On the potential of voluntary environmental programmes for the built environment: A critical analysis of LEED

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Abstract

Voluntary environmental programmes (VEPs) are increasingly gaining traction as a means of improving the environmental performance of buildings and their occupants. These programmes are of interest because they incentivise developers, property owners and occupants to improve such performance voluntarily beyond what is required by governmental construction regulation. This article questions whether such programmes have the potential to affect the environmental and resource sustainability of the built environment to a significant extent. It first briefly reviews the extant literature on voluntary programmes as developed in policy sciences and governance studies. It then studies the performance of a leading, often lauded, VEP in the built environment: LEED. In spite of LEED's impressive performance in absolute terms, this article concludes that LEED is a relatively poor performing VEP. This raises considerable questions about the potential of VEPs to improve sustainability in the built environment more generally.

Keywords: building environmental assessment, environmental governance, LEED, sustainable construction, voluntary environmental programme

1 Introduction

Voluntary environmental programmes (VEPs) have become enormously popular in addressing environmental risks (Borck & Coglianese, 2009; Potoski & Prakash, 2009). Normally, VEPs seek to stimulate organisations and individuals to improve their environmental performance voluntarily beyond what is required by governmental regulation. VEPs are of interest to governments, businesses and civil society groups alike. For governments, they offer a way out of the time-intensive and costly development, implementation and enforcement of statutory regulation and other direct regulatory interventions such as subsidies and taxes (cf. May & Koski, 2007). For businesses, they are a way of seeing environmental leadership rewarded and their interests served, as well as tapping into new markets (Borck & Coglianese, 2009). Finally, for civil society groups, they

provide a means of putting flesh on the bones of their activist campaigns. For example, in 1999, Greenpeace successfully campaigned against Home Depot (then the largest supplier of do-it-yourself products in the United States), which resulted in Home Depot seeking certification from the Forest Stewardship Council for all its timber products (Domask, 2003).

VEPs are actively applied to improve the environmental and resource sustainability of the built environment (Cole & Valdebenito, 2013; Fowler & Rauch, 2006; Yudelson & Meyer, 2013). Perhaps the best known VEPs for the built environment are LEED (Leadership in Energy and Environmental Design) and BREEAM (BRE Environmental Assessment Method). These two VEPs allow the assessment of the environmental performance of buildings and enable them to be ranked against others in their class (the words 'benchmarking', 'rating' and 'labelling' are often used interchangeably in this context, although they refer to slightly different approaches to classification; see Pérez-Lombard, Ortiz, González, & Maestre, 2009). Table 1 provides a random sample of ten typical VEPs for the built environment from around the world (examples from van der Heijden, 2014).

*****TABLE 1 ABOUT HERE*****

The active application of VEPs for the built environment is not surprising if the difficulties governments face in the development and implementation of statutory construction regulation, particularly in the area of the environmental performance of buildings and their occupants, are kept in mind (Bulkeley & Betsil, 2005; McManus, 2005). But what is the potential of VEPs to achieve large numbers of buildings with increased resource and environmental sustainability? This question drives the current article. Building on the literature on VEPs from policy sciences and governance studies, this article first seeks to gain a better understanding of the opportunities and challenges of VEPs. It then turns to LEED in order to examine how VEPs perform in improving environmental and resource sustainability for the built environment.

LEED is a critical case to study (Yin, 2003). It is widely considered to be one of the most – if not the most – successful VEPs in terms of the number of buildings it affects (e.g. Jones, 2008; Metzger, 2011; USGBC, 2013a). Some even claim that the application of LEED and its related assessment tools have become the ‘new normal’ in the built environment (Yudelson & Meyer, 2013, 17). Furthermore, LEED is widely relied upon and assimilated into governmental regulation and it has become a benchmark for other VEPs that seek to improve the environmental and resource sustainability of the built environment. LEED is also

one of the best documented and most mature VEPs in this area. This all means that existing documentation on LEED gives a rather unique and complete image of the opportunities and constraints of VEPs for the built environment. The question then is whether LEED has lived up to its promises as a VEP and if so, or if not, what we can learn from this example for the wider trend of VEPs for the built environment.

2 VEPs: a governance perspective

In 'building and built environment' scholarship, there is a growing body of literature that describes, compares and evaluates VEPs for the built environment (Cole & Valdebenito, 2013; Cooper & Symes, 2009; Dixon, Keeping, & Roberts, 2008; Horvat & Fazio, 2005; Lee & Burnett, 2008; Newsham, Mancini, & Birt, 2009; Todd, Pyke, & Tufts, 2013). This literature is particularly interested in the rules of these VEPs and how they relate to those of other VEPs, their performance in terms of buildings constructed or retrofitted, and the actual performance of buildings constructed or retrofitted under these VEPs. A related body of literature has emerged in policy sciences and governance studies. This literature has, however, a slightly different focus and is particularly interested in: (i) the structural characteristics of VEPs and how they may explain the performance of VEPs; (ii) the contextual characteristics of VEPs and how they may explain the performance of VEPs; (iii) the overall performance of VEPs as one of the many ways to address environmental risks. It may be worthwhile to review this literature briefly to increase our understanding of VEPs for the built environment.

2.1 Structural characteristics

What enables VEPs to reach their goals? Scholars of policy sciences and governance have long looked at the structure of VEPs. They have found that VEPs come in various forms and they question whether different forms of VEPs achieve different outcomes (Holley, Gunningham, & Shearing, 2012; Wurzel, Zito, & Jordan, 2013). For instance, do building assessment tools such as LEED and BREEAM achieve better or worse results than other VEPs for the built environment, such as green leases (Brooks, 2008) or sustainable procurement policies (Walker & Phillips, 2009)? Unpacking the structural characteristics of VEPs may be helpful in making such comparisons.

