Green value. Green buildings, growing assets*. London: Royal Institution of Chartered Surveyors.

Sambasivan, M., Bah, S. M., & Ho, J. A. (2013). *Making the case for operating a green office*. London: Royal Institution of Chartered Surveyors.

SE. (2015). *Energieffektiva myndigheter*. Eskilstuna, Sweden: Swedish Energy Agency. Retrieved from http://tinyurl.com/nbje752

SEPA. (2015). *Miljööverväganden i staden 2014. En redovisning* (Report No. 6669). Stockholm: SEPA. http://www.du.se/PageFiles/118151/Milj%C3%B6%20redovisning%202014.pdf

Sweden Green Building Council (SGBC). (2013). *BREEAM* SE. *English manual for new construction and refurbishment*. Version 1.0. Stockholm: Sweden Green Building Council.
Sweden Green Building Council (SGBC). (2014). Miljöbyggnad. Rating Assessment Criteria for New Buildings. Stockholm: Sweden Green Building Council.
Tuohy, P. G., & Murphy, G. B. (2015). Are current design processes and policies delivering comfortable low carbon buildings? Architectural Science Review, 58(1), 39–46. doi:10.1080/00038628.2014.975779
Turban, D. B., & Greening, D. W. (1997). Corporate social performance and organizational attractiveness to prospective employees. Academy of Management Journal, 40(3), 658–672. doi:10.2307/257057
Ungdomsbarometern (Cartographer). (2015). Studier, karriär, framtid.
US Green Building Council (USGBC). (2013). LEED reference guide for building design and construction (2013 edition. v 4. ed.). Washington, DC: USGBC.
Varoufakis, Y., Halevi, J., & Theocarakis, N. (2010). Modern political economics: Making senses of the post-2008 world. London: Routledge.
Warren-Myers, G. (2012). The value of sustainability in real estate: a review from a valuation perspective. Journal of Property Investment and Finance, 30(2), 115–144. doi:10.1108/14635781211206887
World Green Building Council (WGBC). (2013). The business case for green building. A Review of the Costs and Benefits for Developers, Investors and Occupants. http://tinyurl.com/kc72y2b.