HIGH PERFORMANCE GREEN BUILDING: WHAT’S IT WORTH?
Investigating the Market Value of High Performance Green Buildings
This study was made possible by the generous support of the following funders:

![Foundation Logo]  
Washington State Department of Ecology  
![Evergreen Business Capital Logo]

**PROJECT TEAM**

**Primary Authors**

Teddi Wright Chappell, Managing Director, Cushman & Wakefield Washington Valuation Services, Capital Markets Group, National Practice Leader, Sustainability Valuation and Advisory Practice  
Chris Gers, Principal of Asset Strategies, Co-founder, Vancouver Valuation Accord

**Project Manager**

Brandon Smith, Chief Operating Officer, Cascadia Region Green Building Council

**ACKNOWLEDGEMENTS**

The authors would also like to thank the following people for their invaluable contributions to this study.

**Building Participants**

Kathryn J. Baumgartner, LEED AP, Appraiser, Capital Markets Group, Cushman & Wakefield, Inc.  
Ada M. Healey, Vice President of Real Estate, Vulcan, Inc.  
Lori A. Mason Curran, MAI LEED AP, Vulcan, Inc.  
John Russell, President, Russell Development Co.  
Traci Wail, LEED AP, Property Manager, 200 Market Place  
Don Hersch, Senior Vice President, Asset Management, GWL Realty Advisors  
Peter J. Lafort, Manager of Technical Services BC Region, Property Management, GWL Realty Advisors Inc.  
Robert Kavanagh, Vice President, Asset Management, GWL Realty Advisors

**Peer Reviewers and Advisors**

Kathryn J. Baumgartner, LEED AP, Appraiser, Capital Markets Group, Cushman & Wakefield, Inc.  
Sandra Cawley, Principal, Burgess, Cawley Sullivan Appraisers in Vancouver, BC  
Peter Clark, Vancouver Valuation Accord  
Helen Goodland, Executive Director, Light House Sustainable Building Centre in Vancouver, BC  
Sarah Sayce, Professor, Kingston University in London, as well as her colleagues and students

This report is part of a larger collaborative effort among private industry, nonprofit, and government organizations all interested in answering one question: Are high performance green buildings really worth more than traditional buildings? This report encompasses the commercial real estate study. There is also a companion residential study which can be obtained by contacting Earth Advantage Institute, http://www.earthadvantage.org/, (503) 948-7160.

**Steering Committee**

Aaron Adelstein, Master Builders Association King and Snohomish Counties  
Teddi Wright Chappell, Cushman & Wakefield  
Chris Gers, Asset Strategies and Vancouver Valuation Accord  
Fiona Douglas Hamilton, SEE LLC  
Ann Griffin, Earth Advantage Institute  
Rachel Jamison, State of WA Department of Ecology  
Julie McBride, Olympia Master Builders  
Sean Penrith, Earth Advantage Institute  
Brandon Smith, Cascadia Region Green Building Council  
Tiffany Spear, MBA of Pierce County

**CONTENTS**

**HIGH PERFORMANCE GREEN BUILDING**

What’s it Worth?  
May 2009

**INTRODUCTION**

Intended Audiences and Goals .................................................. 3  
Terminology – Sustainability and High Performance Green Building .......... 4  
Background ................................................................................. 5  
Consultants/Authors .................................................................... 5  
Methodology .................................................................................. 6  
Summary of Key Findings ............................................................. 7  
High Performance Green/Sustainable Buildings and the LEED System ....... 9  
Growth of the High Performance Green Building Sector ....................... 10  
Valuation and Appraisal ............................................................... 11  
Valuation Methodology and Approaches ......................................... 13  
New Frontier in Valuation ............................................................. 17

**ALLEY24 EAST, SEATTLE, WA** ................................................ 19  
Executive Summary .................................................................... 19  
Developer ..................................................................................... 21  
Project Description ....................................................................... 21  
Rationale/Business Case ............................................................... 22  
Key Green Features ....................................................................... 23  
Post Occupancy Evaluation and Tenant Satisfaction ............................ 27  
Findings and Valuation Aspects .................................................... 29  
Conclusion ................................................................................... 38  
Interview ..................................................................................... 59

