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# **Does Increased Investment in Responsible Properties Lead to Better Corporate Performance?**

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# **Does Increased Investment in Responsible Properties Lead to Better Corporate Performance?**

## **Abstract**

This paper investigates the impact that ownership of eco-certified properties has on the corporate performance of U.S. REITs. Given the financial benefits associated with individual eco-certified properties, ownership of such properties within an overall real estate portfolio should translate into better corporate operational performance. Utilizing OLS with robust standard errors, we analyze the 2011 property holdings for 66 U.S. equity REITs to determine the effect that LEED and Energy Star property ownership has on each firm's funds from operation (FFO), and return on average assets (ROAA) in 2012. Indeed, we found that ownership of LEED certified properties had a positive impact on both FFO and ROAA, with ownership of Energy Star properties positively effecting FFO only.

## **1. Introduction**

For the past thirty years, many corporations have been increasingly focused not only on corporate financial performance (CFP) and the challenges associated with allocating scarce corporate resources, but also on advancing and promoting corporate social performance (CSP) or corporate environmental performance (CEP). As this effort by corporations has increased, so has the attempt by researchers to quantify the relationship between CSP and its implications for corporate profitability.

With regards to environmental impact and performance, the real estate sector is unique. In terms of environmental impact, buildings are the single largest energy consumer, responsible for an estimated 30 percent of the total greenhouse gas emissions, 39 percent of the total primary energy use, and 70 percent of the total electricity consumption in the United States (Nelson, 2007). From a performance standpoint, it has been estimated that energy costs are the "largest and most manageable operating expense for commercial properties", averaging about 30% of a building's total operating costs (Wiley et al., 2010, p.3). Thus, the level of energy use has considerable impact not only on the overall environment, but may also impact financial performance as well.

With the advent of eco-certification schemes for commercial property, such as LEED and Energy Star in the United States and BREEAM in the United Kingdom, there has been a metric by which we can attempt to determine some of the benefits of sustainably built and/or energy efficient real estate, and numerous studies have been undertaken to do so. However, most of these studies have predominantly addressed the impact of these properties at the individual property level, focusing on rental income and capital value, as well as the value of eco-certification from an investment perspective both in the United States (see: Miller et al., 2008, Dermisi, 2009, Pivo and Fisher, 2009, Eichholtz et al., 2010, Wiley et al., 2010, Das et al., 2011, Fuerst and McAllister, 2011, Harrison and Seiler, 2011, McGrath, 2013) and internationally (see Bowman and Wills, 2008, Lorenz and Lützkendorf, 2008, Newell et al., 2011). Overall, these studies have shown that there is a positive relationship between eco-certification and an individual property's financial performance. However, the question as to whether this translates into increased overall financial benefit to investors is only beginning to be examined. Initial evidence does suggest that investors do see the benefits of eco-certification, as evidenced by lower average capitalization rates, most specifically in the case of Energy Star labelled properties. Indeed, McGrath (2013) found that capitalization rates for properties purchased without the Energy Star certification and achieved certification after purchase were actually lower than those properties purchased with the Energy Star certification intact. This indicates that, for investors, the expected future benefits of eco-certification, as well as eco-certification itself, is expected to offset the expense involved in attaining certification.

So, with the research thus far indicating that there are overall property-specific benefits as well as perceived future benefits for investors associated with eco-certification, the question is to what degree, if at all, companies whose revenues are primarily derived from the ownership and management of properties, such as Real Estate Investment Trusts (REITs), would benefit from owning eco-certified properties. These benefits may manifest themselves in two ways. The first is through direct operational benefits such as lower operational costs, increased rental values, risk mitigation related to future environmental regulation and increasing energy costs, and higher property valuations. These benefits would be expected to translate into higher performance figures, such as

funds from operations (FFO) and return on assets (ROA). The second area of benefit may relate to the stakeholder theory of CSP whereby firms engaging in socially responsible behaviour may be rewarded with greater customer satisfaction, better employees, an enhanced corporate reputation, and greater access to financial markets (Marom, 2006). Indeed, studies such as that by El Ghoul, Geudhami, Kwok, & Mishra (2011) have also shown that firms with better CSR scores are able to obtain equity financing at lower cost. This aspect of stakeholder theory would be particularly important to a U.S. publicly-traded REIT given that their REIT status allows them to reduce or eliminate all corporation tax in exchange for distributing 90 percent of all taxable income to investors in the form of a dividend. Thus, unlike non-REITs who may choose to retain profits for use in future investment, REITs rely much more heavily on the marketplace to provide funding for major property or portfolio acquisitions.

Overall, based upon the building-specific benefits shown in the research discussed below, it is anticipated that the financial benefits associated with eco-certified properties should translate into better operational performance for those REITs with a greater proportion of eco-certified properties in their portfolio. Thus, this study seeks to examine the impact of corporate social performance, as defined by the levels of eco-certified properties held in a given REIT's overall portfolio, in the corporate financial performance of publicly traded U.S. REITs. Two measures of CFP are used: funds from operation (FFO), and return on average assets (ROAA), two widely accepted measures of REIT performance and in-line with previous research.

## **2. Background and Literature Review**

How does the social and/or environmental performance of a firm affect a company's financial performance? Over the last 30 years, there have been numerous studies in a variety of disciplines that have sought to determine the link between this aspect of CSP and CFP. Overall, the results are mixed, with some studies finding that CSP has a positive effect on CFP (see: King and Lenox, 2001, Hart and Ahuja, 1996, Konar and Cohen, 2001, Russo and Fouts, 1997, Earnhart and Lizal, 2007a, Salama, 2005), some

studies finding a negative relationship between CSP and CFP (see: Cordeiro and Sarkis, 1997, Sarkis and Cordeiro, 2001, Jaggi and Freedman, 1992, Stanwick and Stanwick, 1998), and there are still more studies where the results were inconclusive (see: Cohen et al., 1995, Earnhart and Lizal, 2007b, Wagner, 2005).

However, there have been numerous reasons found to account for the inconsistencies in results. Indeed, Orlitzky, Schmidt, & Rynes (2003) performed a meta-analysis on 52 studies using Hunter and Schmidt's (1990) statistical aggregation techniques. In this, they examined the relationship between corporate social/environmental performance and corporate financial performance and found that though there are positive financial benefits to good CSP, the measures used to determine CFP had an effect on results. Indeed, those studies that used accounting-based measures of CFP were more highly correlated to CSP than those that used market-based measures. Another study that sought to address inconsistent results in prior CSP/CFP research was undertaken by Horváthová (2010). The author also used meta-analysis in order to determine some of the underlying factors which would influence the observed variation within the empirical results. In their study, which focused on the link between environmental performance and corporate financial performance, they found that when studies simply examined correlation coefficients and portfolio studies, there was an increased likelihood of finding a negative link between CSP and CFP, and there was no effect on the outcome when panel analysis and multiple regression analysis was used, which suggests that there are unaccounted for omitted variable biases. Additionally, they found that the measure of financial performance did not affect results; rather, it was the type of environmental performance used, with qualitative measures of environmental performance being more likely to result in a positive impact on CFP. Additionally, the majority of the studies have also undertaken to study a cross section of industries, despite the fact that there are inherently both internal and external pressures that create a separate specialization of social interests unique to different industries (Griffin and Mahon, 1997).

## **2.1 Theoretical Perspective on CSP**

There are also multiple theories that attempt to explain the relationship between environmental performance and CFP. The neoclassical traditionalist view, such as that espoused by Friedman (1970) says that the mere presence of any corporate social responsibility indicates an agency problem within that firm. Indeed, agency theorists believe that the only responsibility that a company has is to make money and that allocation of resources to social areas adds costs and is contrary to this goal, thus it is not in the interest of investors. Indeed, it has been contended that industries with greater level of environmental compliance required are at a competitive disadvantage. Thus, the traditionalist view of economics would require that economic performance would decrease as environmental performance increases (Walley and Whitehead, 1994). However, stakeholder theorists believe that an organization can affect stakeholders in a positive or negative way and, conversely, stakeholders are also influential in helping or hindering a firm in reaching its aims. Freeman (1984, iv) defines stakeholders as “any group or individual who can affect, or is affected by, the achievement of a corporation’s purpose.” Thus, when a firm seeks to lower implicit costs, such as environmental or product quality costs, by means of socially irresponsible actions, the result is higher explicit costs, such as increased payments to bondholders or reduced access to capital markets, thereby placing the firm at a competitive disadvantage (Waddock and Graves, 1997). Additional benefits to those companies with positive stakeholder relations are thought to be greater customer satisfaction, the ability to attract and retain top quality employees, increased productivity and an enhanced overall corporate reputation (Marom, 2006).

## **2.2 CSP in Real Estate**

There has been very little research to the CSP of real estate companies. Indeed, a study by Sardinha, Reijnders, & Antunes (2011) examined the CSR practices of 23 companies with portfolios invested in the development and/or the management of shopping centres based in Australia, China, Europe or the United States. The authors developed a CSR evaluation framework in order to examine changes to CSR relevant

practices, processes, and management from 2004 to 2010. However, though the authors found that there has been an increase in transparency, CSR reporting, and greater adoption of environmental activities such as green building, the authors did not examine any correlation between CSR and CFP.