At the base of VEPs, a set of rules can normally be found. Such rules prescribe the goals of the VEPs, their expected outcomes and the expected behaviour of participants. Interestingly, the rules of VEPs often show considerable overlap with statutory regulation

implemented by governments (cf. May & Koski, 2007). Through comparisons of VEPs of different kinds and in different sectors, it has become clear that there is an association between the rules of a VEP, the number of participants it attracts and the overall performance of the VEP. Rules that are too stringent discourage (prospective) participants, but rules that are too lenient are unlikely to challenge participants truly to improve their environmental performance (Potoski & Prakash, 2009).

Another critical aspect of VEPs is their enforcement. Time and again scholars have found that without adequate enforcement, it is unlikely that a VEP will achieve its goals (Bailey, 2008; Lyon & Maxwell, 2007). Scholars are particularly critical of VEPs that rely on the self-enforcement of their rules by the participants. They expect more from VEPs that build on third-party monitoring, such as certification or auditing (Lyon & Maxwell, 2007; Potoski & Prakash, 2009) – as is, for instance, the case with LEED.

Finally, it has become clear that the rewards or penalties for compliance with a VEP's rules matter in reaching its goals. It goes without saying that enforcement is meaningless if there are no consequences for violation of a VEP's rules. Different forms of penalties have been discussed as having the potential to ensure the compliance of a VEP's participants: financial penalties, withdrawal of participants' membership or publication of the names of those in violation (King & Lenox, 2000; Short & Toffel, 2010). In a similar vein, different types of rewards may incentivise participants to join a VEP and to comply with its rules. Participants may obtain relevant and otherwise costly information from joining a VEP that helps them to improve their environmental performance (Lyon & Maxwell, 2007). By joining a VEP developed by a government, participants may gain access to public officials. Building relationships with public officials may be considered important as this could result in future projects and potentially provide public recognition, but also participants may hope to see their personal interests taken up in the policy agenda (Bischop & Davis, 2002). Participants may further join a VEP to showcase their environmental leadership or simply because they assume that they can tap into a profitable market through the VEP (Borck & Coglianese, 2009).

2.2 Contextual conditions

Whilst there may indeed be a relationship between the structure of VEPs (i.e. building assessment, green leasing, or sustainable procurement) and their outcomes (Holley et al., 2012; Wurzel et al., 2013), the context of VEPs also appears to matter. What contextual conditions may affect the performance of VEPs?

Existing governmental regulation is one of the conditions assumed to affect the outcomes of VEPs. It goes without saying that the existing regulatory and legal framework needs to allow (prospective) participants to join a VEP (Kollmuss & Agyman, 2002). But more is at stake. The threat of future governmental regulation, for example, may incentivise the development of and participation in VEPs (Jordan, Wurzel, & Zito, 2005). Participants may then seek to develop and join a VEP, hoping that this will forestall the implementation of governmental regulation that is stricter than that of the VEP. Participants may also seek to develop and join a VEP if this eases their compliance with governmental regulation (Short & Toffel, 2010). Finally, the regulatory culture, in particular the enforcement culture, of a context appears to have an impact on the performance of a VEP (Nwabuzor, 2005). Particularly in countries or regions with a history of poor performance in relation to governmental regulation, enforcement of the rules of VEPs may also be lenient (cf. Blackman, Uribe, van Hoof, & Lyon, 2013).

In a related vein, local market circumstances appear to be related to the performance of VEPs. Higher levels of GDP may provide individuals or organisations with the resources to participate in VEPs (Baughn, Bodie, & McIntosh, 2007). Higher levels of GDP are normally expected (and have been evidenced) to coincide with increased environmental concern (Givens & Jorgenson, 2013), which may mean that consumers ask for products and services exhibiting higher levels of environmental performance. Producers may wish to tap into this market and as discussed above, VEPs provide an ideal vehicle to market and showcase the environmental performance of their products and services.

Finally, societal pressure is considered another important contextual condition that may affect the performance of VEPs. As a result of pressure from non-governmental organisations (NGOs) or citizen groups, individuals or organisations may consider participation in a VEP as a way of showing that they are actively involved in addressing public concerns (Baron & Diermeier, 2007). The example of Home Depot and Greenpeace in the introduction to this article is a relevant illustration.

2.3 How do VEPs perform in general?

Overall, scholars from the fields of policy sciences and governance are not entirely positive about the performance of VEPs. It is often found that VEPs do not meet their goals because of inadequate enforcement practices (also see above). VEPs are then likely to become a means of ‘greenwashing’ participants’ behaviour, i.e. creating the illusion of improved environmental performance (Lyon & Maxwell, 2006). Furthermore, such VEPs may be

harmful because they could circumvent and undermine governmental regulation (Lenox & Nash, 2003). If there is a great deal of VEP activity, governments may, possibly wrongly, consider that a particular environmental harm is being addressed sufficiently by organisations and individuals in a particular sector. Strikingly, this literature repeatedly finds that participants in VEPs, in general, do not show better environmental performance than non-participants (for reviews of the literature, see Darnall & Sides, 2008; Lyon & Maxwell, 2007; Morgenstern & Pizer, 2007).

That said, this literature is also aware that VEPs should not be evaluated based only on their direct outcomes, such as the number of buildings constructed or retrofitted under a VEP, or the number of participants that join a VEP. It considers that VEPs may have indirect outcomes that are important but more difficult to assess. Information from a VEP may be diffused among participants and non-participants alike (Lyon & Maxwell, 2007). For instance, a highly environmentally concerned developer that seeks to have its buildings constructed to meet LEED certification may change the mindset of its contractors. Also, VEPs may result in sector-wide changes when they bring down the costs of particular products or test new methods of production (Darnall & Sides, 2008).