**200 MARKET PLACE, PORTLAND, OR** ..................................... 41  
Executive Summary .................................................................... 41  
Developer ..................................................................................... 42  
Project Description ....................................................................... 42  
Rationale/Business Case ............................................................... 43  
LEED-EB Certification – 200 Market Building .................................... 43  
Key High Performance Green Features ........................................... 44  
Findings and Valuation Aspects .................................................... 47  
Conclusion ................................................................................... 57  
Interview ..................................................................................... 58

**VANCOUVER CENTRE, VANCOUVER, BC** ................................. 59  
Executive Summary .................................................................... 59  
Project Description ....................................................................... 60  
Rationale/Business Case ............................................................... 61  
Key Green Features ....................................................................... 63  
Findings ....................................................................................... 64

This product was funded in part through a grant from Washington State Department of Ecology. While these materials were reviewed for grant consistency, this does not necessarily constitute endorsement by the department.
INTRODUCTION

INTENDED AUDIENCES AND GOALS

Interest and investment in high performance green/sustainable buildings have grown substantially over the last 15 years. Despite this increased attention, these buildings account for only a small percentage of the markets across the United States and Canada.

While there has been a great deal of discussion about the value that these buildings provide, there is a significant disconnect between the building/design community and the financial/investment community on how to quantify and validate this value. Further, there is no consensus between these communities regarding what exactly is meant by the term value. Often, the two groups are using the same words but speaking different languages.

The primary purpose of this study is to help bridge the gap in understanding between these two distinct but interrelated communities by providing information about the valuation of high performance green buildings with a focus on commercial investment office properties.

This study does the following:

• Assesses whether green features impact asset value and market positioning (based on detailed analyses of three commercial office buildings).

• Suggests the potential for an innovative lease structure that can be used to convert operational savings into asset value.

• Expands on past research in this arena, responding to a pressing need in both the green building and financial/investment communities.

The consultants also identified several issues that either potentially affect asset value or have broader market implications. These include government regulation, energy price volatility, and water scarcity. These relate to aspects not valued in current practices but to aspects that are embedded in resources consumed by buildings or emissions created by buildings. These issues may increasingly affect value and/or risk, and create potential liabilities for buildings that do not incorporate high performance features.

Target Audiences

This study provides a new resource to several key professional communities in the commercial real estate sector. After reading this study,

• Architects, designers, contractors, and other members of the building/design community will better understand the valuation perspective of what contributes to the market value of a property. In doing so, they should be able to consider these factors in the initial design process, resulting in more holistic and viable designs with broader investment appeal.
CONSULTANTS/AUTHORS

Theddi Wright Chappell. Theddi Wright Chappell is the managing director of the Cushman & Wakefield Capital Markets Group and national practice leader of the firm's National Green Building and Sustainability Valuation and Advisory Practice. Theddi has been actively engaged in the commercial real estate appraisal and advisory field for over 20 years. She has worked on projects throughout the United States, Canada, Europe, and Asia. Chappell has recently served as the Chair of the Appraisal Institute's Sustainability and Energy Committee, and is a member of the Board of Directors, for the Appraisal Institute. Theddi serves as the lead consultant for the APPraISAL Institute's Green Building and Sustainability Valuation Committee.

BACKGROUND

This project was the collaborative effort among private industry, government, and non-profit to ascertain the high-performance green buildings: Are they high-performance buildings? How do they perform in the marketplace? The project was conducted to analyze and compare the performance of high-performance green buildings with conventional buildings. This project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

This project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.

The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings. The project was conducted in collaboration with the United States Green Building Council (USGBC), which is the national group that develops the LEED (Leadership in Energy and Environmental Design) standards for green buildings.
SUMMARY OF KEY FINDINGS

The following sections present the key findings of the research conducted and supporting information that should follow

1. Gathered information on the green strategies employed at the subject properties.
2. Interviewed building owners, managers, engineers, and others involved in the implementation of green strategies.
3. Interviewed agents, brokers, and other participants in the market regarding the investment and development of green buildings.
4. Compared property-specific information with broader market parameters.
5. Analyzed the properties’ performance relative to other buildings in the same market.
6. Assessed the market impact and tenant retention of green strategies.
7. Market competition goals and historical statistics.
8. Concluded discussions and financial analysis of the projects.
Project 2 – 200 Market Place, Portland, OR

Two-hundred Market Place was the first multi-tenant property in the United States to achieve LEED for Existing Buildings (LEED-EB) Gold certification from the USGBC. Since certification, the building’s owner has continued to improve building efficiency, as evidenced by the building’s ENERGY STAR rating, which has increased from 79 at the time of LEED certification to a rating of 96 in 2009. The following are some of the key findings from the case study:

- Two-hundred Market Place leads its competition in tenant occupancy statistics with a current occupancy of 99.6%. While this high level of occupancy is most likely the result of a variety of factors, it is indisputable that the building is marketed and run as a high performance green property.

