

# Does Green Pay Off?

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## Preface

With all the talk of green these days, it is easy to feel like we will soon all be mandated to maintain compost piles in our backyards and hug a tree daily or become outcasts. It is like America suddenly woke up to the fact that our resources are finite and our demands infinite. Chalk this up to some good leadership by the USGBC (U.S. Green Building Council) as well as inspirational books and talks by experts like Bill McDonough of “Cradle to Cradle” fame.<sup>2</sup> Appendix 1 to this paper includes some definitions to help novices can sort out the various political forces and perspectives coming to bear on this tsunami of new environmental and efficiency concerns.

## Introduction

Here we reveal the first systematic study, as opposed to case studies, that addresses questions on the benefits of investments in energy savings and environmental design. We compare Energy Star office buildings, many of which are LEED certified, with non-Energy Star rated buildings. Essentially, Energy Star buildings are those within the 25% most efficient buildings for energy conservation. To date, most studies on the benefits of green investment are case studies, which are difficult to generalize from. Most surveys on the costs are from the USGBC and as such some developers are skeptical of the bias. We have no reason to be biased here in presenting our initial findings, laying out research questions to be addressed and providing some insights on the leaders in this arena.

We note up front that many of the benefits of green and high performance buildings may not yet show up in higher base rents. The reason is simple. Most of the benefits accrue to tenants and tenants require proof before they are willing to share in the cost of investments that only theoretically will help them be more productive or save money. Only in very recent years have tenants started to fully appreciate the benefits of cleaner air, more natural lighting and easier to modify spaces. A study by Greg Kats of Capital E Analytics in early 2007 provided the following summary of benefits from going green, as shown in Exhibit A-1 of Appendix 2. Productivity benefits are estimated to be as much as 10 times the energy savings from green efforts. These benefits come in the form of lower absenteeism, fewer headaches at work, greater retail sales and easier re-configuration of space resulting in less downtime and lower costs. Cost estimates based on a sample of 33 office and school buildings suggested only .6% greater costs for LEED certification, 1.9% for silver, 2.2% for gold, and 6.8% for platinum certification. Here we focus on the more direct real estate benefits.

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<sup>2</sup> See [http://www.mcdonough.com/cradle\\_to\\_cradle.htm](http://www.mcdonough.com/cradle_to_cradle.htm). *Cradle to Cradle* by William McDonough and Michael Braungart, North Point Press, 2002.

## Data

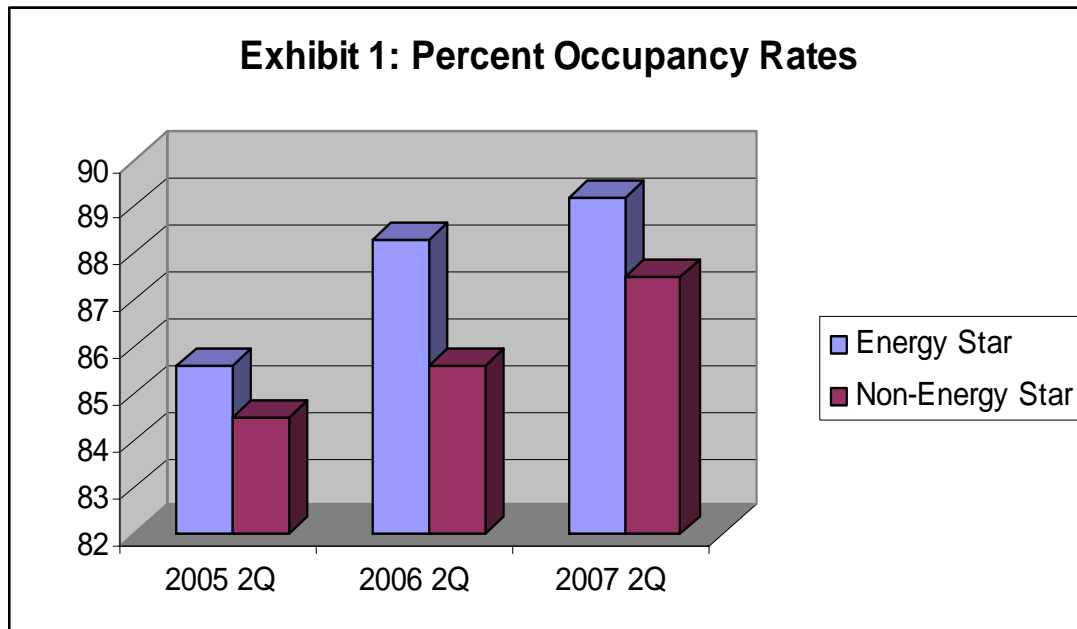
CoStar is the leading collector of property data. A few years ago, CoStar started to note whether buildings were Energy Star-rated or LEED-certified. As of early 2007, there were 550 Energy Star-rated buildings in the database and 318 LEED-certified buildings. The Energy Star-rated buildings included 163,120,856 square feet with the bulk (440) being office buildings. The typical Energy Star office building is Class A with 353,000 square feet, 15 floors, built in 1985, multi-tenanted, and 91.7% leased. The following filters were used to develop the comparison sample studied here:

- ✓ Only Class A office buildings
- ✓ 200,000 square feet or more
- ✓ 5 stories or more
- ✓ Built since 1970
- ✓ Multi-tenanted

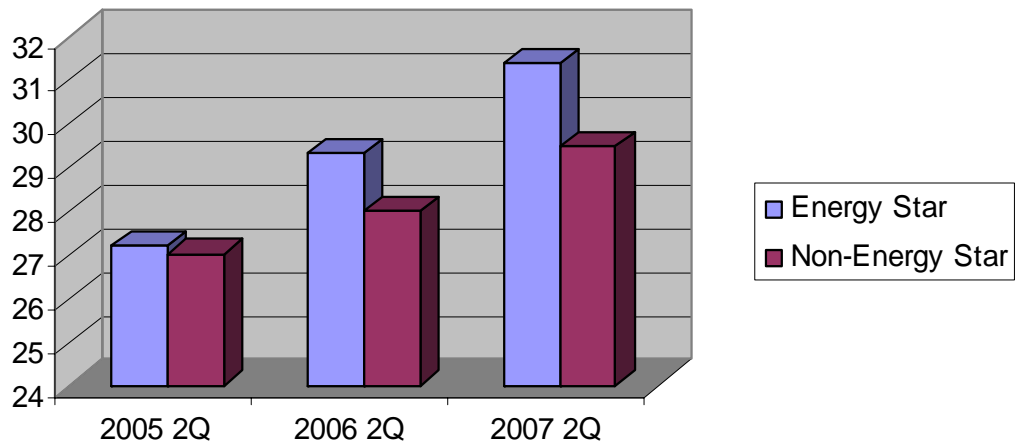
51% of the Energy Star buildings met these criteria which resulted in a sample of 223 buildings with 111.7 million square feet. The non-Energy Star buildings meeting these criteria numbered 2,077 with 889.1 million square feet.

## Results

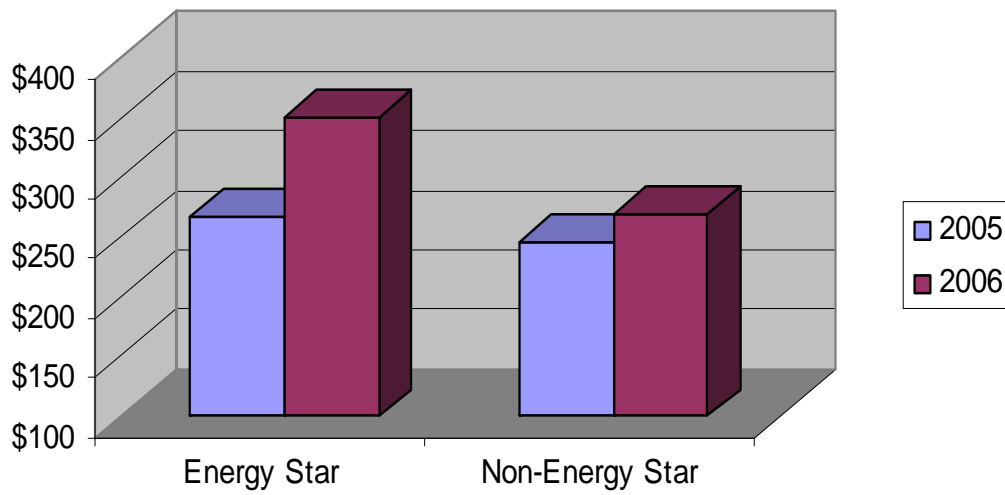
Results are provided in four Exhibits as follows:

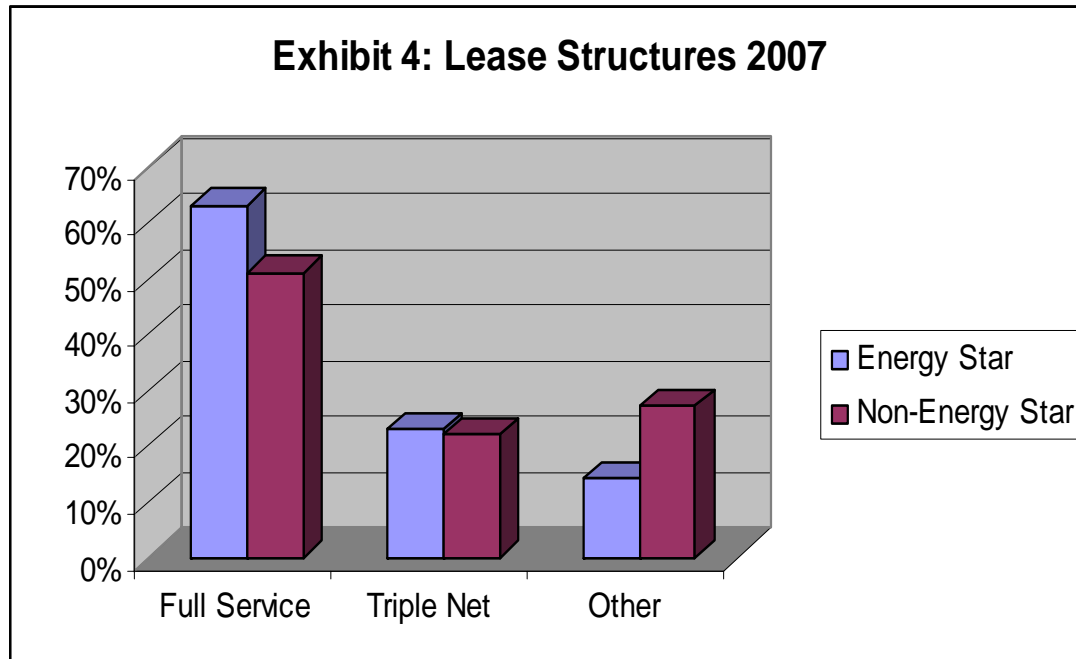


**Exhibit 2: Rental Rates**



**Exhibit 3: Sales Price Per Sq Ft**



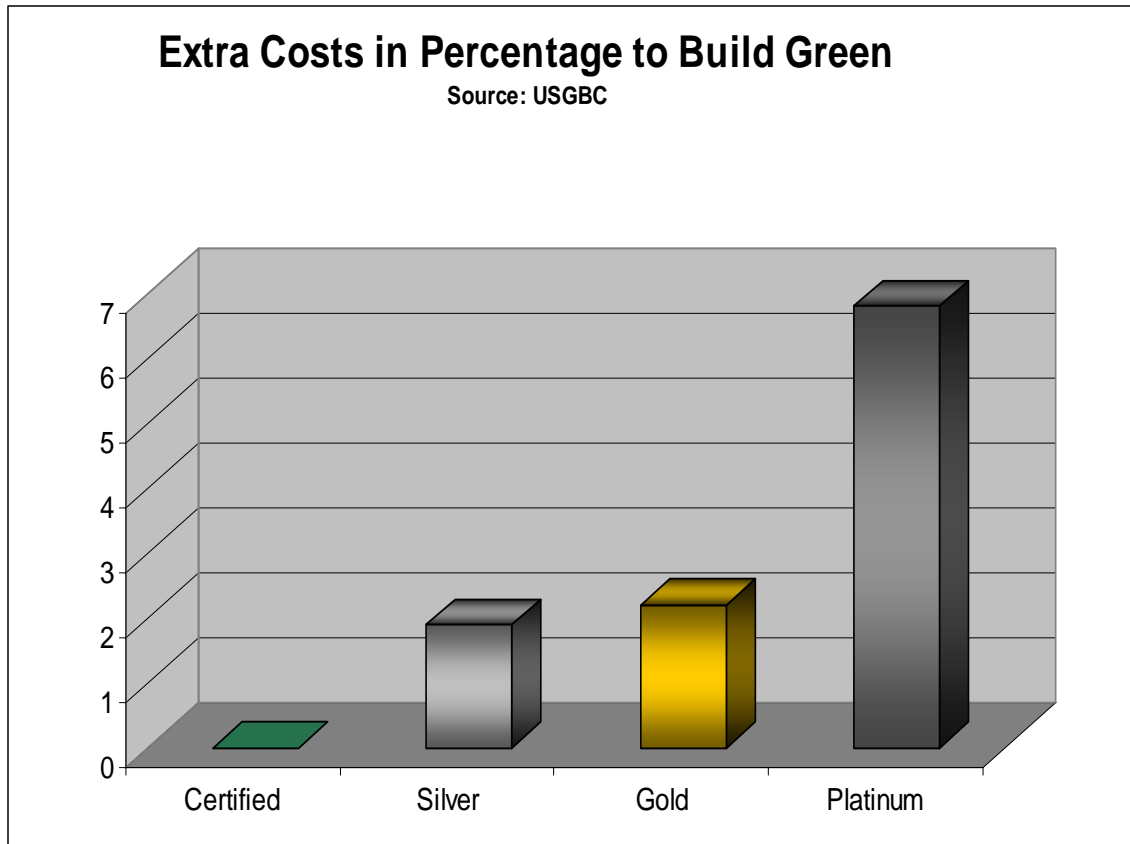


Operating expenses from energy costs also varied with Energy Star-rated buildings running \$1.27 per square foot per year for energy in 2006 and non-Energy Star-rated buildings running \$1.81 per square foot. Together, the higher occupancy rates, higher rents and lower operating expenses translate to significantly higher values. Our results show higher sales prices by 30% more per square foot, although the short history of data suggests that this alone is not definitive but certainly very encouraging for investing in energy savings.

#### **Extra Costs to Go Green**

We do not have a large sample of cost data on achieving Energy Star ratings nor do we have neutrally supplied data on LEED certification but we do have data as supplied by the USGBC (Exhibits 5 and 6) and anecdotal surveys. While Energy Star rating may not equal LEED certification, we suggest that silver certification is a reasonable proxy for the extra costs, at least until more data can be derived. According to surveys of those meeting LEED certification, the average costs are reported to be about 3% extra vs. the zero figure provided by the USGBC. With silver at 2.5% extra, plus the 3%, we are still only at 5.5%. In fact, if we doubled the Platinum certification cost estimate from the USGBC, we are still at half of the extra value from Energy Star rating observed here.