This brief review of the literature on VEPs from policy sciences and governance studies indicates that to understand the performance of VEPs in greater depth, conditions other than their black letter rules appear to matter. In other words, a comparison of the rules underlying VEPs for the built environment such as BREEAM and LEED may provide some insights as to why they perform differently (e.g. Cole & Valdebenito, 2013; Horvat & Fazio, 2005; Lee & Burnett, 2008), but will not provide a full picture. The literature discussed may add a fresh perspective to existing and future assessments of VEPs for the built environment. In what follows, this literature will be applied to give a 'fresh' analysis of an immensely popular VEP for the built environment: LEED.

3 LEED assessed through a 'governance' lens

In 1993, the United States Green Building Council (USGBC) made history by certifying the world's first LEED (Leadership in Energy and Environmental Design) building. This certification evidenced the building's leadership in environmental sustainability: it was assessed as the best in its class. LEED is part of a global trend in building environmental assessment tools (see Table 1 for examples). The idea underlying such tools is simple and elegant: by ranking a building in a certain class, its performance in terms of, for instance,

energy, water and material use can easily be compared to that of other buildings of the same class – at least in theory. It is this ease in making comparisons that makes these assessment programmes so attractive. For developers, investors, property owners and occupants alike, it is easy to understand that on a scale from poor performing to high performing, say one to five stars or bronze to gold, a five-star or gold-classed building is somehow better than a one-star or bronze-classed building. Building assessment performs an excellent marketing, branding and displaying function – locally, nationally and internationally.

LEED is a typical VEP in terms of its structure. Participation is voluntary (but see below on how LEED certification has become a mandatory requirement in governmental regulation and other VEPs). In order to have a building LEED certified, a developer or property owner must ensure that the building meets a number of LEED criteria. These criteria show striking similarities to those in traditional, statutory construction regulation (May & Koski, 2007). They are administrated by the USGBC, a non-profit tax-exempt organisation. The Council was established in 1993. Its constituency includes representatives from the construction industry, government, NGOs and citizen representatives, whilst its board of directors includes representatives from the construction industry and government (USGBC, 2013d). Formally, the USGBC has no ties with government. The LEED criteria are developed by working groups and committees, whose members also represent business, government and NGOs.

Under LEED, buildings can be classified as Certified, Silver, Gold or Platinum. The more LEED criteria a building meets, the more credits it receives and the higher its classification. Certifications are issued by a third-party certifier. Interestingly, LEED does not indicate what these terms actually mean. In contrast, the Australian counterpart of LEED, Green Star, classifies buildings on a six-point scale and indicates that four stars means ‘best practice’, five stars means ‘Australian excellence’ and six stars means ‘world leader’ (for a comparison of LEED with GreenStar, see Yudelson & Meyer, 2013; for a comparison of LEED with other benchmarking tools, see Cole & Valdebenito, 2013; Fowler & Rauch, 2006; Horvat & Fazio, 2005; Lee & Burnett, 2008).

LEED is also a typical VEP in terms of the contextual conditions under which it was developed. The USGBC website (http://usgbc.org) mentions the market opportunities for the VEP, how it fills a gap in statutory construction regulation and how participation in LEED may, indeed, be part of a participant’s response to a societal demand for more sustainable practices. Space prevents provision of a more extensive overview of the structural and contextual conditions of LEED, but there is no shortage of literature that discusses it (Cole &

Valdebenito, 2013; Cooper & Symes, 2009; Dixon et al., 2008; Horvat & Fazio, 2005; Lee & Burnett, 2008; Newsham et al., 2009; Todd et al., 2013; Yudelson & Meyer, 2013).

3.1 Direct outcomes of LEED: buildings built and performance

LEED comes with accolades and critiques alike. Some research points out that there is an emerging market for LEED-certified office space. The demand for sustainable office space appears to be related partly to the desire of organisations to showcase their 'sustainable' credentials (Dixon, Ennis-Reynolds, Roberts, & Sims, 2009). The certification of their buildings provides a clearly visible and internationally accepted approach to showcase these credentials. Also, empirical research shows that sustainable office space may yield higher rents and higher selling prices (Eichholtz, Kok, & Quigley, 2010; GBCA, 2013). This further confirms the findings on the contextual conditions of VEPs in the literature discussed. However, the same research indicates that other factors, such as location and building quality, remain the major drivers for occupants who seek to rent sustainable office space, whilst the assumed high upfront costs of developing sustainable buildings still seems to be a barrier to developers' participation in LEED (WGBC, 2013).

3.1.1 Absolute versus relative performance

In terms of absolute performance, the VEP's achievements are impressive. LEED has been exported around the world and has now been adopted in 135 countries and territories – interestingly, however, it has not yet been a topic addressed in the well-developed policy transfer and policy diffusion literature (Evans & Davies, 1999; Knill, 2005; Lyon & Maxwell, 2007). Around the globe, close to 20,000 projects have been LEED certified since 1993 (USGBC, 2013b). By the end of 2013, more than 10 billion square feet of built space was LEED-certified in the United States (USGBC, 2013d). In India, the number is also astonishing: 1.8 billion square feet of built space had already been LEED-India certified by the end of 2013 and the Indian Green Building Council expects that the country will soon surpass the United States in terms of having the highest volume of LEED-certified built space of any country in the world (IGBC, 2013). This performance by LEED and its global uptake dwarves that of the runner-up VEP in the construction industry, BREEAM (Cole & Valdebenito, 2013). But what do these numbers actually mean?