- Based on comparisons of the lease rates achieved, tenant improvement allowances offered, and escalation factors, the leases signed at 200 Market Place are similar to and competitive with those signed at comparable properties in the Portland central business district.

- Prior to LEED-EB certification, energy consumption escalated each year from 2004 through 2006. However, since the building’s LEED certification in 2006 and implementation of a variety of energy strategies, energy use declined in 2007 by 3.45% and in 2008 by 8.73%, reflecting increasing year-over-year reductions.

- From 2007 to 2008, overall operating expenses declined by 0.64%, and they are projected to decline by an additional 3.29% in 2009.

- By consistently looking for ways to improve overall building performance, the building owner is reducing the risk of early market obsolescence for the property and ensuring that 200 Market Place will remain a major competitor in the Portland office market for as long as possible.

Project 3 – Vancouver Centre, Vancouver, BC

In 2001, Great West Life Realty Advisors (GWLRA) purchased the 34-story, 472,422 square foot building known as Vancouver Centre at 650 West Georgia Street near Vancouver’s downtown office and retail core. Prior to purchase, GWLRA identified age-related obsolescence in certain capital plant and equipment (e.g., HVAC, lighting) and the potential to improve energy performance with resultant savings. A rolling renovation program was implemented to optimize revenue flow and respect existing tenancies.

- The energy retrofit project achieved a 19% return on investment (ROI). While a payback of four years was anticipated, the extended implementation to minimize tenant disruption meant that the returns took longer but were successful. It also meant that the benefit was directed less towards cash flow and more towards improving vacancy, absorption, tenant retention, and other factors.

- The way in which sustainable attributes translate into value is not simple or direct, and may alternatively be found in other factors such as higher profit, increased staff productivity, or savings in tenant operating costs rather than higher capital value.

- This review concludes that the nature of the retrofit and savings were not pivotal in determining the purchase price of the building to the buyer. The value of the retrofit was known and contributory, but of insufficient size to change the decision to buy the building.

- The study nevertheless concludes that value was received indirectly and distinguishes between savings, cost, and value, illustrating how these are reflected differently in valuation methods. This results in possible confusion about how sustainable attributes affect asset value.

- An incidental finding relates to lease structures and how the relationship between landlord and tenant might be structured to support a sustainable retrofit for mutual profit. It was identified that the same attributes that gave a 19% approximate return on investment (ROI) could increase to 197% provided both parties agree to a lease term and structure more closely matching the life cycle of the retrofit costs and savings; a redistribution of costs aligned with debt retirement; a reallocation of total occupancy payments (e.g., rent, operations, and maintenance costs), without raising the tenant’s total costs; and an apportionment of benefits. If handled carefully, this has the potential to encourage more retrofits by motivating landlords and tenants through mutual profit.

HIGH PERFORMANCE GREEN/SUSTAINABLE BUILDINGS AND THE LEED SYSTEM

Impacts of Buildings

Buildings are significant users of energy, water, and material resources, as well as major contributors to environmental degradation associated with the use of these resources. Without significant increases and improvements in building practices, the negative impact of the built environment on human and environmental health is likely to increase dramatically in future decades.

- Buildings in the United States and Canada represent about one-third of primary energy use and carbon dioxide emissions.

- In the United States, buildings represent about 72% of U.S. electricity consumption.

- Over 136 million tons of building related construction and demolition debris are generated by the United States in a single year, and in Canada, buildings are responsible for 25% of landfill waste.
• In the United States, buildings use about 13.6% of all potable water, or approximately 15 trillion gallons per year.\(^1\)

In response to these issues, a number of countries have created standards to certify buildings that significantly reduce their negative impacts through a variety of factors. In the US and Canada, the predominant rating system for certifying high performance green buildings is the LEED rating system.

The following are the categories that comprise the LEED rating system:
• Sustainable sites
• Water efficiency
• Energy and atmosphere
• Materials and resources
• Indoor environmental quality
• Innovation and design

To earn a LEED certification, an applicant project must satisfy all of the prerequisites and a minimum number of points in the various categories to attain the established project rating levels of Certified, Silver, Gold, and Platinum. Each rating requires a certain range of points be attained by a project.