More recently, and most relevant to this study, are studies undertaken by Eichholtz, Kok, & Yonder (2012) and Ho, Rengarajan, & Lum (2013). The first, by Eichholtz, et al., (2012) examined both the operating and stock performance of various U.S. REITs over the 2000-2011 period. This was achieved by creating a dynamic 'greenness' scale that corresponds to both the number of green properties, and the total square footage of green properties owned by each REIT for the period 2000-2011. The authors also chose to attempt to account for endogeneity between environmental and financial performance by using a two-stage regression model using locational greenness and local environmental government policies as their instrumental variables. Overall, they found that an increased weighting of 1 percent for green properties results in an increase to ROA of around 3.5 percent for LEED certified properties and about 0.5 percent for Energy Star properties. Additionally, a 1 percent increase in LEED properties results in an increase in FFO/Total Revenue by 17 to 25 percent and a 1 percent increase in Energy Star properties increases the same financial measure by 2 to 7 percent overall. However, in examining the descriptive statistics, it would appear that the sample of REITs containing at least one LEED or Energy Star property had significantly lower means for both ROA and FFO/Total Revenue than the mean for all observations. Where the average ROA for the entire sample was 3.12, the mean for the LEED portfolios and Energy Star portfolios were 1.35 and 1.8 respectively. Similarly, means for FFO/Total Revenues were found to be 46.34, 31.76, and 32.18 for all portfolios, LEED portfolios, and Energy Star portfolios respectively.

Of note is that the authors state that all of the obtained data on all properties used was obtained from the SNL Real Estate database, and that they then used the property addresses found in SNL to find which properties are LEED and Energy Star. They further listed all of the REITs in the sample used along with the number of properties that are green as a percentage of each portfolio in Appendix A2. However, we found

that there were numerous REITs that, although listed among the 128 companies used in the analysis, did not appear to have listed addresses nor did they appear to have a common name by which to identify each property in SNL. Additionally, the authors also state that they use a weighted 'greenness measure' consisting of the percentage of eco-certified properties held as well as the percentage of square footage each portfolio held. Although the authors do provide data regarding the percentage of the portfolio regarding the number of properties, no data was given regarding the overall square footage of properties per portfolio. This is of note because it appears that there are variations within SNL regarding the reporting of total size (sq ft) per property, with some specific REIT types, such as residential, assisted living or hotel REITs, reporting size in terms of numbers of beds or rooms only. Thus, there may be a variation in the number of properties that have disclosed their total size in the terms of square footage, with some REITs having 0 percent such disclosure. This potential underreporting of property size, as well as the lack of individual identifiers for properties, could lead to inconsistencies in the 'greenness score' reported if.

The study by Ho, et al. (2013) examined the impact of 'green' developments on the operational and financial performance of REITs in Singapore through the use of ordinary least square (OLS) regression. Using the BCA Green Mark eco-certification scheme, the authors examined at the performance of three companies, two REITs (K-REIT and CMT) and one public trust (CDL), each of which was deemed to have the highest levels of green buildings in their portfolio relative to their peers in the years between 2007 and 2011. Similarly to Eichholtz et al. (2012), the authors use the accounting-based measures of ROA, and FFO/Total Revenue as their measures for operational performance. Their measures of 'green' were the percentage of the total square footage of certified properties contained in each portfolio, and a 'greenness score' that reflect a ratio of the sum of the BCA Green Mark score for all properties by the total number of certified properties. However, the sum of the BCA Green Mark scores had to be estimated as the actual number of points per property was unknown. Thus, given that each Green Mark award spans a range of points, the authors took the average number of points within each range per award and applied it to the property that had earned that award. Further, the 'greenness score' variable was dropped in the analysis of FFO/total

revenue, as the authors determined that it showed no explanatory significance for that specific dependent variable.

The author's sample consisted of 3 companies. From an initial sample of 23 public REITs listed in Singapore, 18 were identified as holding properties located in Singapore. Those 18 REITs were broken down by sector, and the total percentage of green buildings per sector was identified, ranging from 4.05 for 'others' to 61.90 percent for office. Based on these figures, those sectors that were deemed to hold an 'insignificant' percentage of green buildings (5.8 and 4.05) were excluded from the sample, with office and retail REITs remaining. Finally, the authors purposely selected just 2 REITs for inclusion in this study from the remaining sample of total possible REITs, one from each sector, as they were identified as being "leaders of sustainable developments in office and retail sector, respectively" with 100 percent green holdings for K-REIT and 50 percent for CMT. The rationale given for such a small sample was that it would enable them 'to conduct an in-depth investigation on the relationship between "greenness" of the REIT and its performance, across the different types of properties with the results being used as a reference for of the REITs in that same property sector.' As the authors further noted that the residential sector is becoming more receptive to green building, though there were no residential REITs, they included CDL as the green leader to represent of this sector.

The results reported were mixed and often contradictory. Though the relationship between the overall 'greenness score' and ROA was found to be positive for K-REIT, it was also found that a 1 percent increase s/f for green properties would result in a decrease in ROA by 44 percent. The results are reversed for CMT; though there is a negative relationship between ROA and the 'greenness score', a 1 percent increase in square footage for green properties would result in an increase in ROA of nearly 20 percent. Both of these results were significant at the 1 percent level. Additionally, it was found that a one point increase in the 'greenness scale' for K-REIT and CMT would correspond to a change in ROA of 0.04 and -0.28 percent, respectively. None of the results for CDL and ROA were statistically significant.

The results for FFO/Total Revenue, looking only at the percent of green square footage, having removed the greenness score for this model, were only statistically significant at the 10 percent level for K-REIT. In this, the authors found a weak but positive relationship between the amount of green square footage and FFO/Total Revenue, with a 1 percent increase in the former resulting in an increase of 0.0004 for the latter.

In examining this study, we acknowledge that having a small sample does not automatically imply that the result is not relevant. However, we note that in selecting just three specific companies that the authors felt would best support their desired research findings and excluding all other properties from the sample the results of this study might not accurately represent the overall market. Additionally, we found it unusual that the authors made the decision to remove a variable from the model simply because the result was not deemed to be statistically significant. However, the fundamental issue regarding the relevance of this study is that the basic principles of OLS regression are violated, given that the number of variables in the authors' model exceeds the number of observations in the sample.

### **3. Data and Methodology**

#### **3.1. Data**

REITs are unique in their relationship to the markets as compared to conventionally listed stocks. A company that possesses REIT status is required to pass 90 percent of its taxable income to shareholders in exchange for a reduction or elimination of federal income tax liability. Additionally, the purchase of many real estate assets often requires large amounts of capital. This combination of factors means that publicly-traded REITs are inherently more inclined to turn to the markets as a source of finance for many acquisitions than are companies without REIT status. One of the more important factors in a company's relationship with the market can be reflected in the levels and quality of its analyst coverage. Indeed, Chung & Jo (1996) found that analyst following had a

significant and positive impact on a firm's market value, as well as identifying benefits associated with a higher proportion of analyst coverage. Additionally, it has been found that analyst coverage has an impact both on a company's financing decisions, as well as the costs of raising capital (see: Chang et al., 2006, Bowen et al., 2008). Thus, though the National Association of Real Estate Investment Trusts (NAREIT) states that there are about 1,100 companies registered with the U.S. Internal Revenue Service (IRS) as having REIT status, the majority of those are private REITs.<sup>1</sup> Regarding U.S. domiciled, publicly-traded REITs, NAREIT identifies 137 listed REITs involved in the ownership and/or management of real estate (NAREIT, 2013)<sup>2</sup>. We have chosen our sample to reflect only those companies that have analyst coverage by Green Street Advisors. Green Street Advisors was chosen for a number of reasons, the first of which is the overall quality of their research, understood to be some of the best in the industry with both firm and analysts consistently earning top REIT analyst awards<sup>3</sup>. Additionally, Green Street Advisors have specialized in REIT research for over 25 years. This longevity is important and represents consistency in their coverage. Whereas other firms may choose to expand or contract their coverage of this asset class in relationship to overall firm performance or perceived market demand, real estate is, and has always been, the sole focus of Green Street Advisors. Thus, the breadth and quality of stocks covered has been both large and consistent. Indeed, we find that those REITs covered by Green Street Advisors have an average of 11 analysts covering them as opposed to an average of 4 analysts for those NAREIT listed REITs not covered by Green Street Advisors. Finally, because Green Street Advisors does not act as an investment bank,

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<sup>1</sup> U.S. Real Estate Investment Trust (REIT) status is a designation under U.S. federal tax law, internal revenue code 856 applying to "any corporation, trust or association that acts as an investment agent specializing in real estate and real estate mortgages". REIT status is voluntary and provides the benefit of reducing or eliminating corporate tax through the requirement that the REIT will distribute a minimum of 90 percent of taxable income to investors in order to eliminate double taxation of income to the owner. There is no requirement for a REIT to be a public entity, and the majority of those REITs electing to file IRS Form 1120-REIT to obtain this status are private entities.

<sup>2</sup> The 137 REITs identified refers only to those companies engaged in the ownership and management of physical real estate assets. Thus, mortgage REITs and those companies that focus primarily on real estate financing were not included in this number

<sup>3</sup> Two of Green Street Advisors analysts have been acknowledged in The Wall Street Journal's 2012 Best-On-The-Street, and Greenwich Associates has rated Green Street Advisors #1 in five categories including first place in Best Industry Knowledge and Best Original Research for past six years

it is able to avoid the potential conflicts of interest inherent in other Wall Street institutions evidenced in such research as that by Michael & Womack (1999).