**Exhibit 5: Extra Costs to Become LEED Certified as of 2007**



**Exhibit 6: Extra Costs to Go Green Vary By Region**

| Market               | Platinum | Gold  | Silver |
|----------------------|----------|-------|--------|
| <b>UCSB Ave.</b>     | 7.8 %    | 2.7 % | 1.0 %  |
| <b>San Francisco</b> | 7.8 %    | 2.7 % | 1.0 %  |
| <b>Merced</b>        | 10.3 %   | 5.3 % | 3.7 %  |
| <b>Denver</b>        | 7.6 %    | 2.8 % | 1.2 %  |
| <b>Boston</b>        | 8.8 %    | 4.2 % | 2.6 %  |
| <b>Houston</b>       | 9.1 %    | 6.3 % | 1.7 %  |

Again, while LEED certification does not equate Energy Star ratings, there is a correlation and over time it will become more difficult to make the Energy Star rating since the rating is relative, not absolute. Yet, we have clearly observed that minor efforts are required to hit LEED certification at the minimum level, and Silver or Gold ratings are more likely to be needed to

achieve really efficient buildings, which may also be high performance adaptable buildings. This strategic perspective for achieving LEED certification is further explored below.

### Green Point Strategies

Talk to several developers successful at securing LEED certification and they will tell you that with a little planning it is neither that hard nor costly to hit the minimum point total for certification, which is 26 out of 60 possible points. Many points are easy such as designating minimal parking for low emission vehicles and facilitating bike racks. Others, such as teaching construction workers to toss waste into three different bins, are harder but feasible. Within the following categories, we see that some points are relatively low cost or costless with a little planning and education:

|                                      | Points Possible | Easy Points  |
|--------------------------------------|-----------------|--------------|
| <b>Sustainable Sites:</b>            | 14              | 6-7          |
| <b>Water Efficiency:</b>             | 5               | 4-5          |
| <b>Energy &amp; Atmosphere:</b>      | 17              | 0-1          |
| <b>Materials &amp; Resources:</b>    | 13              | 6-8          |
| <b>Indoor Environmental Quality:</b> | 15              | 5-7          |
| <b>Innovation and Design:</b>        | 5               | 1-2          |
| <b>Total:</b>                        | 69              | <b>22-30</b> |

From Trevor Jensen, USD Master of Science in Real Estate Student Working Paper on LEED Strategies.

### Where and who are the leaders in green development, ownership and occupancy?

**Exhibit 7: Leading Metro Areas for Green as of Second Quarter 2007**

|    | Metro Area          | # Bldgs | Square Feet | % of Total |
|----|---------------------|---------|-------------|------------|
| 1  | Los Angeles         | 100     | 26,167,038  | 13.3%      |
| 2  | Houston             | 46      | 21,101,378  | 10.8%      |
| 3  | Washington DC       | 61      | 19,796,646  | 10.1%      |
| 4  | New York City       | 11      | 12,328,784  | 6.3%       |
| 5  | San Francisco       | 30      | 11,862,367  | 6.0%       |
| 6  | Minneapolis/St Paul | 20      | 11,381,738  | 5.8%       |
| 7  | Denver              | 34      | 10,285,745  | 5.2%       |
| 8  | Seattle/Puget Sound | 16      | 7,616,710   | 3.9%       |
| 9  | Chicago             | 13      | 6,326,489   | 3.2%       |
| 10 | Dallas/Ft Worth     | 20      | 6,058,892   | 3.1%       |

**Exhibit 8: Leading States for Green as of Second Quarter 2007**

|    | State      | # Bldgs | Square Feet | % of Total |
|----|------------|---------|-------------|------------|
| 1  | California | 219     | 51,952,382  | 26.5%      |
| 2  | Texas      | 91      | 27,942,442  | 14.2%      |
| 3  | New York   | 13      | 12,580,084  | 6.4%       |
| 4  | Minnesota  | 20      | 11,381,738  | 5.8%       |
| 5  | Colorado   | 39      | 11,244,380  | 5.7%       |
| 6  | Virginia   | 27      | 8,468,423   | 4.3%       |
| 7  | Wash. DC   | 24      | 7,803,610   | 4.0%       |
| 8  | Washington | 17      | 7,649,214   | 3.9%       |
| 9  | Florida    | 28      | 7,209,186   | 3.7%       |
| 10 | Illinois   | 13      | 6,326,489   | 3.2%       |