**GROWTH OF THE HIGH PERFORMANCE GREEN BUILDING SECTOR**

**United States**

The high performance green building sector has been gaining significant momentum over the past 15 years. USGBC membership, which included over 20,000 organizations as of April 2009, has more than quadrupled since 2000. During that same time, the USGBC has certified 2,476 commercial projects and has projects seeking certification in all 50 states and in 91 countries. The USGBC had also accredited 81,115 LEED Accredited Professionals (LEED AP) as of April 2009. By 2010, approximately 10% of commercial construction starts in the United States are expected to be green, and there were 195 state and local government initiatives supporting high performance green building as of December 2008. Current trends in high performance green building indicate that there will be continuing growth in the sector.\(^2\)

**Canada**

As of March 2009, the Canada Green Building Council (CaGBC) had certified 95 buildings under the LEED rating system and had an additional 1,158 buildings seeking certification. CaGBC membership, which included over 2,200 organizations as of March 2009, had grown tenfold since 2003.\(^3\)

**VALUATION AND APPRAISAL**

The recognition and adoption of sustainable principles, practices, and protocols on an international basis has led to more intense investigation of the value proposition of green strategies by real estate owners, investors, and market analysts worldwide. Though a number of practitioners have included sustainable development protocols in their building designs and construction as best practices for years, the incorporation of these practices into mainstream real estate has only occurred relatively recently. That incorporation has most predominantly occurred through the exposure and promotion of these practices by organizations such as the U.S. Green Building Council (USGBC) and the Canada Green Building Council (CaGBC) via the Leadership in Energy and Environmental Design (LEED) standard.

Based on criteria that consider not only economics but also the environmental and social impacts of development, the LEED certification has become the de facto standard of building excellence and sustainability in the United States and beyond. Despite the triple economic, social, and environmental benefits (also known as the triple bottom line)\(^4\) that are espoused internationally, the majority of owners, investors, underwriters, and valuers in the United States and Canada rely upon the concept of market value as the primary basis upon which properties are valued, and investment and lending decisions are made.

Given the breadth and depth of the concept of market value relative to real estate investment, it is the goal of this paper to provide readers with a better understanding of the process used to arrive at market value and how this concept is applied. The goal is to clarify some of the challenges that investors, valuers, and analysts currently face relative to translating the attributes of green development into an estimate of market value. Further, by creating a greater awareness of the methodology utilized to arrive at market value, it is hoped to facilitate a broader exchange of the types of data required to arrive at accurate value estimates of green development.

The challenge that valuers, analysts, and potential investors have is to discern to what degree the various aspects of sustainable development may impact market value. Based on the concept of market value, value is recognized when it is reflected in the form of definitive, quantifiable data. In other words, the financial/investment community requires evidence that a measurable differential exists between traditional and high performance green construction in order to recognize and accept that a differential in market value exists between the two.

This report contributes to market understanding by discussing and analyzing three green properties where the decision was made to incorporate green strategies into

---

building or upgrade programs. These case studies were written to help assess how incorporating these strategies into a development program may impact asset value and market positioning.

Since the case studies are presented from the perspective of a valuation professional or an appraiser, some discussion of the basis upon which value is estimated is provided in the following paragraphs.

**Valuation Standards and Definitions**

Worldwide, a number of standards define how real estate is valued:

- In the United States and most of North America, the Uniform Standards of Professional Appraisal Practice (USPAP) is the defining standard for valuers in developing and reporting an appraisal, analysis, or opinion. Developed by the Appraisal Standards Board of the Appraisal Foundation, USPAP has been adopted by The Appraisal Institute, as well as numerous other professional appraisal organizations.\(^5\)

- In Canada, the Canadian Uniform Standards of Professional Appraisal Practice is the dominant standard published by the Appraisal Institute of Canada.\(^6\) This is closely related to the U.S. Appraisal Institute’s standards.

- The most-used standard by a single profession is the Manual of Valuation, or Red Book, which is published by the Royal Institution of Chartered Surveyors\(^7\) and used by its members in 132 countries.

- Internationally, the International Valuation Standards administered by the International Valuation Standards Council\(^8\) sets an agreed upon standard that multiple countries subscribe to and that is increasingly used as the core global valuation standard.