Thus, our master sample comprised 77 U.S domiciled and listed REITs covered by Green Street Advisors. All financial data relating to our sample was obtained from the SNL Financial database. Those REITs without values for properties or tech REITs, such as American Tower Corporation (AMT), Coresite Realty (COR), Cubesmart (CUBE), Digital Realty Trust (DLR), DuPont Fabros Tech (DFT), and Healthcare REIT (HR), were removed from our sample. Additionally, those REITs without suitable information that was needed to identify properties for a majority of a total REIT portfolio, such as individual property addresses, were removed from the sample as without these identifiers, there would be no viable means to ascertain whether or not these properties were eco-certified. Those REIT portfolios whereby the information provided by SNL Financial was insufficient to adequately identify individual properties were as follows: Public Storage (PSA) with only 10.6% of its portfolio possessing street addresses, Ventas (VTR) with only 0.9% of its portfolio possessing street addresses, and Omega Healthcare (OHI) with 0% of its portfolio possessing street addresses and only 11% possessing even state-level identifiers. Although removing these REITs results in a smaller sample, given that the research revolves around the ability to identify which individual properties possess eco-certification, their inclusion would have resulted in inaccurate results. Finally, those REITs such as manufactured housing REITs Equity Lifestyle Properties (ELS) and Sun Communities (SUI) which, due to the nature of their real estate holdings, would not currently qualify for either LEED or Energy Star certification were removed from the sample. This resulted in an overall sample of 66 companies with levels of eco-certified properties ranging from 0 to 70 percent of their overall portfolio, in terms of number of properties<sup>4</sup>.

A review was then undertaken at the property level. As of the end of 2011, there were 465 properties listed as under development and 461 that were classified as land, 13 of the latter being listed as foreign. As these properties would not be contributing to REIT

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<sup>4</sup> See Appendix 1 for a list of all REITs used in the final sample along with the percentage of the portfolio (by number of properties), broken down by eco-certification type

revenue streams, they were removed from the sample. Additionally, given the fact that the eco-certification schemes being utilized in this study are U.S.-based schemes, the 590 properties listed as being located outside of the U.S.<sup>5</sup> were also removed from the sample, though it should be noted that they would be included in a corporation's financial reporting. Although there were only 5 REITs that had more than 10 percent in foreign holdings, we recognize that any foreign holding may affect firm performance. In some instances, the data provided by SNL Financial indicated a single data entry as a portfolio of properties rather than a selection of individual properties. These single entries were classified in our sample as one property given that the actual profile of that portfolio is unknown. This was a relatively rare occurrence, with only 48 entries (0.3% of our sample) being listed as such. However, this may result in an understatement of the overall numbers of eco-certified properties attributed to a given portfolio if numerous properties in the portfolio are eco-certified, or in an overstatement of the percentage of eco-certified properties if there were larger numbers of non-certified properties than accounted for.

The resultant 13,325 properties held by the remaining sample of 66 REITs were then matched against databases accessed on-line from the USGBC LEED and Energy Star websites. Given that we are trying to determine the impact of properties that had achieved eco-certification on REIT performance, we did not adopt the method previously used by Eichholtz et al. (2012) pertaining to their inclusion of properties that have only registered with LEED along with those that have achieved certification.

With regard to screening for eco-certification, if a property was identified as having achieved LEED certification only under the LEED Commercial Interior (LEED: CI), the property itself was not classified as LEED certified. This, because LEED: CI is the one LEED certification scheme that allows for individual tenant spaces within a given property to be certified, addressing such items as lighting, furnishings, flooring, and paints. Thus, this certification does not necessarily reflect the property as a whole, it is not a property-level certification, and such spaces may change upon vacancy.

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<sup>5</sup> See Appendix 2 for a list of those REITs with foreign holdings.

Another potential issue during the screening process is the fact that LEED allows for the confidential registration of a property with LEED by their owners. Confidential registration means that owners have chosen to withhold all identifying information about the property from the public. Thus, as we matched our sample of 13,325 properties against the LEED database of 9,556 U.S. certified properties (excluding those certified under the LEED: CI scheme), we were aware that 1,607 or 16.8 percent of those 9,556 total LEED certified properties were registered with USGBC LEED as 'confidential' as of mid-year 2012. As such, it is possible that some of the properties in our sample may have been registered as confidential and therefore would not be identified as being LEED despite achieving certification, which may affect our results.

In all, the above screening process resulted in an overall sample of 65 U.S. publicly-traded REITs in 10 sub-sectors. At the year-end 2011, the sample of 66 REITs consisted of 13,325 properties of which 585 were eco-certified<sup>6</sup>. Of these, 48 were dual certified, 478 had Energy Star certification only, and 66 had LEED certification only.

### **3.1.1. Model**

As outlined in the above literature review, the established theoretical model for research that is based upon the premise that a firm's CSP can influence CFP can be represented as follows:

$$CFP_{it} = (CSP_{it-1}, X_{it}, Z_{it})$$

Where:

$CFP_{it}$  is a measure of firm  $i$ 's financial performance for period  $t$ ,

$CSP_{it-1}$  is a measure of firm  $i$ 's corporate performance in terms of social responsibility for period  $t-1$ ,

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<sup>6</sup> See Appendix 1 for a list of all REITs in our sample and the relative percentage of eco-certified properties per portfolio

$X_{it}$ , is a combination of control variables that are relevant to firm  $i$ 's financial performance, such as size, risk, and R&D spending for period  $t$ ,

$Z_{it}$  are variables that identify the industry in which firm  $i$  operates for period  $t$

In accordance with the accepted theoretical model for determining the effect of CSP on CFP as defined above, we utilize an ordinary least squares (OLS) regression model that identifies the REIT specific variables believed to influence a firm's financial performance. OLS is the method most used in practice as it presents estimators of the mean regression function that have desirable statistical properties: estimators that are linear, unbiased, and have minimum variance. Additionally, based upon the results of performing a White test, outlined in more detail in the results section, we reject the null and further utilize regression with robust standard errors in order to correct for heteroscedasticity. Robust standard errors uses the Huber-White sandwich estimators and results in coefficients that are the same as ordinary OLS, but the standard errors take into account any minor issues with normality and heteroskedasticity. We further ran a Hausman test of endogeneity on our model, given that the question of endogeneity was addressed as a potential issue in the study by Eichholtz, et al. (2012). We did not find that the  $t$  variable of the residuals was significant, indicating that our eco-certification variable is not endogenous, and therefore there is no need for IV regression.

$$CFP_{it} = \beta_0 + \beta_1 EC_{it-1} + \beta_2 \ln GP_{it} + \beta_3 \ln DE_{it} + \beta_4 \ln RE_{it} + \beta_5 \ln RA_{it} + \beta_5 PT_{it} + \varepsilon_i$$

Where:

$CFP_{it}$  some measure of corporate financial performance, such as the log of FFO which reflects the REIT's financial performance or ROAA, which is a measure of the overall profitability of the assets of the firm,

$t$  is the end-of-year 2012

$EC_{t-1}$  represents the percentage of eco-certified properties possessing either dual certification, only LEED certification or only Energy Star certification held by a firm in time period  $t-1$ , or the end of 2011<sup>7</sup>. This, to account for the time lag between a firm's CSP and its effects on CFP. Alternatively, we also examined the effects of LEED and Energy Star certifications not accounting for dual certification for the same time period,

$\ln GP_t$  represents the log of the gross depreciable properties held by a firm in time period  $t$ . Gross depreciable property is defined as the undepreciated book value of all properties used to generate income, and excludes all properties under construction, land, or buildings held for sale, and land held for future development. This serves as a proxy for firm size,

$\ln DE_t$  is the REIT's debt to equity ratio in time period  $t$ , and represents firm risk,

$RE_t$  is the rental operating expense for a firm in time period  $t$  and serves to estimate R&D equivalent spending. This figure is used due to the fact that, unlike traditional R&D expenditures for a firm which could potentially result in the creation of technology that might give a firm a CSP advantage, rental operating expenses are those expenditures undertaken by a REIT that cover the operation and maintenance of all real estate assets. In this, they would encompass capital improvements such as property upgrades and eco-certifications,

$\ln RA_t$  is the log of the REIT's age as of time period  $t$  and serves as a proxy for the length of time a firm had both access to public capital, and received the tax benefits associated with U.S. REIT status,

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<sup>7</sup> Some consideration was given to using a combination of factors such number of properties as well as percentage of eco-certified square feet as was done in the paper by Eichholtz, et al., (2012). However, only 45 percent of the REITs in our sample had more than 50 percent of their properties listed with values for SF and only 55 percent had at least 75 percent of their properties listed with values for SF (see Appendix 3 for breakdown).

