

# GREEN BUILDING ASSET VALUATION: TRENDS AND DATA

## DO GREEN BUILDINGS TRANSLATE TO HIGHER ASSET VALUE?

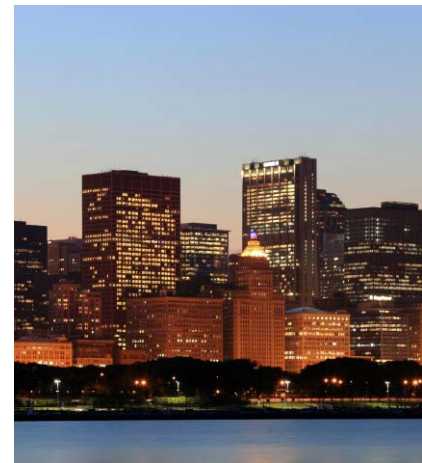
Energy efficient green buildings have lower energy bills and building designs that improve the occupants' experience and worker productivity. Logically, all this should translate into greater building value, as owners and tenants anticipate in survey after survey. But do they in practice?

Owners and tenants alike recognize that monthly operating costs should be significantly lower in green buildings, since energy is the highest operating cost in most offices today, and the net present value of future energy savings can be added to the resale value. However, some of the co-benefits of an energy efficient space, such as daylighting that improves the customer and employee experience and worker productivity, may be somewhat harder to quantify.

Studies increasingly show that all of this logic is prevailing in the market. Existing analyses of data demonstrate that green buildings have:

- Increased resale value
- Increased rental rates
- Higher occupancy rates
- Lower operating expenses
- Higher net operating income
- Lower capitalization rates
- Productivity gains

Most available data does show increased value for ENERGY STAR or LEED buildings in the United States compared to standard buildings in the U.S. market. ENERGY STAR numbers are more representative of the entire existing building market because many of the research studies were completed before the recent significant growth in the LEED Existing Buildings certification. LEED data does provide a snapshot of relatively newer buildings compared to the U.S. building stock as a whole (most of the LEED stock was built in the last 10 years).



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With 1.5 billion square feet of LEED-certified space and 2.5 billion square feet of ENERGY STAR-certified commercial space in the market today, there is an ever more robust set of data for analysis to demonstrate statistically significant financial benefits of energy efficient buildings. A large data set is needed because an energy efficient green building can only be compared to its peer conventional building – a building of similar age, height, size, and sub-market location.

U.S. studies find:

1. **Increased rental rates: 2-17%**

- ENERGY STAR properties had a rental premium of 4.8%, or \$1.26 per square foot. (Pivo 2008)
- ENERGY STAR offices had a rental premium of 3% between 2004-2007. (Eichholtz 2009)
- ENERGY STAR or LEED office buildings had a rental premium of 2% between 2007-2009. (Eichholtz 2010)
- ENERGY STAR and LEED certified office space had a rental premium of 6%. (Fuerst 2009)
- Rental premium of 7-9% for ENERGY STAR buildings and a rental premium of 7-9% LEED buildings 15-17%. (Wiley 2010)

2. **Improved resale value: 5.8-35%**

- ENERGY STAR properties had a 13.5% higher market value relative to non-ENERGY STAR properties. (Pivo 2008)
- Building sale price increases by 10% with LEED certification and 5.8% with ENERGY STAR certification in an analysis of building sales from 2003-2007. (Miller 2008)
- A sale price premium of 19% was found for ENERGY STAR offices between 2004 and 2007. (Eichholtz 2009)
- A sale price premium of 13% was found for ENERGY STAR and LEED office buildings between 2007 and 2009. (Eichholtz 2010)
- A sale price premium of 31% was reported for ENERGY STAR and 35% for LEED-certified offices. (Fuerst 2009)
- A sale price premium of \$130 per square foot LEED and \$30 per square foot for ENERGY STAR was found in 25 metropolitan markets. (Wiley 2010)

3. **Higher occupancy rates: 2-18%**

- ENERGY STAR properties had 0.9% higher occupancy rates. (Pivo 2008)
- Occupancy rates were 2-4% higher for ENERGY STAR buildings compared non-ENERGY STAR buildings. (Miller 2008)
- Effective rent (rent adjusted for different vacancy rates in labeled offices) was about 10% higher in ENERGY STAR offices and 9% higher for LEED offices, compared to offices of the same age and building quality, within a 0.2-square-mile area around a certified building. (Eichholtz 2009)  
Effective rent was 5% higher for ENERGY STAR and LEED office buildings between 2007-2009. (Eichholtz 2010)
- Occupancy rates were 16-18% higher for LEED certified buildings and 10-11% higher for ENERGY STAR certified buildings. (Wiley 2010)