---

Notwithstanding the multiple standards that exist, the core definitions of value are very similar. This study relies on the U.S. Appraisal Institute’s definition of market value:

> The most probable price, as of a specified date, in cash, or in terms equivalent to cash, or in other precisely revealed terms, for which the specified property rights should sell after reasonable exposure in a competitive market under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeable, and for self-interest, and assuming that neither is under undue stress.\(^9\)

Clearly, this definition of market value relates almost exclusively to the economics associated with the transaction of property rights under consideration, i.e. what something will sell or rent for. Neither the methodology that is currently accepted and practiced by the valuation profession nor the methodology that is typically used by the investment community or major lending institutions includes specific considerations of social or environmental factors. It is largely assumed these are reflected in the price or rent paid in the market.

---

The foregoing recognized, the authors note that the North American valuation theory recognizes four forces that influence real property markets.

- Social forces
- Economic circumstances
- Environmental conditions
- Governmental controls and regulations

These forces are interactive.\(^10\)

It should be noted that three of the four forces (social, economic, and environmental) are components of the triple bottom line, a concept that enjoys greater acceptance and incorporation into investment decisions outside the United States than within. Since the fourth force, government regulation, is arguably the enactment of what society wants, these four influences are consistent with the triple bottom line.

---


\(^6\) See http://www.aila.org/.

\(^7\) See http://www.rics.org/.

\(^8\) See http://www.ivsc.org/.


VALUATION METHODOLOGY AND APPROACHES

The challenge that asset valuers, analysts, and potential investors for high performance green building have is to discern to what degree the various aspects of sustainable development may impact market value. Based on the concept of market value as defined today, value can only be recognized when it is reflected in the form of definitive, quantifiable data.

To determine whether a discernible difference does exist between standard and high performance green properties, there is a specific process that must be followed to arrive at a credible estimate of value. It involves a number of definitive steps, regardless of property type or level of environmental performance:

- Data collection
- Market and marketability analysis
- Land and site analysis
- Improvement analysis
- Highest and best use determination, in which the concept of most probable buyer (the individual or entity most likely to purchase a particular asset and the highest net return to the land) plays a key role

These steps affect not only whether the potential value of high performance green attributes is captured but also how it is processed. This is largely defined by the methodology used to assess value. The most commonly used methodology to arrive at an estimate of market value includes three approaches: the cost approach, the sales comparison approach, and the income capitalization approach.11

Cost Approach

The cost approach is based on the concept that market participants relate value to cost. This can be a reasonable assumption in certain circumstances such as when a property is new and market conditions are stable. It is also often used when there is little or no evidence of market transactions, such as for public assets. Given current economic conditions in the United States and globally, this approach would likely prove less dependable, particularly for an older, existing property. In addition to these limitations, there is currently no readily available national cost estimating database for high performance green development upon which valuers, investors, or other property analysts can rely. In addition, older assets may be more difficult to value using the cost approach as it employs the concept of depreciation from a variety of factors (e.g., obsolescence, functional depreciation, condition, technical impacts) to arrive at an estimate of value, thereby introducing yet another set of variables into the analysis. Since sustainable features can have a longer life, this introduces further complexity in correctly depreciating a green asset.

Considering the foregoing and in the absence of cost data provided by trained professionals experienced in the nuances of high performance green building, the accuracy of this approach at this point must be viewed with some skepticism.

Sales Comparison Approach

The sales comparison approach is most useful when a number of similar properties have recently been sold or are currently for sale in the subject property’s market. Given the comparatively small number of high performance green properties (in relation to the total pool of commercial and residential properties) and the even smaller number of sales of such properties in recent years, there is arguably not a sufficient, statistically relevant pool of information to help appraisers reliably compare and adjust non-green buildings and values to those with green features, or even to compare between green buildings of the same type. This situation has been exacerbated by current economic conditions in which there is a lack of real estate transactions from late 2008 until the time of writing, or even longer in some sectors.

Coupled with limited empirical data, the plethora of options available to a developer with respect to high performance green strategies creates a particularly challenging set of circumstances for the valuation community when it comes to comparison of high performance green assets and attributes. Given that any level of LEED certification can be achieved through a variety of different strategies, two buildings with the same rating (LEED Silver, for example) cannot be assumed to be comparable. In addition to this issue, valuers are also faced with the challenge of comparing high performance green properties to standard properties. Even greater disparities may exist in these situations, despite similarity in visual characteristics. It is also quite difficult to accurately adjust for the value of individual components for use within a sales comparison approach.