When LEED is viewed in relative terms, these astonishing numbers change considerably (see also Hoffman & Henn, 2009). The built space in the United States was, by

the end of 2013, assumed to be close to 350 billion square feet.[1] The building stock in an economy such as the United States grows by about two per cent per year (IEA, 2009). This implies that since LEED was introduced, the building stock in the United States has grown approximately 48 per cent or 115 billion square feet (this is a very modest estimate). It may be expected that LEED is predominantly applied in this 'new' building stock and not in the pre-1993 building stock of the United States (Cole & Valdebenito, 2013). This suggests that LEED has achieved market coverage of 8.7 per cent of all 'new' built space constructed since 1993. This puts claims that LEED has become the 'new norm' for the built environment (Yudelson & Meyer, 2013, 17) in a slightly different light. It further shows one of the shortfalls of VEPs such as LEED: they are highly popular for new buildings, but less so for existing ones. When considering the *total* built space in the United States, it has taken LEED 20 years to cover approximately 2.9 per cent of this space, i.e. an average of about 0.14 per cent per year. The numbers for India are somewhat better, but still modest. Its current built space is, conservatively, estimated at 25 billion square feet, giving LEED-India coverage of under six per cent over the course of seven years, i.e. an average of about 1.15 per cent per year.[2]

When these numbers are further unpacked, the picture becomes even more grim. The USGBC Council keeps stressing, rightly, that high-performing sustainable buildings do not have to cost more than conventional buildings (USGBC, 2010). One would therefore expect that it would strive for its members to achieve the highest environmental performance possible – that is, LEED Platinum certification. Yet only six per cent of LEED-certified buildings are rated Platinum (Yudelson & Meyer, 2013). If, as a thought experiment, the true positive impact of LEED on the built environment is considered the attainment of Platinum-rated buildings (after all, they are marketed as possible and cost-effective), then the true 'success' of LEED shrivels to a mere 0.4 per cent of all 'new' built space in the United States constructed since 1993, the year in which LEED was introduced. This reflects a mere 0.17 per cent of all of the built space in the United States over a period of 20 years, i.e. an average of about 0.0086 per cent per year.

Of course, many high-performing buildings in the United States may be inspired by LEED Platinum criteria but not certified as such and are thus 'under the radar' of this evaluation. But even if every LEED Platinum building has inspired (the unlikely number of) 10 other high performing but not LEED Platinum-certified buildings, the transformative

[1] Data from: http://www.citymayors.com/development/built_environment_usa.html
[2] Data from: http://www.urbannewsdigest.in/green-cities/

impact of LEED (Platinum), the world's leading VEP for the built environment, is still quite limited.

3.1.2 Do LEED buildings outperform conventional buildings?

LEED has also witnessed significant criticism in terms of its participants' performance. In its early days, the successes of LEED buildings in terms of energy reductions that were reported by the USGBC were questioned (Gifford, 2009). LEED was further criticised for having a focus on assumed energy performance and not evidence-based energy performance. The initial approach of VEPs such as LEED and BREEAM was to certify a building based on an assessment of its design (certified 'as designed') or based on a series of audits carried out during its construction (certified 'as constructed'). The true performance of buildings, however, only becomes clear when they are in use. Both LEED and BREEAM and other benchmarking tools have now introduced a category to assess buildings 'in operation' to enable them to certify these buildings on their actual performance (BRE, 2013; USGBC, 2013c; Yudelson & Meyer, 2013). This new category appears all the more important because the actual performance of these VEPs is still being questioned. For instance, there does not appear to be a correlation between the energy savings of an LEED-certified building and the number of credits the building was awarded (Newsham et al., 2009). Furthermore, studies have indicated that LEED-certified buildings do not outperform conventional buildings in terms of energy usage or greenhouse gas emissions (Scofield, 2009) and in certain examples they even seem to perform worse (Scofield, 2013). More strikingly, a building can be certified LEED Platinum, the highest tier of certification, even when it uses double the energy of a state-of-the-art sustainable building under some European building assessment programmes (Yudelson & Meyer, 2013).

Another often heard critique is that the tool allows for gaming (Hoffman & Henn, 2009). Some of the criteria that LEED sets are easier or cheaper to meet than others. The introduction to an article on a sustainable construction information website is telling:

> '*How to Cheat at LEED for Homes*: The road to green certification is paved with low-hanging fruit. This cheat sheet with 22 shortcuts will get you to LEED certification without a lot of trouble.' (Seville, 2011)

These '22 shortcuts' allow a gain of 70 LEED credits, which is sufficient for a building to be 'Gold' certified, the second highest tier of certification. LEED is also criticised

for not addressing the context of LEED-certified buildings or adopting a more holistic approach to urban sustainability. For instance, critics wonder how a parking garage (even if it is solar powered) that adds 1,700 parking spaces to Santa Monica's city centre or the highly energy-and water-intensive casinos in the desert in Las Vegas can be certified under LEED (Alter, 2008; USA Today, 2013). They ask why LEED does not take into account issues such as the transport of 'sustainable' building materials. After all, if these materials have to be transported over considerable distances, their environmental performance is de facto obsolete (de Leon, 2013).

This all further reduces the true transformative impact of LEED on the built environment.