$PT_{it}$  is the percentage of each portfolio in the different property types,

$\varepsilon_i$  represents the error term

Typically, for the sample model, there would be a breakdown by industry to account for different levels in R&D spending and risk inherent in different types of industries. Given that all of the companies in our sample are in the same industry, real estate, we have chosen instead to use property type breakdowns as our ‘industry’ variable<sup>8</sup>. Additionally, we note that though location effects in themselves should not affect the actual financial performance of a REIT. However, given the number of properties and their dispersion throughout the United States (2,654 cities in all states), including locational factors would only be possible through the use of an extremely broad definition of location, such as northeast, midwest, etc. Given the unique characteristics of each market, much less the variations between sub-markets, we feel that the use of such a broad category of locations would not serve to add value to our model. Although we also understand that market-specific regulation related to LEED and/or Energy Star certification should also not affect the actual performance of a REIT, we do acknowledge that it may be possible for such regulation to impact the certification levels for a REIT if said REIT was concentrated solely in these markets. However, only 1 of the REITs in our sample (MPG) is highly concentrated in one of these areas (LA County, CA). Given that regulation in this area did not come into effect until 2010 and only pertains to the issuance of new building permits and, given that MPG is over 10 years of age, we believe that the impact of regulation on the performance of this REIT would be nominal<sup>9</sup>.

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<sup>8</sup> See Appendix 4 for a breakdown by use as well as the consolidated use list, overall numbers of properties per use, and eco-certified properties per use

<sup>9</sup> See Appendix 5 for a breakdown of the number of properties held in regulated areas as well as information regarding the actual regulation

## 4. Results

### 4.1. Descriptive Statistics

**Table I**

	Summary of REITs		Summary of Properties Held By REITs	
	# Portfolio EC Properties 2011		Size (S/F)*	Occupancy %**
<b>Dual Certified</b>				
Mean	0.62	615,146	93	
Std. Dev.	1.72	569,302	11	
Min	0	73,583	39	
Max	10	2,502,000	100	
Obs	66	46	46	
<b>ES Only</b>				
Mean	6.30	274,581	89	
Std. Dev.	13.35	355,541	14	
Min	0	2,039	0	
Max	64.18	2,685,000	100	
Obs	66	439	399	
<b>LEED Only</b>				
Mean	0.72	295,780	89	
Std. Dev.	1.65	481,627	27	

Min	0	19,000	0
Max	8.89	3,553,000	100
Obs	66	60	60
<b>Non-EC</b>			
Mean		231,448	92
Std. Dev.		282,678	16
Min		860	0
Max		3,282,200	100
Obs		8,485	7,916
<p>* Only 68% of the properties listed in our sample had data for property SF for year ending 2011. Additionally, those entries identified as portfolios (0.3% of the number of properties with SF in 2011) were removed from our size calculations.</p> <p>**Only 63% of our 2011 sample had occupancy figures.</p>			

Table I illustrates the average levels of eco-certification within our sample of portfolio for the year ending 2011, as well as presenting statistics on the overall sample composition relative to size and occupancy. The average percentages of eco-certified properties held are highest for Energy Star only properties at roughly 6.30 percent, followed by LEED only properties at around 0.72 percent, and dual certified properties in the region of 0.62 percent. This may be, in part, due to the relatively low number of LEED certified properties overall relative to number of properties that have achieved Energy Star certification. In examining the mean size for the properties in our sample in terms of s/f reported<sup>10</sup>, dual certified properties were, on average, more than twice the size of LEED only properties, Energy Star only, and non-certified properties at means of 615,146; 295,780; 274,581; and 231,4483 sf, respectively. The overall figures for occupancy<sup>11</sup> show that dual certified properties have the greatest level of occupancy at 93 percent, followed closely by non-eco-certified properties at 92 percent and then a consistent 89 percent for both LEED only and Energy Star only properties.

**Table II**

All			Dual			LEED Only			ES Only		
Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs

<sup>10</sup> For year-end 2011, only 68% of the sample properties had reported data on size, so this data may or may not accurately reflect the true nature of the sample. See Appendix 11 for details

<sup>11</sup> Only 63% of the properties in the 2011 sample had reported occupancy figures

<u>Dependent Variables</u>												
FFO	293,539	405,214	66	322,089	248,507	14	256,219	208,510	19	271,953	283,588	29
ROAA	2.38	3.15	66	3.64	5.04	14	2.73	1.73	19	2.36	3.97	29
<u>Control Variables</u>												
Gross Dep. Prop.	6,319,508	6,308,405	66	6,080,719	4,831,752	14	5,814,510	5,586,912	19	6,456,363	5,543,891	29
Rent Oper. Exp	258,878	254,938	61	294,735	268,955	14	268,269	294,335	18	253,008	230,046	26
Debt/Equity	1.34	0.76	64	1.23	0.38	13	1.08	0.46	19	1.10	0.4	28
Age	19	11	66	20	11	14	19	10	19	17	10	29

In Table II, we illustrate the control variables for our sample along with the financial variables used as our dependent variables. The figures for dual, LEED Only, and Energy Star only are determined by using all REITs that have at least one property in each category. Using gross depreciable property, or the undepreciated book value of all properties used to generate income, excluding properties under construction, land, or buildings held for sale, as our proxy for size, we see that the average REIT in our sample has 6,319,508 in gross depreciable properties. However, the range (not shown) is quite large. Indeed, the largest REIT in our sample is Simon Property Group (SPG) which with 33,922,858 in gross depreciable properties is nearly one and a half times larger than the sample's next largest portfolio, General Growth Properties (GGP) who has 23,085,329. Additionally, overall, 70 percent of the portfolios in our sample are below the mean. It is also of note that the size of REITs with at least one dual certified property or at least one LEED certified properties is lower than that of the overall mean at 6,080,719 and 5,814,518, respectively. However, the average size of those REITs with at least one Energy Star property is somewhat larger than that of the overall sample at 6,456,363. The mean reported rental operating expense, our proxy for R&D spending, is \$258,878<sup>12</sup>. In this case we see that the mean rental operating expense for all portfolios containing eco-certified properties, excepting Energy Star only, is larger than that of the overall sample. Indeed, dual portfolios are nearly 14 percent greater than the overall sample, which is interesting given the fact that the overall size in gross depreciable properties is lower. LEED only properties also have less in gross depreciable properties but greater rental operating expenses. This may be related to

<sup>12</sup> All financial numbers reported in monetary terms are (\$000)

the cost of obtaining LEED certification. The opposite is true for Energy Star only properties which have more in gross depreciable properties and overall lower rental operating expenses. This, however, is not unexpected given the impact of energy costs. Looking at the mean debt to equity ratio, which we use as our proxy for risk, we see that none of the eco-certified portfolios has a ratio greater than the overall sample of portfolios with the overall mean debt/equity ratio being between roughly 9 and 21 percent greater than the eco-certified portfolios. The average age of the REITs in our overall sample is 19 years, and is relatively consistent across all portfolios with Energy Star only portfolios being the youngest at an average age of 17 years. However, within the overall sample it should be noted that there are 7 of the companies being under 5 years of age which would mean that they have been operating only within the environment of the financial crisis.

In relation to our dependent variables that represent different measures of corporate financial performance, funds from operations (FFO) are typically the most accepted measure of a REIT's operating performance. Within our overall sample, the mean FFO figure was \$293,539. Simon Property Group (SPG) was at the top end of the spectrum with figures that were nearly two and a half times greater than the next largest reporting REIT (HCP, Inc.) with two REITs in the sample, FCH and SHO, reported negative FFOs for the year ending 2012. Dual portfolios had a mean FFO figure that was higher than the overall mean by nearly 10 percent. However, both LEED only and Energy Star only portfolios have mean FFO figures that are lower than the overall mean by with mean FFO figures that are between roughly 13 and 7 percent lower, respectively. This is not unexpected for the LEED only portfolios, given the figures for gross depreciable properties and rental operating expense, but it is interesting to note regarding the Energy Star only portfolios. Finally, the figures for return on average assets (ROAA) which, simply stated, is the net income divided by average assets reported as a percentage and is a measure of how well a company's assets perform, resulted in a mean of 2.38 with MPG Office Trust (MPG) posting a high figure of 19.8 which is well above the next highest reported figure of 6.90 by Kilroy (KRC). All eco-certified portfolios except Energy Star only, which is only 0.008 percent lower than the mean,

outperformed the overall mean in this category. Additionally, 13 REITs in our sample reported negative ROAA figures for the year ending 2012. Overall, it would appear that those REITs with dual certified properties in their portfolios tend to report greater performance for both FFO and ROAA, while Energy Star only REITs slightly underperform, and the results for LEED only being mixed.

## **4.2. OLS Regression Results**

In examining the effects that eco-certified properties might have on the overall rental performance of U.S. publicly-traded REITs, with the general hypothesis being that the greater the percentage of eco-certified properties held in a portfolio, the better a company's corporate financial performance would be, robust OLS regressions were run using the model outlined above but utilizing two unique measures of corporate financial performance. These measures are FFO, and ROAA. Additionally, though we feel that dual certification is a designation unto itself, we have also run our model using just the Energy Star and LEED categories. We do this so that our results may be compared to those in the existing literature as well as expanding the existing scope of research to encompass those properties that have achieved dual certification.