Therefore, this approach, similar to the cost approach, must currently be viewed as a less reliable indication of market value, especially when direct comparison is being made.

Income Capitalization Approach

In the income capitalization approach, the current value of the future benefits of property ownership is measured. Given that this study focuses primarily on commercial real estate that is valued on the basis of the quality and quantity of its income stream and adequate operational data is available, this approach currently offers the most reliable indication of market value for a high performance green property.

One of the greatest challenges that many investors face is assessing the viability of sustainable strategies/high performance green development and the impact that its various elements may have on the initial cost of construction.12 Given the integrated approach that is utilized by successful sustainable design teams, construction costs

12 Design professionals often term this first costs. But as any developer or lender will attest, many other costs have usually occurred before a project gets to the design or construction phase.
may be higher than for a traditional building. However, to accurately assess and value high performance green design components, strategies, and development, the costs must be weighed against the benefits derived from these strategies. Incorporation of concepts such as life cycle cost analysis and other methodologies to appropriately compare components and assess performance over either the life or holding period of an investment are necessary to provide a true and accurate indication of value. It should also be borne in mind that sustainable attributes may have a higher residual or reversionary value, which means there is an end-of-life value that has to be considered more carefully with sustainable attributes in green buildings.

Currently, the methodology to accomplish these comparisons lies mainly within the income capitalization approach.

**Options**

In the current economic environment, investors, analysts, valuers, and underwriters are finding that there is limited market data upon which to rely. This theme was prevalent in the preceding sections. However, there are still business decisions that have to be made every day, so those who are required to conduct proper analyses must rely on the limited information that is available. It is important to understand what useful information is available and the minimum factors that should be considered.

**Cost Approach**

- Is there an adjustment that should be made to reflect the long-term benefits of sustainable components or strategies? To accomplish this, one would first have to accurately identify and quantify the long-term benefits.
- What materials/components were used? Will these impact the estimated life of the building or the depreciation assumptions?
- Were incentives offered that could impact/offset some of the building’s costs?
- Does the longevity and benefit of sustainable features affect the depreciation rate and building obsolescence?

**Sales Comparison Approach**

- What are the differences between the physical characteristics of the high performance green building being evaluated and those of its market peers?
- Can these differences be quantified as adjustments?
- Does the market recognize the different elements and will consumers pay [more] for them?
- Will the high performance green elements impact marketability of the property? Will they affect marketing time or other factors?

**Income Approach**

- Was the building commissioned? Commissioning\(^{13}\) could impact assumptions relative to the levels of both operational and performance risk.
- How are the leases structured? Who pays for what and who receives the benefits of any savings?
- How might the high performance green strategies employed impact the following items:
  - Absorption – how quickly a building leases
  - Tenant retention/renewal assumptions
  - Downtime between leases
  - Maintenance and operational costs
  - Utility costs
  - The level of risk associated with the property overall

**Summary**

In many instances, client requirements dictate an appraisal that incorporates all three approaches to value, and the appraiser has to reconcile the different approaches. However, in reality, not all approaches may be applicable. The Uniform Standards of Appraisal Practice (USPAP) guidelines do not require the use of all three approaches, but rather those which are, in fact, most applicable. Therefore, in those instances where all three approaches are not deemed necessary to provide an accurate indication of market value, valuers must explain why an approach was omitted and also indicate which of the approaches provides the most accurate indication of value.

Once these analyses have been completed, the value indications are reconciled into a final estimate of market value, placing the greatest reliance on the approach that was considered the most accurate. In every step of this process, a valuer’s role is to translate market information and reflect market preferences and behavior as the ultimate indication of market value.

**NEW FRONTIER IN VALUATION**

**Value vs. Worth**

This concept is experiencing growing acceptance in European valuation circles, and has application with high performance green asset valuation.

Compared to market value, worth can be used to express aspects that might lack monetization but that nevertheless influence or form an intangible part of market value. An example of this is a living wall (a wall covered with plants): these plants on the vertical faces of a building have aspects [e.g., cost/benefit, savings, market value] that may be difficult to quantify. However, they contribute to how the building is perceived by owners, investors, occupants, and the broader public. Some of this might not find its way into the market value but could nevertheless benefit the occupier, who in essence “pockets the value.”