**Exhibit 9: Leading Owners for Green Office Buildings as of Second Quarter 2007**

|    | Owner                              | # Bldgs | Square Feet | % of Total |
|----|------------------------------------|---------|-------------|------------|
| 1  | Hines                              | 22      | 12,878,213  | 8.5%       |
| 2  | TIAA-CREF                          | 17      | 5,719,217   | 3.8%       |
| 3  | Vornado/Charles E. Smith Comm. Rea | 12      | 4,207,716   | 2.8%       |
| 4  | Silverstein Properties Inc.        | 2       | 3,680,076   | 2.4%       |
| 5  | Beacon Capital Partners, Inc.      | 5       | 3,603,736   | 2.4%       |
| 6  | The Blackstone Group               | 8       | 3,566,612   | 2.4%       |
| 7  | Manulife Financial                 | 7       | 3,509,420   | 2.3%       |
| 8  | The Durst Organization             | 4       | 3,278,267   | 2.2%       |
| 9  | GE Capital                         | 15      | 3,093,947   | 2.0%       |
| 10 | Maguire Properties                 | 4       | 3,046,648   | 2.0%       |

**Exhibit 10: Leading Developers of Green Office Buildings as of Second Quarter 2007**

|    | Developer                                | # Bldgs | Square Feet | % of Total |
|----|--|---------|-------------|------------|
| 1  | Hines                                    | 39      | 26,374,642  | 17.7%      |
| 2  | Vornado/ Charles E. Smith Commercial Rea | 14      | 4,750,018   | 3.2%       |
| 3  | The Durst Organization                   | 3       | 2,703,267   | 1.8%       |
| 4  | Shorenstein Company, LLC                 | 3       | 2,444,010   | 1.6%       |
| 5  | Opus Northwest Corporation LLC           | 4       | 2,346,632   | 1.6%       |
| 6  | John Hancock Real Estate Finance Group   | 2       | 2,171,881   | 1.5%       |
| 7  | The Durst Organization/Bank of America   | 1       | 2,118,441   | 1.4%       |
| 8  | Trammell Crow Company                    | 7       | 2,092,713   | 1.4%       |
| 9  | Texas Eastern Corporation                | 2       | 2,086,307   | 1.4%       |
| 10 | Maguire Properties                       | 3       | 2,019,629   | 1.4%       |

**Exhibit 11: Leading Types of Tenants by Industry in Energy Star Office Buildings as of Second Quarter 2007**

|    | Tenant Type               | # Tenants    | Square Feet        | % of Total    |
|----|---------------------------|--------------|--------------------|---------------|
| 1  | Financial Institutions    | 968          | 20,228,058         | 18.0%         |
| 2  | Law Firms                 | 822          | 18,407,157         | 16.4%         |
| 3  | Retailers/Wholesalers     | 694          | 12,275,254         | 10.9%         |
| 4  | Manufacturing             | 240          | 9,704,599          | 8.6%          |
| 5  | Personal Services         | 588          | 7,969,667          | 7.1%          |
| 6  | Insurance                 | 305          | 7,012,850          | 6.2%          |
| 7  | Agri/Mining/Utilities     | 205          | 6,271,296          | 5.6%          |
| 8  | Business Services         | 560          | 5,478,659          | 4.9%          |
| 9  | Computers/Data Processing | 245          | 5,218,630          | 4.6%          |
| 10 | Government                | 127          | 5,161,872          | 4.6%          |
| 11 | Accountants               | 196          | 4,003,835          | 3.6%          |
| 12 | Engineers/Architects      | 148          | 3,876,718          | 3.4%          |
| 13 | Real Estate               | 367          | 2,215,196          | 2.0%          |
| 14 | Communications            | 98           | 1,603,219          | 1.4%          |
| 15 | Medical                   | 178          | 1,516,067          | 1.3%          |
| 16 | Transportation            | 70           | 1,465,971          | 1.3%          |
|    | <b>Grand Total</b>        | <b>5,811</b> | <b>112,409,048</b> | <b>100.0%</b> |

## Conclusions

Contrary to popular opinion, the green movement is not purely public sector-driven. Tenants like the EPA and others within the Federal government are important drivers but so is the typical public corporation today. The more typical tenants asking for energy star ratings, LEED certification or high performance building features are private market-based firms. Private developers are leading the way in accommodating this burgeoning demand. Some investors like CALPERS have recently announced efforts to increase their emphasis on green over the next several years. Some cities, like Boston or San Francisco, have mandated LEED certification, while others, like Toronto, have provided incentives for energy conservation methods. We need more studies on the best practices and this paper is intended in part as a call for more research.