3.2 Indirect outcomes of LEED: copycats and its uptake by governments and other VEPs

Not only has LEED (and BREEAM, for that matter) been exported to many countries and regions, it has also inspired others to develop their own building environmental assessment programmes, for instance Green Star in Australia, the DGNB system (Deutsche Gütesiegel Nachhaltiges Bauen) in Germany, GreenRE (Green Real Estate) in Malaysia and BEAM-plus in Hong Kong. Initiators of these VEPs often claim that they developed their own VEPs because they felt that LEED and BREEAM did not suit their local built environment, climate, regulations and standards. As a result, they felt tailored VEPs were needed; they further claim to have responded to some of the early critiques expressed regarding LEED (cf. DGNB, 2009; HKGBC, 2013). Yet, these claims are somewhat contradicted by the wide uptake of LEED around the world, which seems to imply that it is flexible enough for local adaptation. Furthermore, it is striking that VEPs such as Green Star and the DGNB system are actively exported around the world by their developers. Green Star is also applied in South Africa (GBCA, 2012), whilst the DGNB system has been exported to some 20 countries, such as Bulgaria, Thailand, China and Brazil (DGNB, 2013). Building environmental assessment tools appear themselves to have become a market and limited attention has been paid to competition between such VEPs to date. This is a striking omission and would make an interesting topic in the policy transfer and policy diffusion literature (Evans & Davies, 1999; Knill, 2005; Lyon & Maxwell, 2007). After all, with competition between LEED and other VEPS, a possible race to the bottom in standards is not fully fictional (cf. Potoski & Prakash, 2009).

3.2.1 LEED certification mandated by governments

The issue of the potential effect of competition aside, in the United States and elsewhere, governments are increasingly assimilating LEED criteria into their own construction regulations or consider particular levels of LEED certification sufficient to comply with construction regulations (Schindler, 2010). This is a very direct method of incorporating LEED into governmental regulation, but more indirect approaches are also used. The State of Maryland in the United States ran the *Green Building Tax Credit Program* from 2009 to 2012. The programme provided developers with tax credits for the construction and retrofitting of energy-efficient buildings. The programme was closely linked to LEED. Tax credits would only be issued if a building, upon completion, met LEED Gold requirements and an LEED-accredited professional assessed the construction work once finished. The State of North Carolina in the United States allows all its counties and cities to charge reduced building permit fees for buildings that meet the criteria established by LEED or another nationally recognised programme. A few jurisdictions in North Carolina are further allowed to provide density bonuses to builders who build or retrofit energy-efficient buildings. Again, a link with LEED is established as the standard for assessment (North Carolina General Assembly, 2008). To give a final example, since the passage of the Local Law 86 in 2005, the City of New York has required that building projects that receive more than a specified amount of city government funding achieve an LEED rating level of Certified or Silver (City of New York, 2005). In short, state and local governments throughout the United States offer developers and building owners financial incentives, such as tax breaks, to have their buildings LEED certified. Other governments in the United States have adopted similar LEED regulatory requirements in their policies and require that their buildings meet certain LEED ratings. With 27 per cent of all LEED projects being government owned or occupied in the US, such governmental requirements have a significant impact on the performance and reach of LEED (USGBC, 2013a).

This uptake and mandating of LEED by governments are interesting developments and have not yet achieved much scholarly attention. Adopting standards developed by non-governmental organisations appears to be an easy and cost-effective way for governments to introduce regulatory requirements quickly that may help to improve the environmental performance of the built environment. However, this strategy is not without risk. Governments need to be careful in adopting private regulations such as LEED criteria as a baseline for their own construction codes, or even supporting the use of these criteria. Private regulation emerges under a completely different set of accountability and legitimacy rules than public regulations. Although the administrative organisation behind LEED, the USGBC,

represents a wide range of stakeholders, governments included, it does not have the democratic legitimacy that governments normally have (Corbett & Muthulingam, 2007; Schindler, 2010; Schmidt & Fischlein, 2010). Further exploration regarding why governments assimilate and adopt LEED criteria is, of course, of interest. What are their experiences in doing so? Do they perceive any risks themselves? Do they experience pressure from the construction industry in doing so? These are but a few questions that future scholarship may wish to take up.

3.2.2 LEED included in other VEPS

LEED is also the benchmark for a number of other VEPs, at least in the United States. For instance, *revolving loan funds* are another currently popular approach to stimulating property owners to retrofit their existing buildings. These funds are a source of money that is normally made available to support small and medium development projects. In particular, these funds seek to provide loans to individuals, organisations or projects that do not qualify for traditional loans, for instance because they are considered too high a risk. The loans do not usually fund full projects, but are a bridge between the loans a borrower can obtain on the market and the funds needed for a project. The funds are *revolving* because when the loans are paid back to the central fund, it can issue new loans to other projects (Boyd, 2013; Indvik, Foley, & Orlowski, 2013).

Throughout the United States, over 80 revolving loan funds were recorded in 2013, comprising close to US$120 million (AASHE, 2013). Revolving loan funds are particularly popular with universities and other educational institutions in the United States (Flynn, 2011; Foley, 2011; Indvik et al., 2013). The *Billion Dollar Green Challenge* is the largest fund. This is a VEP that encourages educational institutions to invest a total of US$1 billion dollars in a self-managed revolving fund to finance energy efficiency upgrades in educational buildings (Green Billion, 2013). The challenge was launched in 2011. By the end of 2013, 41 institutions had committed themselves to the challenge and had invested close to US$80 million in the fund. By joining the challenge, participants not only find financial support for their projects, but are also provided with information and best practice guidelines on how to increase the (environmental) sustainability of their existing buildings (Sustainable Endowment Institute, 2012). Within the Green Challenge, it is the norm to achieve high levels of LEED certification (Flynn, 2011; Foley, 2011; Indvik et al., 2013).