Our first iteration of the model looked at the effects of eco-certification on FFO using 2 definitions of eco-certification: Energy Star and LEED. We utilize FFO as a measure of how well the REIT performs. A summary of these results can be found in Figure I. This regression, based on 59 observations, has an extremely high degree of explanatory power, accounting for approximately 89% of the variation in FFO. The control variable for rental operating expense is significant to the 1 percent level, as are the location variables 'healthcare', 'retail', and 'self storage'. Additionally, property types 'assisted living' and 'industrial' are significant at the 3 and 5 percent level, respectively and all of our property type variables all exhibit positive signs. All control variables, with the exception of debt/equity and age, also exhibit positive signs. Indeed, it would be

expected that an increase in size, as measured by gross depreciable property, would result in an increase in FFO. Likewise, it would be expected that an increase in FFO would potentially result in an increase in rental operating expense. Regarding our eco-certification variables, we see that a 1 percent increase in LEED properties indicate that FFO would increase by 4.2 percent, significant at the 10.4 percent level. Although only statistically significant at the 15 percent level, our model indicates that a 1 percent increase in Energy Star properties would result in a 0.7 percent increase in FFO.

**Figure I: FFO, LEED, & Energy Star**

Linear regression		Number of obs = 59				
		F( 12, 46) = 5669.19				
		Prob > F = 0.0000				
		R-squared = 0.8931				
		Root MSE = .38377				
FFOln	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
LEED11	.0416936	.0251339	1.66	0.104	-.0088983	.0922854
ES11	.0072219	.0047422	1.52	0.135	-.0023237	.0167675
GDP12ln	.229439	.1318679	1.74	0.089	-.0359973	.4948753
RentOE12ln	.7656683	.1017693	7.52	0.000	.5608174	.9705192
DE12ln	-.0057927	.1216346	-0.05	0.962	-.2506304	.239045
Age12ln	-.017131	.08539	-0.20	0.842	-.1890121	.1547501
AssistedLiving	-.0080106	.0031657	-2.53	0.015	-.0143828	-.0016385
HealthCare	.0494302	.0037441	13.20	0.000	.0418937	.0569666
Industrial	.0063149	.0028953	2.18	0.034	.0004869	.0121429
Residential	.0029494	.0026856	1.10	0.278	-.0024563	.0083551
Retail	.0069844	.0026089	2.68	0.010	.001733	.0122358
SelfStorage	.0070057	.0025534	2.74	0.009	.0018661	.0121454
_cons	-1.034963	1.298211	-0.80	0.429	-3.648125	1.5782

If we further break down our portfolios based upon dual certification, LEED only, and Energy Star only, we see similar results to the above model, specifically regarding our eco-certification variables LEED only and Energy Star only. The results of this iteration, shown in Figure II, indicate that a 1 percent increase in LEED only and Energy Star only properties would result in a 5.37 percent and 0.82 percent increase in FFO, respectively, with LEED only being significant at the 5 percent level and Energy Star only at the 10 percent level. This is an interesting result for LEED properties, given that the descriptive statistics indicate that the average FFO for portfolios with LEED in them are lowest of all four categories: total sample, LEED, Energy Star, and dual certified. Our results for dual

certified properties, although not statistically significant, also indicate that an increase in these properties would result in an increase in FFO of 4.17 percent. Overall, the model again exhibits an extremely high r-squared value of 0.90 with all control variables and location variables all exhibiting the same signs and levels of significance as in the previous model.

**Figure II: FFO, Dual, LEED Only, & Energy Star Only**

Linear regression	Number of obs =	59
	F( 13, 45) =	5359.48
	Prob > F =	0.0000
	R-squared =	0.8949
	Root MSE =	.38482

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
FFOln						
Dual11	.0388189	.0509931	0.76	0.450	-.0638866	.1415243
LEED011	.0536565	.0257053	2.09	0.043	.0018834	.1054295
ESO11	.008252	.0049462	1.67	0.102	-.00171	.0182141
GDP12ln	.2503003	.1348314	1.86	0.070	-.021264	.5218646
RentOE12ln	.7567124	.1030718	7.34	0.000	.5491151	.9643097
DE12ln	-.0119544	.1218143	-0.10	0.922	-.257301	.2333922
Age12ln	-.0226893	.085233	-0.27	0.791	-.1943573	.1489788
AssistedLiving	-.0074735	.0034037	-2.20	0.033	-.0143288	-.0006182
HealthCare	.0494611	.0036129	13.69	0.000	.0421843	.0567379
Industrial	.006581	.002961	2.22	0.031	.0006172	.0125448
Residential	.0032833	.0027319	1.20	0.236	-.002219	.0087855
Retail	.0073213	.0026416	2.77	0.008	.0020008	.0126419
SelfStorage	.0073601	.0025849	2.85	0.007	.0021539	.0125662
_cons	-1.266765	1.346756	-0.94	0.352	-3.979271	1.445741

**Figure III: ROAA, LEED, & Energy Star**

Linear regression	Number of obs =	59
	F( 12, 46) =	487.30
	Prob > F =	0.0000
	R-squared =	0.3837
	Root MSE =	1.8792

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
ROAA						

LEED11		.2461345	.0809007	3.04	0.004	.0832899	.4089791
ES11		-.0221785	.015181	-1.46	0.151	-.0527363	.0083793
GDP12ln		-.9228932	.585469	-1.58	0.122	-2.101381	.2555947
RentOE12ln		1.209955	.3964486	3.05	0.004	.4119455	2.007965
DE12ln		-.6895181	.5584833	-1.23	0.223	-1.813687	.4346506
Age12ln		.1966853	.3466269	0.57	0.573	-.5010385	.894409
AssistedLiving		-.0533864	.0106061	-5.03	0.000	-.0747355	-.0320374
HealthCare		.1186628	.0121031	9.80	0.000	.0943004	.1430252
Industrial		-.0136231	.0109335	-1.25	0.219	-.0356312	.0083849
Residential		.0104127	.0093058	1.12	0.269	-.0083189	.0291444
Retail		.003149	.0097692	0.32	0.749	-.0165154	.0228134
SelfStorage		.02995	.0080751	3.71	0.001	.0136957	.0462043
_cons		.9763402	5.959446	0.16	0.871	-11.0194	12.97208

In Figure III, we see the results of the model when we use ROAA as our measure of CFP. ROAA is typically used as an indicator of how well a firm's assets are performing and is calculated by taking net income and dividing it by the average of the total assets. In this iteration, the explanatory value of 38 percent for our model is considerably lower than in the iteration examining FFO. Additionally, none of the control variables excepting rental operating expense, which is statistically significant at the 1 percent level, is statistically significant. However, property types 'assisted living', healthcare', and 'self storage' are all significant at the 1 percent level. The results for gross depreciable property are extremely interesting as we see that this proxy for size exhibits a negative sign to the coefficient, although the result is not significant and the confidence interval does allow for the possibility that there may still be a positive relationship between size and ROAA. This result indicates that a larger portfolio does not necessarily represent an efficient use of the underlying assets. Equally interesting is the result for rental operating expense. Significant at the 1 percent level, this result indicates that a 1 percent increase in rental operating expense would correlate to a 12.1 percent increase in ROAA. Thus, it may be that improving properties, be it through applying principals associated with eco-certified properties or not, a company would achieve greater efficiencies of its assets. Indeed, looking at our eco-certification variables, we find that the LEED result indicates that a 1 percent increase in LEED properties would result in an increase in ROAA of 24.6 percent. Interestingly, in regards to Energy Star only properties, prior research at the property-level (addressed in the literature review) indicates that the rental premiums exhibited by Energy Star properties would be positive, albeit lower than LEED certified properties. Thus, it is somewhat unexpected that the coefficient for Energy Star only properties indicates that there may be a negative relationship between increased levels of these properties and ROAA.

### Figure IV: ROAA, Dual, LEED Only, & Energy Star Only

Linear regression

Number of obs = 59  
 F( 13, 45) = 431.60  
 Prob > F = 0.0000  
 R-squared = 0.3812  
 Root MSE = 1.9037

ROAA	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
Dual11	.2529389	.2344586	1.08	0.286	-.219285 .7251628
LEEDO11	.2209695	.1284888	1.72	0.092	-.0378203 .4797592
ESO11	-.0271648	.0252414	-1.08	0.288	-.0780035 .0236739
GDP12ln	-.929868	.6199561	-1.50	0.141	-2.178524 .3187877
RentOE12ln	1.22411	.406948	3.01	0.004	.4044747 2.043745
DE12ln	-.6933685	.5673935	-1.22	0.228	-1.836158 .4494206
Age12ln	.1558955	.3491493	0.45	0.657	-.5473273 .8591183
AssistedLiving	-.0544588	.0110172	-4.94	0.000	-.0766485 -.0322691
HealthCare	.1186369	.0124007	9.57	0.000	.0936606 .1436133
Industrial	-.0139562	.0112429	-1.24	0.221	-.0366005 .008688
Residential	.0098613	.0100235	0.98	0.330	-.0103271 .0300497
Retail	.0025167	.0107815	0.23	0.816	-.0191982 .0242317
SelfStorage	.0291412	.0093413	3.12	0.003	.010327 .0479555
_cons	1.087483	6.579782	0.17	0.869	-12.16488 14.33984

Finally, looking at the results of our model that examines dual, LEED only, and Energy Star only certifications in terms of ROAA, illustrated in Figure IV, we again see consistencies in our results. Our R-squared is again 38 percent, and property types and control variables that were significant at the 1 percent level are again such. Our eco-certification variables show that, again, the coefficient for Energy Star only properties exhibits a negative sign. The result for Energy Star properties is interesting given that our descriptive statistics indicate that portfolios that include Energy Star properties tend to have the highest gross depreciable property figures and the lowest rental operating expense numbers. The coefficients for both dual and LEED only are positive, with

LEED only indicating that a 1 percent increase would increase ROAA by 22.1 percent, significant at the 10 percent level.