The real barriers to go green are mostly a lack of planning and education. Included in this are those who only work to improve business practices when competition forces them to do so—the “Who Moved My Cheese?” mentality.<sup>3</sup> Culture plays a role as well and we observe far more environmental leadership in Europe and even Asia. Inexperience plays a role and just learning where to find the resources to “go green” are a significant hurdle for many newly curious developers. Yet, anyone who has been through the process of going green becomes a convert and no longer sees it as difficult. There are cynics about the benefits relative to costs but even Louis Pasteur<sup>4</sup> had to prove repeatedly that immunization was possible against viruses while the prevailing medical community resisted all progress until overwhelming evidence was provided.

There are real economic barriers to progress. When property managers are paid extra administrative fees on passed through common area utility costs, they have fewer incentives to want to encourage energy savings. Also problematic are typical expense-pass-through net leases that do not balance out the increased rent necessary to support higher initial building and design costs with the gains that will supposedly accrue but cannot be guaranteed. Benefits from more flexible and adaptable buildings are finally starting to become known as well as energy savings. We are starting to find less skeptical tenants willing to believe claims of potential benefits. Still, many public companies are starting to initiate and support resource and energy conservation policies, and if they are serious, they should be willing to seek out more environmentally friendly buildings. Perhaps we are now witnessing the evidence of such trends and those buildings that do not reflect more efficient operating abilities will become obsolete much faster.

What is really needed is market transparency and better information along with measurement standards that can be agreed upon domestically if not globally. LEED is a good start, but we need more specific ratings on energy consumption similar to what is used on refrigerators, washing machines and even for cars with respect to fuel consumption. After such ratings become known, they affect behaviors and values with more certainty. We need such a rating system for energy consumption along with systems that provide information on building

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<sup>3</sup> “Who Moved My Cheese?” is the story by Spencer Johnson, 1998 Putnam Pub, where personalities of self-satisfied mice were compared to those who wanted to manage risk and do research while ample food supplies existed.

<sup>4</sup> Louis Pasteur 1822-95 French chemist who developed the germ theory and learned how to mitigate bacteria and viruses including the first rabies vaccine and vaccines against anthrax.



adaptability and resource impact. Some day we may see large property owners with green self-sustaining solar-powered mixed use developments selling off carbon credits to others.

## References

Kats, Greg “The Costs and Benefits of Green” Capital E Analytics, 2007, ppt.

Kohlhepp, Dan, “The Greening of One Potomac Yard” 2006, ppt file. Crescent Resources LLC. Crescent Resources is the Master Developer of Potomac Yard, a 300 acre redevelopment of the former Richmond Fredericksburg and Potomac rail yard in Arlington and Alexandria, VA. This project includes 4.5 million square feet of office space, 3000 residential units and 200,000 square feet of retail space, 1250 hotel rooms and 92.4 acres of open or park space.

Longdon, David “Costs of Green Revisited” July 2007 monograph. See <http://www.davislangdon.com/USA/>

Scheer, Roddy and Randy Woods “Is There Green in Going Green?” SBM, April 2007.

“Green Review” by Building Design and Construction, November 2006 white paper.

## Appendix 1: Defining Green, Sustainable, Intelligent and Secure Buildings

**CABA:** Continental Automated Buildings Association, based in Ottawa, Canada. CABA is a not-for-profit industry association that promotes advanced technologies for the automation of homes and buildings in North America. CABA encourages the development, promotion, pursuit and understanding of integrated systems and automation in homes and buildings.