Yet another approach aimed at increasing the environmental performance of buildings is the use of *green leases*. Green leases seek to address the split-incentive problem faced by

landlords and tenants. In a green lease, they can agree that the landlord will carry out certain retrofits, but only if the tenant agrees to an increase in rent or shares the 'profit' of the reduced energy costs with the landlord. They can agree that the tenant will only use specific interior designs that do not negatively affect the overall performance of the building, or that the tenant will use the building in an efficient and environmentally sustainable way. Green leases can help both the landlord and the tenant to come together and overcome existing split-incentive problems. In working together, they can reduce costs (Brooks, 2008). Green leases have received much attention in the construction industry and are currently being trialled in a range of countries (for an overview, see Green Lease Library, 2013). A typical example is the *Green Leasing Toolkit* in California in the United States (California Sustainability Alliance, 2009). The Toolkit is predominantly a website that brings together information on green leases. It explains the advantages of green leases, helps organisations to develop them, communicates policies on urban sustainability to the market and seeks to develop language for green leases. Within the Toolkit, LEED certification is actively promoted as a clear benchmark for landlords and tenants. For instance, a landlord may require a tenant to fulfil environmental criteria laid down in a lease by meeting a particular level of LEED certification for its office interiors.

These examples indicate a high level of trust in LEED among actors in the construction industry in the United States. They also confirm the arguments made in the previously discussed literature on the spill-over effects of VEPs, but in a slightly different way. LEED has clearly inspired other parties to develop and implement their own VEPs. This may result in an increased transition towards higher levels of environmental performance of the built environment. Yet the true value of VEPs that build on LEED is in question. Will they be able to overcome the problems that appear to be related to LEED? Will they be able to address different market segments that LEED has not yet been able to address? Or, will they do nothing more than strengthen the leadership of LEED in an otherwise negligible market of VEPs? These are again questions that future scholarship may wish to take up.

4 Conclusion

This article has sought to understand the role of VEPs in achieving transition to higher levels of environmental and resource sustainability in the built environment. It has critically studied LEED, the leading example of VEPs in this sector.

4.1 Direct outcomes

If LEED is viewed through the lens provided by the policy sciences and governance literature discussed, a multifaceted image comes to the fore. At first glance, LEED seems to be a successful VEP, possibly the world's most successful VEP for the built environment: the billions of square meters of LEED-certified space are astonishing. Yet when LEED-certified space built since 1993 is considered as a percentage of all of the built space in the United States, this success is reduced significantly and becomes almost negligible. In other words, the uptake of LEED over a period of more than 20 years is out of sync with the problems of unsustainability faced in the built environment.

This relatively poor overall performance of LEED is even more concerning given the poor performance of LEED-certified buildings that have been discussed in the literature. In line with the policy sciences and governance literature discussed, it appears that LEED participants (and their LEED-certified buildings) do not always outperform non-participants. This only raises further questions concerning the value of LEED in particular and VEPs more generally for the built environment.

4.2 Indirect outcomes

LEED has, however, achieved considerable indirect outcomes. It is followed in 135 countries and widely applied by governments in their construction regulations and policies. It has even become the benchmark for other VEPs. These developments further confirm the major part of the arguments put forward in the policy sciences and governance literature discussed. A VEP such as LEED may achieve more than 'just' the construction of a number of buildings. It may change mindsets, generate best practices and stimulate the market, which in turn may bring prices down. These indirect outcomes also bring to the fore questions concerning how LEED performs in these various countries and how it operates as a benchmark for other VEPs. Why does LEED show a relatively better performance in India than in the United States? Why do countries choose LEED over other building environmental assessment tools? Why do developers of VEPs choose LEED over developing their own criteria? What is the value of the indirect outcomes of LEED? These are again intriguing questions for future scholarship to explore.

The indirect outcomes uncovered also raise some concerns, particularly related to the uptake of LEED by governments and the adoption of LEED in statutory regulations. The difference between the accountability and legitimacy in the development of LEED criteria and that of governmental regulations is but one of many aspects that may need further scrutiny.

4.3 Restoring the balance in our thinking about VEPs

VEPs have the potential to generate change towards better environmental and resource performance in the built environment. But not too much should be expected from VEPs in the achievement of deep and far-reaching change of the built environment. The extant literature on VEPs from policy sciences and governance studies does not present a rosy picture of what VEPs may achieve. In this article, the perspective of this literature is largely confirmed by an assessment of one of the world's leading VEPs for the built environment: LEED. It goes without saying that there are many more VEPs in the world than LEED and other building environmental assessment tools (van der Heijden, 2014), but if this leading VEP shows such relatively poor performance, I am not hopeful about what VEPs more generally will achieve in improving the environmental and resource sustainability of the built environment.

By presenting an analytical lens for the assessment of VEPs provided by the policy sciences and governance literature and by a very critical assessment of a VEP that is often considered to be a good example of what has been achieved on a voluntary basis in terms of improved environmental and resource sustainability of the built environment, I hope to have provided an article that will be a step along the way to the restoration of balance in our thinking about VEPs for the built environment in general, and LEED and other benchmarking tools in particular.

Tables

Table 1 – a random sample of ten VEPs for the built environment from around the world

1200 Buildings (Melbourne, Australia)	Tripartite financing tool that funds retrofits of existing commercial property.
Amsterdam Investment Fund (Amsterdam, the Netherlands)	Revolving loan fund that issues loans to – among others – building developments and retrofits that seek to achieve high levels of environmental performance.
Better Building Partnership (Sydney, Australia)	Partnership between the City of Sydney and local commercial property owners committed to reducing their energy consumption.
Billion Dollar Green Challenge (United States)	US-wide programme that encourages colleges, universities and other non-profit institutions to invest a combined total of US$1 billion dollars in self-managed revolving funds to finance energy efficiency improvements.
BREEAM (BRE Environmental Assessment Method) (Global)	Best-of-class benchmarking tool for buildings. Aims to stimulate developers and property owners to build and retrofit buildings with high levels of environmental performance.
Density Bonuses (North Carolina, United States)	A number of jurisdictions in North Carolina provide density bonuses to builders who built or retrofit energy-efficient buildings.
Eco-Office (Singapore)	Best-of-class benchmarking tool for office tenants. Aims to improve the environmental sustainability of office tenants.
Green Building Index (Malaysia)	Malaysian best-of-class benchmarking tool for buildings (comparable to BREEAM, above).
GRIHA (Green Rating for Integrated Habitat Assessment) (India)	Indian best-of-class benchmarking tool for buildings (comparable to BREEAM, above).
Transition Towns (Global)	Global network that aims to mobilise community action and foster community engagement and empowerment around issues of climate change.