## **5. Conclusions**

Given the recent focus on the performance of eco-certified properties in the rental and sales markets, this study sought to determine whether the increased ownership of such properties in a portfolio would translate into an increase in overall financial performance for a company. Although many factors contribute to the overall performance of a firm, REITs whose core business is the ownership and operation of real estate would look to the characteristic of their underlying assets in order to help effect positive performance results. The results of this study indicate that eco-certified properties do, indeed, have a positive impact on the overall performance of the firm. Using a variable breakdown of just LEED and Energy Star, we see that both LEED and Energy Star have a positive effect on FFO. Indeed, increased ownership of LEED properties increases firm performance by 4.2 percent, with an increase in Energy Star properties having a much lower impact of just 0.7 percent. LEED properties are also seen to have the greatest impact on performance when we isolate LEED only properties from those with dual certification; that is both LEED and Energy Star. In this instance, we find that ownership of LEED only properties results in an increase in FFO of 5.4 percent. Segregating Energy Star from dual also increases the impact of Energy Star only properties to 0.8 percent. Although not statistically significant, when we examine dual certified properties, we also find that they have a positive impact on FFO by 3.9. Thus, overall, with varying degrees of significance, we see that eco-certified properties in general have a positive effect on overall firm performance.

When we examine the results for ROAA, which measures how well the underlying assets within the firm are performing, the results are not so evident. In our two eco-certification variable model, LEED again performs well, increasing ROAA by 24.6

percent. However, although not significant, the coefficient for Energy Star is negative, indicating that an increase in these properties would correspond to a decrease in ROAA of 2.2 percent. When we examine the three eco-certified variables, the results are similar, with LEED only increasing ROAA by 25.3 percent. Again, although not statistically significant, we note a positive impact from dual certified properties of 25.3 percent, while Energy Star only properties again indicate a negative influence.

As we have seen, there appears to be increased benefit to both overall firm performance and asset performance associated with the increased ownership of LEED properties. This result is in-line with prior research at the individual property level which has shown that the overall rental premium for LEED properties is greater than it is for Energy Star properties. Although such research has also shown that there are also rental premiums typically associated with Energy Star properties, the results in this study are somewhat mixed, with indications that Energy Star properties contribute positively to overall firm performance but that they also seems to indicate a negative impact on average asset performance. Overall, it is understood that, as a percentage of an overall portfolio, the number of eco-certified properties is still relatively low. Although as eco-certified properties become a more predominant part of REIT portfolios the results found in this study may be mitigated, currently, the scope for expansion in this area is great and would appear to provide an opportunity for outperformance. And although it is unclear as to why different types of eco-certification seems to result in a difference in asset performance, it is evident that by owning eco-certified properties of any type, there is value in these properties relative to the key measure by which REITs are assessed: FFO.

## Appendix

### A.1. Master Sample with Percent of Portfolio (No. Properties) Eco-Certified

Percent Eco-Certified Properties per Portfolio EY2011						
GreenStreet REIT	SYMBOL	Dual Certified	LEED Only	Energy Star Only	LEED	Energy Star
AMERICAN ASSETS TRUST	AAT	0.00	4.55	9.09	4.55	9.09
AMERICAN CAMPUS COMM	ACC	0.00	0.00	0.00	0.00	0.00
ASSOCIATED ESTATES	AEC	0.00	0.00	0.00	0.00	0.00
AIMCO	AIV	0.00	0.00	0.00	0.00	0.00
ACADIA REALTY TRUST	AKR	0.00	1.47	0.00	1.47	0.00
ALEXANDRIA REAL ESTATE	ARE	0.00	1.49	0.00	1.49	0.00
AVALONBAY	AVB	0.00	1.69	0.00	1.69	0.00
BRANDYWINE REALTY	BDN	1.59	0.00	31.47	1.59	33.07
STRATEGIC HOTELS	BEE	0.00	0.00	7.14	0.00	7.14
BIOMED REALTY TRUST	BMR	0.00	5.26	1.05	5.26	1.05
BRE PROPERTIES	BRE	0.00	2.60	0.00	2.60	0.00
BOSTON PROPERTIES	BXP	6.11	0.00	35.11	6.11	41.22
CBL & ASSOCIATES	CBL	0.00	0.00	0.00	0.00	0.00
CAMPUS CREST COMM	CCG	0.00	0.00	0.00	0.00	0.00
MACK-CALI REALTY	CLI	0.36	0.00	12.77	0.36	13.14
COLONIAL PROPERTIES	CLP	0.00	0.00	0.81	0.00	0.81
CAMDEN PROP TRUST	CPT	0.00	0.00	0.00	0.00	0.00
COUSINS PROPERTIES	CUZ	2.94	5.88	11.76	8.82	14.71
DCT INDUSTRIAL TRUST	DCT	0.00	0.00	0.00	0.00	0.00
DDR CORP	DDR	0.00	0.00	0.00	0.00	0.00
DOUGLAS EMMETT	DEI	0.00	0.00	64.18	0.00	64.18
DUKE REALTY	DRE	0.28	0.69	2.48	0.96	2.75
DIAMONDROCK HOSP	DRH	0.00	0.00	9.52	0.00	9.52
EDUCATION REALTY TRUST	EDR	0.00	0.00	0.00	0.00	0.00
EASTGROUP PROPERTIES	EGP	0.00	0.00	0.00	0.00	0.00
EQUITY RESIDENTIAL	EQR	0.00	0.00	0.00	0.00	0.00
EQUITY ONE	EQY	0.00	0.00	0.00	0.00	0.00
ESSEX PROPERTY	ESS	0.00	0.00	0.00	0.00	0.00
EXTRA SPACE STORAGE	EXR	0.00	0.00	0.00	0.00	0.00
FELCOR LODGING TRUST	FCH	0.00	0.00	0.00	0.00	0.00

FIRST INDUSTRIAL REALTY	FR	0.00	0.00	0.30	0.00	0.30
FEDERAL REALTY	FRT	0.00	0.00	0.00	0.00	0.00
GENERAL GROWTH	GGP	0.00	0.00	0.00	0.00	0.00
GLIMCHER REALTY TRUST	GRT	0.00	0.00	0.00	0.00	0.00
HEALTH CARE REIT	HCN	0.00	0.00	0.00	0.00	0.00
HCP, INC.	HCP	0.00	0.00	0.45	0.00	0.45
HIGHWOODS PROPS	HIW	0.32	0.32	23.79	0.32	23.79
HOME PROPERTIES	HME	0.00	0.00	0.00	0.00	0.00
HOST HOTELS	HST	0.00	0.00	8.74	0.00	8.74
KIMCO REALTY	KIM	0.00	0.00	0.13	0.00	0.13
KILROY REALTY	KRC	3.70	0.00	19.44	3.70	23.15
LASALLE HOTEL PROP	LHO	0.00	0.00	2.63	0.00	2.63
LIBERTY PROP TRUST	LRY	1.36	1.51	11.31	2.87	12.67
MAA	MAA	0.00	0.00	0.00	0.00	0.00
MACERICH	MAC	0.00	0.00	0.00	0.00	0.00
MPG OFFICE TRUST	MPG	10.00	0.00	60.00	10.00	70.00
CORPORATE OFFICE PROP	OFC	0.44	8.89	0.89	9.33	1.33
PIEDMONT OFFICE REALTY	PDM	2.56	1.28	47.44	3.85	50.00
PEBBLEBROOK HOTEL	PEB	0.00	0.00	0.00	0.00	0.00
PENNSYLVANIA REIT	PEI	0.00	0.00	0.00	0.00	0.00
PROLOGIS	PLD	0.00	0.22	0.22	0.22	0.22
POST PROPERTIES	PPS	0.00	0.00	0.00	0.00	0.00
PS BUSINESS PARKS	PSB	0.00	1.89	0.94	1.89	0.94
REGENCY CENTERS	REG	0.00	0.59	0.00	0.59	0.00
RLJ LODGING TRUST	RLJ	0.00	0.00	1.42	0.00	1.42
RETAIL OPP INVTS	ROIC	0.00	0.00	0.00	0.00	0.00
ROUSE PROPERTIES	RSE	0.00	0.00	0.00	0.00	0.00
SUNSTONE HOTEL INV	SHO	0.00	4.17	20.83	4.17	20.83
TANGER FACTORY	SKT	0.00	2.44	0.00	2.44	0.00
SL GREEN REALTY	SLG	2.44	0.00	31.71	2.44	34.15
SIMON PROPERTY GROUP	SPG	0.00	0.00	0.00	0.00	0.00
TAUBMAN CENTERS	TCO	0.00	0.00	0.00	0.00	0.00
UDR, INC.	UDR	0.00	1.55	0.00	1.55	0.00
VORNADO	VNO	5.58	1.29	12.02	6.87	17.60
WASHINGTON REIT	WRE	2.94	0.00	25.00	0.00	25.00
WEINGARTEN REALTY	WRI	0.00	0.00	0.00	0.00	0.00