#### 4. **Lower operating expenses: 30%**

- Operating expense were 30% lower for ENERGY STAR compared non-ENERGY STAR buildings. (Miller 2008)
- ENERGY STAR buildings had 9.8% lower utility expenditures than non-ENERGY STAR buildings. (Pivo 2008)

#### 5. **Higher net operating income (from higher rents, higher occupancy rates, or lower operating expenses): 5.9%**

- Energy cost represents about 30 percent of operating expenses in a typical U.S. office building (Fuerst 2009). Increasing net operating income means lower operational expenses to the building owner and higher asset value at the time of sale.
- For ENERGY STAR properties, net operating income per square foot was 25 cents (5.9%) higher than for non-ENERGY STAR properties. (Pivo 2008)

#### 6. **Lower capitalization rate: 40-55 basis points**

- ENERGY STAR properties had capitalization rates 50 basis points lower than non-ENERGY STAR properties. (Pivo 2008)
- Capitalization rates in ENERGY STAR properties were lower by 55 basis points, suggesting a higher value of almost 10%. (Miller 2008)
- Green Star buildings in Australia have a cap rate that is on average 40 basis points lower. (IPD 2011)

#### 7. **Productivity gains** – Several case studies, especially in academic settings, have found increases in worker productivity in green buildings. However, few recent or robust studies support this. One 2003 meta-study from the Center for Building Performance and Diagnostics at Carnegie Mellon analyzed many previous studies and found productivity gains may increase due to: lighting (0.7-23%), quieter working conditions (1.8-19.8%), improved ventilation (0.6-7.4%), and workstation controls (0.2-3%). (Loftness 2003)

#### **US Studies Methodology:**

- The Pivo study analyzed the properties in the office property index produced by the National Council of Real Estate Investment Fiduciaries (NCREIF) from 1998 to 2008. In 2008, this database had 1,114 'control' properties, and 336 'responsible' properties. The study controls for age, height and square footage in comparing properties.
- The Miller, Eicholtz, Fuerst and Wiley studies analyzed the CoStar Group database using hedonic regression analysis. The database includes 200 LEED and 800 ENERGY STAR buildings, as well as approximately 10,000 buildings in the control group. Results differ between the studies because of variations in the definition of what a peer controls building is for each LEED and ENERGY STAR building, as well as variations in the years of data analyzed.
  - Miller compares large Class A offices of similar age, location, size and time of sale.
  - Eicholtz compares buildings of similar age and building quality within a 0.2 square mile area around the certified building.
  - Fuerst compares buildings of similar age and height within the same CoStar sub-market.
  - Wiley looks at 46 metropolitan markets and controls for age, but not for micro-location effects.

### Recent findings and studies in Australia:

In Australia, the Green Star rating is primarily focused on new buildings, and NABERS is the rating system that is more broadly used for existing buildings. Starting in November of 2011 a NABERS rating will be required in order to sell or lease office space over 2000 square meters. Two studies have looked at the influence of these rating systems on building asset value:

- One study – co-sponsored by Johnson Controls – compared 206 NABERS rated office buildings and 160 non-NABERS rated office buildings controlling for building size, building quality and location. The study found that buildings with a 5-star NABERS rating deliver a 9% premium in value, and that 3-4.5 star NABERS energy ratings deliver 2-3% premium in value. (Newel 2011) This analysis also found premiums in rent, reduced vacancy, and higher tenant retention (reduced outgoings) in buildings with higher NABERS ratings. Those buildings with NABERS ratings of less than 3 stars reported significant discounts in value – 10% in Sydney and 13% in Canberra. In addition, the study found a 12% premium in value for Green Star rated buildings.
- A large study released in early 2011 by the Investment Property Databank (IPD 2011). That study reviewed 1500 buildings, about half of which were rated buildings, and concluded that the investment return on buildings with a NABERS Energy rating is 0.6% higher than a non-rated building, and the return is 4% higher with a Green Star rating. (IPD 2011)

### Building Owner Expectations:

Increases in green building value are being seen not only in the building market data, but also in building owner expectations that increasingly match what the data shows. In a McGraw Hill study, building owners expected a 6.8 percent increase in the value of their green-retrofitted building over the next three years. More than two-thirds of building owners expect their buildings that have undergone green retrofits to see increased occupancy. (McGraw Hill 2009)

## CONCLUSION

Studies are consistently showing that the market is pricing green building features like lower energy bills, better design and improved worker productivity. Evidence strongly shows that these features of energy efficient green buildings are translating into greater value in the form of increased rental rates, higher sale prices, increased occupancy rates, lower operating expenses, higher net operating income, lower capitalization rates, and increased worker productivity.

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