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References

AASHE. (2013). Campus Sustainability Revolving Loan Funds Database, 17 December 2013, from http://www.aashe.org/resources/campus-sustainability-revolving-loan-funds/

Alter, J. (2008). Slate on "Decidedly Dupable" LEED Retrieved 10 December 2013, from http://www.treehugger.com/sustainable-product-design/slate-on-decidedly-dupable-leed.html

Bailey, I. (2008). Industry Environmental Agreements and Climate Policy. Journal of Environmental Policy and Planning, 10(2), 153-173.

Baron, D. P., & Diermeier, D. (2007). Strategic Activism and Nonmarket Strategy. Journal of Economics and Management Strategy, 16, 599-634.

Baughn, C., Bodie, N., & McIntosh, J. (2007). Corporate Social and Environmental Responsibility in Asian Countries and Other Geographical Regions. Corporate Social Responsibility and Environmental Management, 14(4), 189-205.

Bischop, P., & Davis, G. (2002). Mapping Public Participation in Policy Choices. Australian Journal of Public Administration, 61(1), 14-29.

Blackman, A., Uribe, E., van Hoof, B., & Lyon, T. P. (2013). Voluntary environmental agreements in developing countries. Policy Sciences, 46(3), 335-385.

Borck, J., & Coglianese, C. (2009). Voluntary Environmental Programs. Annual Review of Environmental Resources, 34, 305-324.

Boyd, S. (2013). Financing and Managing Energy Projects Through Revolving Loan Funds. Sustainability 6(6), 345-352.

BRE. (2013). BREEAM user manual for the BREEAM In-Use Online System V2.0. Watford: BRE Global.

Brooks, M. (2008). Green Leases and Green Buildings. Probate & Property, 14(November/December), 23-26.

Bulkeley, H., & Betsil, M. (2005). Rethinking Sustainable Cities. Environmental Politics, 14(1), 42-63.

California Sustainability Alliance. (2009). Greening California's Leased Office Space. San Francisco: California Sustainability Alliance.

City of New York. (2005). Local Laws of the City of New York. No. 86. New York: City of New York.

Cole, R., & Valdebenito, M. J. (2013). The importation of building environmental certification systems. BRI, 41(6), 662–676.

Cooper, I., & Symes, M. (2009). Sustainable Urban Development. Volume 4. London: Routledge.

Darnall, N., & Sides, S. (2008). Assessing the Performance of Voluntary Environmental Programs. Policy Studies Journal, 36(1), 95-117.

de Leon, M. (2013). Constructing Green. In R. Henn & A. J. Hoffman (Eds.), Constructing Green. (pp. 333-340). Cambridge, MA: MIT Press.

DGNB. (2009). German Sustainable Building Certificate – Second English Edition. Stuttgart: German Sustainable Building Council.

DGNB. (2013). International application Retrieved 11 December 2013, from http://www.dgnb-system.de/en/system/international/

Dixon, T., Ennis-Reynolds, G., Roberts, C., & Sims, S. (2009). Is there a demand for sustainable offices? Journal of Property Research, 26(1), 61-85.

Dixon, T., Keeping, M., & Roberts, C. (2008). Facing the future. Journal of Property Investment & Finance, 26(1), 96-100.

Domask, J. (2003). From boycotts to global partnerships. In J. P. Doh & H. Teegen (Eds.), Globalisation and NGOs (pp. 157-186). Westport: Praeger Publishers.

Evans, M., & Davies, J. (1999). Understanding policy transfer: a multi-level, multi-disciplinary perspective. Public Administration, 77(2), 361-385.

Eichholtz, P., Kok, N., & Quigley, J. (2010). Doing Well by Doing Good? American Economic Review, 100, 2492–2509.

Flynn, E. (2011). Green Revolving Funds in Action. Cambridge, MA: Sustainable Endowments Institute.

Foley, R. (2011). Green Revolving Funds in Action. Cambridge, MA: Sustainable Endowments Institute.

Fowler, K. M., & Rauch, E. M. (2006). Sustainable Building Rating Systems. Richland: Pacific Northwest National Laboratory.

GBCA. (2012). A decade in green building. Sydney: Green Building Council of Australia.

GBCA. (2013). Valuing green. Sydney: Green Building Council of Australia.

Gifford, H. (2009). A Better Way to Rate Green Buildings. Northeast Sun, 27(1), 19-27.

Givens, J., & Jorgenson, A. (2013). Individual environmental concern in the world polity. Social Science Research, 42(2), 418-431.

Green Billion. (2013). The Billion Green Dollar Challenge Retrieved 17 December 2013, from http://greenbillion.org/

Green Lease Library. (2013). Green Lease Library Retrieved 12 December 2013, from http://www.greenleaselibrary.com/

HKGBC. (2013). Certification Retrieved 11 December 2013, from http://www.hkgbc.org.hk/eng/certification.aspx

Hoffman, A. J., & Henn, R. (2009). Overcoming the Social Barriers to Green Building. Organization & Environment, 32(4), 390-419.