**A.2. REITs with Foreign Holdings and the Percent of Foreign Holdings Per Overall Portfolio (No. Properties)**

<b>REIT</b>	<b>No. Foreign Properties</b>	<b>No. U.S. Properties</b>	<b>% Portfolio in Foreign Properties</b>
AIV	2	264	0.75%
ARE	14	134	9.46%
BMR	1	96	1.03%
CBL	1	154	0.65%
DCT	8	234	3.31%
DDR	25	435	5.43%
FR	1	657	0.15%
GGP	18	143	11.18%
HCN	45	923	4.65%
HCP	1	929	0.11%
KIM	155	794	16.33%
LRY	22	686	3.11%
PLD	250	459	35.26%
SKT	6	41	12.77%
SPG	34	328	9.39%
TCO	4	24	14.29%
VNO	3	241	1.23%

### A.3. Breakdown, By Percent, of the Number of Properties in Each REIT with Disclosed Square Footage

REIT	SYMB	% Port w/SF
AMERICAN ASSETS TRUST	AAT	79%
AMERICAN CAMPUS COMM	ACC	56%
ASSOCIATED ESTATES	AEC	83%
AIMCO	AIV	90%
ACADIA REALTY TRUST	AKR	36%
ALEXANDRIA REAL ESTATE	ARE	86%
AVALONBAY	AVB	97%
BRANDYWINE REALTY	BDN	94%
STRATEGIC HOTELS	BEE	0%
BIOMED REALTY TRUST	BMR	82%
BRE PROPERTIES	BRE	97%
BOSTON PROPERTIES	BXP	87%
CBL & ASSOCIATES	CBL	34%
CAMPUS CREST COMM	CCG	37%
MACK-CALI REALTY	CLI	93%
COLONIAL PROPERTIES	CLP	96%
CAMDEN PROP TRUST	CPT	95%
COUSINS PROPERTIES	CUZ	71%
DCT INDUSTRIAL TRUST	DCT	83%
DDR CORP	DDR	69%
DOUGLAS EMMETT	DEI	91%
DUKE REALTY	DRE	79%
DIAMONDROCK HOSP	DRH	0%
EDUCATION REALTY TRUST	EDR	50%
EASTGROUP PROPERTIES	EGP	90%
EQUITY RESIDENTIAL	EQR	96%
EQUITY ONE	EQY	78%
ESSEX PROPERTY	ESS	90%

EXTRA SPACE STORAGE	EXR	0%
FELCOR LODGING TRUST	FCH	0%
FIRST INDUSTRIAL REALTY	FR	83%
FEDERAL REALTY	FRT	81%
GENERAL GROWTH	GGP	15%
GLIMCHER REALTY TRUST	GRT	11%
HEALTH CARE REIT	HCN	0%
HCP, INC.	HCP	11%
HIGHWOODS PROPS	HIW	85%
HOME PROPERTIES	HME	96%
HOST HOTELS	HST	0%
KIMCO REALTY	KIM	76%
KILROY REALTY	KRC	92%
LASALLE HOTEL PROP	LHO	0%
LIBERTY PROP TRUST	LRY	84%
MAA	MAA	89%
MACERICH	MAC	22%
MPG OFFICE TRUST	MPG	80%
CORPORATE OFFICE PROP	OFC	88%
PIEDMONT OFFICE REALTY	PDM	97%
PEBBLEBROOK HOTEL	PEB	0%
PENNSYLVANIA REIT	PEI	16%
PROLOGIS	PLD	80%
POST PROPERTIES	PPS	56%
PS BUSINESS PARKS	PSB	91%
REGENCY CENTERS	REG	89%
RLJ LODGING TRUST	RLJ	0%
RETAIL OPP INVTS	ROIC	76%
ROUSE PROPERTIES	RSE	0%
SUNSTONE HOTEL INV	SHO	0%
TANGER FACTORY	SKT	39%
SL GREEN REALTY	SLG	73%
SIMON PROPERTY GROUP	SPG	34%

TAUBMAN CENTERS	TCO	13%
UDR, INC.	UDR	98%
VORNADO	VNO	66%
WASHINGTON REIT	WRE	68%
WEINGARTEN REALTY	WRI	87%

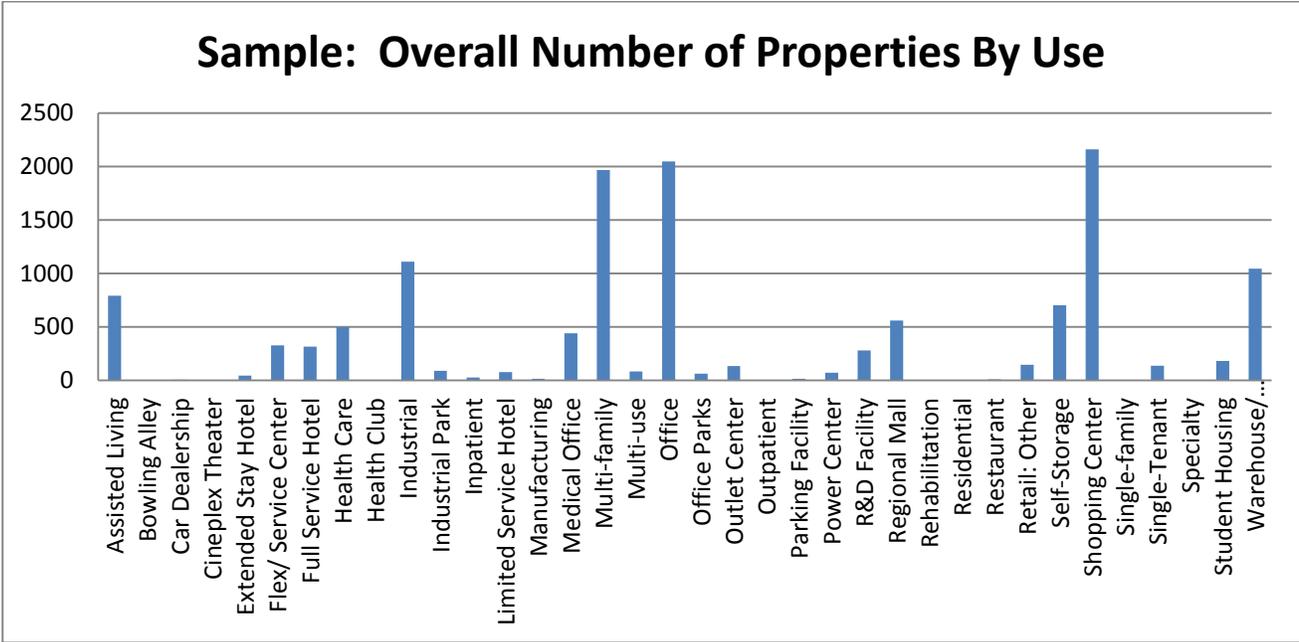
**A.4. Percentage of Properties in Each Portfolio: Consolidated Use, Components of Consolidated Use, Components, No. Sample Properties by Non-Consolidated Use, and No. Sample Eco-Certified Properties by Use**

Percentage of Properties by Consolidated Use												
REIT	Assisted Living	Misc	Health Care	Hotel	Industrial	Residential	Multi-use	Office	Retail	Self-Storage	Single-Tenant	
AAT	0.00	0.00	0.00	4.55	0.00	18.18	0.00	27.27	50.00	0.00	0.00	
ACC	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
AEC	0.00	0.00	0.00	0.00	0.00	97.96	0.00	2.04	0.00	0.00	0.00	
AIV	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
AKR	0.00	1.47	0.00	0.00	0.00	0.00	2.94	4.41	77.94	2.94	10.29	
ARE	0.00	0.00	0.00	0.00	58.21	0.00	0.75	41.04	0.00	0.00	0.00	
AVB	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
BDN	0.00	0.80	0.00	0.40	8.76	0.00	0.80	89.24	0.00	0.00	0.00	
BEE	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
BMR	0.00	3.16	0.00	0.00	72.63	1.05	0.00	23.16	0.00	0.00	0.00	
BRE	0.00	0.00	0.00	0.00	0.00	98.70	0.00	1.30	0.00	0.00	0.00	
BXP	0.00	0.76	0.00	0.76	11.45	1.53	0.76	82.44	1.53	0.00	0.76	
CBL	0.00	0.65	0.00	0.65	0.00	0.65	0.00	11.76	84.97	0.00	1.31	
CCG	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
CLI	0.00	0.73	0.00	0.36	3.28	0.00	0.36	95.26	0.00	0.00	0.00	
CLP	0.00	0.00	0.00	0.00	0.00	92.74	0.81	2.42	4.03	0.00	0.00	
CPT	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	
CUZ	0.00	2.94	0.00	0.00	0.00	2.94	0.00	47.06	47.06	0.00	0.00	
DCT	0.00	0.00	0.00	0.00	99.54	0.00	0.00	0.00	0.46	0.00	0.00	
DDR	0.00	0.48	0.00	0.00	0.00	0.00	0.24	0.00	91.39	0.00	7.89	
DEI	0.00	0.00	0.00	0.00	0.00	13.43	4.48	82.09	0.00	0.00	0.00	
DRE	0.00	0.41	0.28	0.00	66.71	0.00	0.00	31.64	0.96	0.00	0.00	