In a context where high performance green attributes might not always translate to market value, worth is clearly a potentially important concept. However, valuation standards and especially appraisal practices in North America have not yet adapted to formally address this distinction.

\(^{13}\) Commissioning is the process wherein trained professionals, such as mechanical, engineers, test the mechanical, electrical, and plumbing systems to verify that they are operating optimally and as designed.
Resources

- **www.vancouveraccord.org** (access to additional case studies and other information)
- **www.dsierea.org** (for incentives throughout the United States)
- **www.usgbc.org** (U.S. Green Building Council)
- **www.cagbc.org** (Canada Green Building Council)
- **www.appraisalinstitute.org** (seminar on valuing green buildings)
- **www.rics.org** (information from the Royal Institute of Chartered Surveyors)
- **www.rmi.org** (Rocky Mountain Institute)
- **www.greenbuildingfc.org** (Green Building Finance Consortium)

**ALLEY24 EAST**
221 Yale Avenue North, Seattle, Washington, USA

**EXECUTIVE SUMMARY**

Alley24 East is a mixed-use office development located in the South Lake Union neighborhood of Seattle. It is composed of two buildings that are connected above ground level: the south tower is six stories and the north tower is five stories. The development was completed in February 2006. It was one of the first mixed-used developments in Seattle to achieve LEED® Core & Shell Silver certification by the U.S. Green Building Council in 2007. The project was awarded Sustainable Development of the Year and Mixed-Use Development of the Year awards in 2006 by the Washington Chapter of the National Association of Industrial & Office Properties (NAIOP). The following comments summarize some of the key issues from the study:

- When the building was delivered, it was 90% preleased. It should be noted that this is an impressive amount of preleasing under any circumstances. Given the somewhat unproven locational attributes of the site at the time of construction, preleasing at this level is a tribute to the ownership’s ability to target and sign the tenants best suited for the building and the ownership’s insight into emerging market preferences for high performance green development.

- Leases signed at Alley24 East were competitive with other properties in terms of rental rates, escalations, and tenant improvement allowances. Specific data indicate that Alley24 East held a strong competitive position relative to its peers, while at the same time exceeding
industry averages for rent and occupancy. As evidenced by both the property specific and general occupancy data presented in this study, Alley24 East continues to experience above average occupancy and achieve competitive rental rates at the same time.

- While the long-term implications of the various high performance green strategies employed at Alley24 East can only be quantified via specific and detailed analysis over time, it is clear that the property:
  - experienced a comparatively quick absorption period;
  - attracted and retained high-quality tenants;
  - achieved competitive rents;
  - and has a higher-than-average level of occupancy.

- Tenant rankings of Alley24 East in the New Building Institute’s Building Performance Review reflected high or moderately high scores in tenant satisfaction related to building temperature, air quality, acoustics, lighting, and general health and productivity factors.

- Alley24 East received enhanced commissioning. From a risk and valuation perspective, this is perhaps one of the most important components of the entire LEED certification process. In fact, this integral step in attaining a LEED certification could be one of the most important aspects of LEED certification as it relates to asset value. By providing third-party validation of the operational efficiency and anticipated performance levels of building systems by trained professionals, these vetted assumptions can be incorporated into a formal valuation or evaluation analysis.

- Building management provides ongoing accountability of energy consumption using meters that monitor electricity usage for each tenant. This benefits tenants and owners since both parties can track and manage utility use. This is unlike developments with one master meter where some tenants may be allotted a pro rata share of energy costs based on square footage regardless of actual energy usage. In such situations, tenants that use less energy may be paying more than their fair share of energy costs if the building power source is shared with tenants with above average usage, such as call centers. Given the implications of individual metering, more owners implementing this practice and more tenants requesting it can be expected. It is quite possible that individual metering will become a more common component in green lease clauses, being negotiated by one or both parties in the transaction.

- One of the greatest variables in operational/building performance (and generally one of the most difficult to control) is tenant behavior. SS Credit 9 Tenants at Alley24 East are provided with illustrated tenant manuals, educating them and facilitating implementation of high performance green design and construction strategies within their spaces. Educating tenants on how they should operate in a high performance green space can make a notable difference in tenant and owner satisfaction. More satisfied tenants can lead to improved tenant retention and less downtime between leases, ultimately resulting in better bottom line results.