Holley, C., Gunningham, N., & Shearing, C. (2012). The New Environmental Governance. London: Routledge.

Horvat, M., & Fazio, P. (2005). Comparative Review of Existing Certification Programs and Performance Assessment Tools for Residential Buildings. Architectural Science Review, 48(1), 69-80.

IEA. (2009). World Energy Outlook 2009. Paris: International Energy Agency/OECD.

IGBC. (2013). Indian Green Building Council Retrieved 25 December 2013, from http://www.igbc.in/site/igbc/index.jsp

Indvik, J., Foley, R., & Orlowski, M. (2013). Green Revolving Funds. Cambridge, MA: Sustainable Endowments Institute.

Jordan, A., Wurzel, R., & Zito, A. (2005). The Rise of New Policy Instruments in Comparative Perspective. Political Studies, 53(3), 477-496.

King, A. A., & Lenox, M. J. (2000). Industry Self-Regulation without Sanctions. Academy of Management Journal, 43(4), 698-716.

Knill, C. (2005). Introduction: Cross-national policy convergence: concepts, approaches and explanatory factors. Journal of European Public Policy, 12(5), 764-774.

Kollmuss, A., & Agyman, J. (2002). Mind the Gap. Environmental Education Research, 8(3), 239-260.

Lee, W. L., & Burnett, J. (2008). Benchmarking energy use assessment of HK-BEAM, BREEAM and LEED. Building and Environment Building and Environment, 43(11), 1882-1891.

Lenox, M. J., & Nash, J. (2003). Industry Self-Regulation and Adverse Selection. Bussiness Strategy and the Environment, 12(6), 343-356.

Lyon, T. P., & Maxwell, J. W. (2006). Greenwash. Ann Arbor: Ross School of Business.

Lyon, T. P., & Maxwell, J. W. (2007). Environmental Public Voluntary Programs Reconsidered. The Policy Studies Journal, 35(4), 723-750.

May, P., & Koski, C. (2007). State environmental policies. Review of Policy Research, 24(1), 49-65.

McManus, P. (2005). Vortex Cities to Sustainable Cities. Sydney: UNSW Press.

Morgenstern, R., & Pizer, W. (2007). Reality Check. Washington, DC: RFF Press.

Newsham, G., Mancini, S., & Birt, B. (2009). Do LEED-certified buildings save energy? Energy and Buildings, 41(8), 897-905.

Senate Bill 1597 / S.L. 2008-22 (2008).

Nwabuzor, A. (2005). Corruption and Development. Journal of Business Ethics, 59(1-2), 121-138.

Pérez-Lombard, L., Ortiz, J., González, R., & Maestre, I. R. (2009). A review of benchmarking, rating and labelling concepts within the framework of building energy certification schemes. Energy and Buildings, 41(3), 272.

Potoski, M., & Prakash, A. (2009). Voluntary Programs. Cambridge: MIT Press.

Schindler, S. B. (2010). Following the Industry's LEED. Florida Law Review, 62(2), 285-350.

Schmidt, T. M., & Fischlein, M. (2010). Rival private governance networks. Global Environmental Change, 20(3), 511-522.

Scofield, J. (2009). Do LEED-certified buildings save energy? Energy and Buildings, 41(12), 1386-1390.

Scofield, J. (2013). Efficacy of LEED-certification in reducing energy consumption and greenhouse gas emissions for large New York City office buildings. Energy and Buildings, 67, 517-524.

Seville, C. (2011). How to Cheat at LEED for Homes Retrieved 10 December 2013, from http://www.greenbuildingadvisor.com/blogs/dept/green-building-curmudgeon/how-cheat-leed-homes

Short, J., & Toffel, M. W. (2010). Making Self-Regulation More Than Merely Symbolic. Administrative Science Quarterly, 55(2), 361-396.

Sustainable Endowment Institute. (2012). Greening the Bottom Line. Cambridge, MA: Sustainable Endowment Insitute.

Todd, J. A., Pyke, C., & Tufts, R. (2013). Implications of trends in LEED usage. BRI, 41(4), 384-400.

USA Today. (2013, 13 June 2013). In U.S. building industry, is it too easy to be green? Retrieved 17 February 2014, from http://www.usatoday.com/story/news/nation/2012/10/24/green-building-leed-certification/1650517/

USGBC. (2010). Green Building Facts. Washington: US Green Building Council.

USGBC. (2013a). Incentives and financing Retrieved 12 December 2013, from http://www.usgbc.org/advocacy/priorities/incentives-financing

USGBC. (2013b, 3 May 2013). Infographic: LEED in the World Retrieved 10 December 2013, from http://www.usgbc.org/articles/infographic-leed-world

USGBC. (2013c). LEED for Existing Buildings. Washington, DC: U.S. Green Building Council.

USGBC. (2013d). USGBC History Retrieved 12 December 2013, from http://www.usgbc.org/about/history

van der Heijden, J. (2014) Governance for Urban Sustainability and Resilience. Cheltenham: Edward Elgar.

Walker, H., & Phillips, W. (2009). Sustainable procurement. International Journal of Procurement Management, 2(1), 41-61.

WGBC. (2013). The Business Case for Green Building. Toronto: World Green Building Council.

Wurzel, R., Zito, A., & Jordan, A. (2013). Environmental Governance in Europe. Cheltenham: Edward Elgar.

Yin, R. K. (2003). Case Study Research. Design and Methods (3 ed.). Thousand Oaks: Sage Publications.

Yudelson, J., & Meyer, U. (2013). The World's Greenest Buildings. Abingdon: Routledge.