DRH	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EDR	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
EGP	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EQR	0.00	0.00	0.00	0.00	0.00	99.52	0.24	0.24	0.00	0.00	0.00	0.00
EQY	0.00	0.59	0.00	0.00	0.59	0.59	0.00	2.94	92.94	0.00	0.00	2.35
ESS	0.00	0.64	0.00	0.00	0.00	97.44	0.00	1.28	0.64	0.00	0.00	0.00
EXR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00
FCH	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FR	0.00	0.00	0.00	0.00	99.70	0.00	0.00	0.30	0.00	0.00	0.00	0.00
FRT	0.00	0.00	0.00	0.00	0.00	2.06	9.28	0.00	87.63	0.00	0.00	1.03
GGP	0.00	0.00	0.00	0.00	0.00	0.00	0.70	4.90	94.41	0.00	0.00	0.00
GRT	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	96.30	0.00	0.00	0.00
HCN	60.24	0.00	21.16	0.00	0.22	0.00	0.00	18.37	0.00	0.00	0.00	0.00
HCP	28.04	0.00	37.50	0.00	12.61	0.00	0.00	21.85	0.00	0.00	0.00	0.00
HIW	0.00	0.64	0.00	0.00	18.97	0.00	0.96	79.42	0.00	0.00	0.00	0.00
HME	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
HST	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KIM	0.00	1.67	0.13	0.13	0.00	0.00	0.77	0.90	87.52	0.00	0.00	8.88
KRC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00
LHO	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LRY	0.00	0.00	0.00	0.00	59.43	0.15	0.00	40.42	0.00	0.00	0.00	0.00
MAA	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
MAC	0.00	0.00	0.00	0.00	0.00	0.00	2.44	4.88	92.68	0.00	0.00	0.00
MPG	0.00	20.00	0.00	0.00	0.00	0.00	0.00	80.00	0.00	0.00	0.00	0.00
OFC	0.00	0.44	0.00	0.00	0.89	0.00	0.00	98.67	0.00	0.00	0.00	0.00
PDM	0.00	0.00	0.00	0.00	2.56	0.00	0.00	97.44	0.00	0.00	0.00	0.00
PEB	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PEI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.27	97.73	0.00	0.00	0.00

PLD	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PPS	0.00	0.00	0.00	0.00	0.00	56.67	43.33	0.00	0.00	0.00	0.00	0.00
PSB	0.00	0.00	0.00	0.00	39.62	0.00	4.72	55.66	0.00	0.00	0.00	0.00
REG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	98.52	0.00	0.00	1.48
RLJ	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROIC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
RSE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
SHO	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SKT	0.00	0.00	0.00	0.00	2.44	0.00	0.00	0.00	97.56	0.00	0.00	0.00
SLG	0.00	0.00	0.00	0.00	0.00	2.44	4.88	76.83	14.63	0.00	0.00	1.22
SPG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
TCO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00
UDR	0.00	0.00	0.00	0.00	0.00	97.42	0.52	0.52	1.55	0.00	0.00	0.00
VNO	0.00	0.00	0.00	0.86	0.86	1.72	4.29	25.32	65.24	0.00	0.00	1.72
WRE	0.00	0.00	0.00	0.00	0.00	16.18	0.00	60.29	23.53	0.00	0.00	0.00
WRI	0.00	0.00	0.00	0.00	1.01	0.00	0.00	1.01	95.30	0.00	0.00	2.68

Consolidated Use										
Assisted Living	Misc	Health Care	Hotel	Industrial	Residential	Multi-use	Office	Retail	Self-Storage	Single-Tenant
Assisted Living	Bowling Alley	Health Care	Extended Stay Hotel	Industrial	Multi-family	Multi-use	Medical Office	Outlet Center	Self-Storage	Single-Tenant
	Car Dealership	Inpatient	Full Service Hotel	Industrial Park	Residential		Office	Power Center		
	Cineplex Theater	Outpatient	Hotel	Manufacturing	Single-family		Office Parks	Regional Mall		
	Health Club	Rehabilitation	Limited Service Hotel	R&D Facility	Student Housing			Retail: Other		
	Parking Facility			Flex/Service Center				Shopping Center		
	Restaurant			Warehouse/ Distribution Center						
	Specialty									



## A.5. LEED and Energy Star Regulations by State/City/County, Type, Year Implemented, and Requirement

State	City/County	Type	Year Implemented	Requirement
CA	San Francisco	LEED	2008	Large Commercial: New permit applications must include documentation to achieve LEED Silver certification
CA	San Francisco	LEED	2009	Mid-Sized Commercial: New permit applications don't need to meet LEED certification requirements but must meet LEED standards for building commissioning, landscaping, water use, and construction debris management.
CA	San Francisco	LEED	2012	Mid-Sized Commercial: Building applications must also meet LEED standards for the use of on-site renewable energy or the purchase of renewable energy credits
CA	San Francisco	LEED	2012	Large Commercial: New permit applications must include documentation to achieve LEED Gold certification
CA	San Jose	LEED		Tier 1 Commercial Projects include commercial industrial projects (non-residential) of less than 25,000 square feet, and less than a height of 75 feet are required to submit a completed GreenPoint Rated Checklist or LEED Checklist in order to receive a building permit.
CA	San Jose	LEED		Tier 2 Commercial Projects include commercial industrial buildings (non-residential) of more than 25,000 square feet but less than 75 feet in height must LEED Silver certified. Mix-Use Projects must submit a GreenPoint Rated Checklist or LEED Checklist and receive the minimum LEED certification required by the relevant standard in the Ordinance.
CA	San Jose	LEED		Mix-Use Projects must submit a GreenPoint Rated Checklist or LEED Checklist and receive the minimum LEED certification required by the relevant standard in the Ordinance.
CA	Los Angeles County	LEED	2010	10,000-24,999 sq. ft.; Permit filed after 1/1/2010: Must be LEED certified or equivalent
CA	Los Angeles County	LEED	2010	25,000 sq. ft. or more; Permit filed after 1/1/2010: Must be LEED silver certified or equivalent
CA	Los Angeles County	LEED	2010	High-Rise Building; Permit filed after 1/1/2010: Must be LEED silver certified or equivalent
CA	Marin County	LEED		Commercial New Construction: New construction, including additions to existing buildings, between 2,000 and 4,999 square feet must comply with the prerequisite requirements of LEED New Construction or LEED Core and Shell.
CA	Marin County	LEED		Commercial New Construction: Building projects between 5,000 and 49,999 square feet must be certified at the Silver level of LEED New Construction or LEED Core and Shell and be 15% more efficient than the state building code.
CA	Marin County	LEED		Commercial New Construction: Building projects greater than 50,000 square feet must be certified at the Gold level of LEED New Construction or LEED Core and Shell and be 15% more efficient than the state building code.
CA	Marin County	LEED		Commercial Remodels: Commercial remodelling projects which cost less than \$500,000 or involve less than 5,000 square feet have voluntary energy suggestions, which are not required. Larger projects have requirements which are based on LEED Commercial Interiors or LEED Operations and Maintenance.
CT		LEED	2009	Not including residential buildings with less than four units, the provision applies to buildings constructed after January 1, 2009, that are projected to cost at least \$5 million, and building renovation projects started after January 1, 2010, that are projected to cost at least \$2 million and requires the building projects which meet this criteria to achieve the requirements equivalent to a silver rating from LEED, a two-globe rating in the Green Globes USA design program, or an equivalent standard.

DC	DC	ES	2009-2014	In addition to DC's building codes, DC passed the Clean and Affordable Energy Act of 2008 (B17-492) that establishes energy benchmarking requirements for government and private buildings. Starting in the fall of 2009, government buildings must be benchmarked using the Energy Star® Portfolio Manager tool. Annual benchmarking for private buildings will be phased in over four years, starting on January 1, 2010.
TX	Austin	LEED		The City of Austin has numerous green building provisions within the city building code, with requirements that vary according to location, zoning designation and building type and relies on the Austin Energy Green Building Rating system and the LEED certification system as metrics. In some cases developers have the option of achieving compliance under either of the two systems.
TX	Dallas	LEED	2009	Buildings that are larger than 50,000 square feet must submit a LEED scorecard demonstrating that they have incorporated a number of LEED credits. The type of project determines the number of points that must be obtained. LEED New Construction (NC) projects must have 22 points LEED Core and Shell projects must have 20 points LEED for Retail must have 22 points LEED for Healthcare must have 25 points Multifamily development may use LEED NC, LEED for Homes, Green Built Texas, or an equivalent green building standard.

Source: DSIRE

## No. Sample Properties in LEED and Energy Star Regulatory Areas

Potential Properties in LEED and Energy Star Regulatory Areas (2011)		
City/State	# Properties	% Total Sample
San Francisco, CA	121	0.91%
San Jose, CA	48	0.36%
Connecticut	132	0.99%
Washington DC	107	0.80%
Austin, TX	95	0.71%
Dallas, TX	83	0.62%
Los Angeles County, CA	198	1.49%
Marin County, CA	11	0.08%
<b>TOTAL</b>	<b>795</b>	<b>5.96%</b>

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