**Green:** A term applied to practically everything in which energy savings and resources are conserved or re-used. More specifically, it is related to the LEED rating provided by the U.S. Green Building Council (USGBC) or the “Energy Star” rating provided by the U.S. Environmental Protection Agency (EPA).

**Energy Star:** In 1992, the U.S. Environmental Protection Agency (EPA) introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. A few years ago, the EPA extended the label to cover new homes and commercial and industrial buildings. Those rated as among the most 25% energy efficient are given the Energy Star rating. Over time, this rating should become more difficult to achieve since it is a relative score as opposed to an absolute score like the LEED ratings.

**LEED:** LEED is a product of the U.S. Green Building Council. It stands for Leadership in Energy and Environmental Design and applies to the design, building materials used and operation of the building. Points are awarded for sustainability, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality and design innovation. It is intended as a hurdle that only 25% of existing buildings will pass at the certified level with little additional cost. Higher point scores can result in Silver, Gold and Platinum ratings. Over time, LEED point systems will be revised. Categories that can achieve ratings include new construction, existing buildings, commercial interiors, core and shell, homes or even neighborhood developments.

**Sustainable:** A system that on a “net” basis does not deplete resources. With respect to sustainable development, the focus includes all those elements common to green buildings, as well as sites that are sustainable with indigenous plantscaping, capturing “gray” water that has been used and rainwater, and designed to minimize transport costs. Mixed-use developments where people can work, live, go to school and play are a natural extension of sustainable development. Two good examples are Stapleton, Colo. (See <http://www.stapletondenver.com/>) and Birkdale Village, in north Charlotte, N.C. (See <http://www.birkdalevillage.net/welcome.htm>)

**Intelligent:** The term for an adaptable building that is likely green and also easy to retrofit or remodel for changing internal configurations and uses (also known as a **High Performance Building**). Such buildings have longer economic lives and cost much less to occupy. Typical elements of an intelligent building are modular floor units, removable walls, under floor venting and wiring for phones and data, motion sensor cameras and much more all on whips that are easy to re-configure. Back-up systems may include several sources of power and generators with battery back-ups and safe air/water storage systems. An example of an intelligent building would be ABN AMRO in Chicago (See <http://www.hines.com/property/detail.aspx?id=156>)

or <http://www.buildings.com/articles/detail.aspx?contentID=2128>. See also <http://www.intelligentbuildingstoday.com/> and <http://www.caba.org/index.html>.)

**Secure Buildings:** After Sept. 11, 2001, a number of new security measures came to be in many buildings. Some of these features include access control for visitors and maintenance staff. Other features include surveillance, back-up power, air, water and emergency plans. Secure buildings have several redundant systems. Secure buildings may be intelligent, but are not always green.

**USGBC:** The U.S. Green Building Council (USGBC) is a non-profit composed of leaders from every sector of the building industry working to promote buildings that are environmentally responsible, profitable and healthy places to live and work. More than 11,000 member organizations and 75 regional chapters are united to advance the mission of transforming the building industry to sustainability. (See <http://www.usgbc.org/>)

## Appendix 2

### Exhibit A-1: The Financial Benefits of Going Green are Mostly Related to Productivity

## Financial Benefits of Green Buildings Summary of Findings (per ft<sup>2</sup>)

| Category                             | 20-year Net Present Value |
|--------------------------------------|---------------------------|
| Energy Savings                       | \$5.80                    |
| Emissions Savings                    | \$1.20                    |
| Water Savings                        | \$0.50                    |
| Operations and Maintenance Savings   | \$8.50                    |
| Productivity and Health Value        | \$36.90 to \$55.30        |
| <b>Subtotal</b>                      | <b>\$52.90 to \$71.30</b> |
| Average Extra Cost of Building Green | (-3.00 to -\$5.00)        |
| <b>Total 20-year Net Benefit</b>     | <b>\$50 to \$65</b>       |

*Source: Capital E Analysis*