**DEVELOPER**

Vulcan, Inc. was founded in 1986 by Paul G. Allen, a cofounder of Microsoft Corporation. The Seattle-based company was set up with Jo Allen Patton to manage Allen’s business and charitable endeavors. Vulcan, Inc. oversees several business ventures, including Vulcan Real Estate, which has a significant presence in Seattle largely due to its participation in the redevelopment of the South Lake Union neighborhood. Vulcan Real Estate has demonstrated a commitment to sustainable real estate through a variety of development projects, including Alley24 East.

**PROJECT DESCRIPTION**

<table>
<thead>
<tr>
<th>Address</th>
<th>221 Yale Avenue North</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Building Area (Square Feet)</td>
<td>Office: 186,299 Retail: 24,557 Total: 210,856</td>
</tr>
<tr>
<td>Date Completed</td>
<td>February 2006</td>
</tr>
<tr>
<td>Owner</td>
<td>Vulcan Inc. / PEMCO Mutual Insurance Company</td>
</tr>
<tr>
<td>Developer</td>
<td>Vulcan Real Estate</td>
</tr>
<tr>
<td>Architect</td>
<td>NBBJ</td>
</tr>
<tr>
<td>Builder</td>
<td>Skanska USA</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>$42,000,000</td>
</tr>
</tbody>
</table>
Alley²⁴ East is composed of two mid-rise buildings with 24,657 square feet of ground floor retail and 186,299 square feet of office space above, for a total net rentable building area of 210,856 square feet. The six-story south building connects above the first floor with the five-story building. The buildings, which were finished in 2006, are situated on a four parcel assemblage totaling 0.98 acres. The complex incorporates a European-style alley running along the west side.

The ground level features a variety of retail, restaurant, and service tenants, including a winter gear store, a spa, a golf instruction store, and a physical therapist. The office tenants include NBBJ (Alley²⁴ East architect), Skanska USA (Alley²⁴ East builder), and the Northwest Lions Foundation. The building has 366 underground parking stalls, or 1.74 parking stalls per 1,000 square feet of net rentable area. It should be noted that the garage is shared with Alley²⁴ West.

The adjacent residential building, Alley²⁴ West, contains 172 apartments and ground-level townhomes, as well as two street-level restaurants. While Alley²⁴ West is not the focus of this case study, it should be noted that it has also reaped the benefits of being a green development. Residential leasing started in February 2006, and reached stabilization in May 2007. As of March 2008, rents were more than $2 per square foot per month, which represented a 14% increase since the building’s opening.

Alley²⁴ East achieved LEED for Core & Shell Silver certification by the U.S. Green Building Council in 2007. It incorporates many green features, including natural daylighting, operable windows for fresh air, energy and water efficient fixtures, outdoor sun shades, and a hybrid HVAC system. The project had an ENERGY STAR® rating of 97 in 2008.

Alley²⁴ East was awarded Sustainable Development of the Year and Mixed-Use Development of the Year awards in 2006 by the Washington Chapter of the National Association of Industrial & Office Properties (NAIOP).

**RATIONALE/BUSINESS CASE**

According to Brandon Morgan of Vulcan Real Estate, the company is guided by the *triple bottom line* philosophy, which is based on creating new value across the entire community. The three principles of the triple bottom line philosophy are generating a market return on investments, making a positive impact on the community through quality design and development, and protecting the environment through high performance green development.¹⁴ It is this philosophy that led Vulcan Real Estate to develop the Alley²⁴ site and pursue LEED certification.

Vulcan, Inc. developed Alley²⁴ East with the goal of merging green practices into a high-functioning building and attracting quality tenants into an emerging market location. Alley²⁴ is located in the Cascade neighborhood in the South Lake Union area of Seattle. Prior to initiating this venture, Vulcan had already acquired a number of other parcels in the same area in hopes of leveraging Seattle’s evolving biotech industry.

The development’s incorporation of portions of a historic onsite laundry and its pedestrian orientation are closely aligned with the overall redevelopment strategy for the broader area. The name, Alley²⁴, acknowledges both the project’s alley-based design and the laundry workers’ union, Local 24, which is believed to be responsible for the only all-woman strike in U.S. history.

Alley²⁴ East was one of the first mixed-used developments in Seattle to achieve LEED certification.

**KEY GREEN FEATURES**

The high performance green aspects of the development will be assessed in context of the LEED standard created by the USGBC. The LEED certification process is often viewed by developers as a framework upon which they can formulate high performance green strategies. As defined by the USGBC, the elements of high performance green development that comprise the LEED rating system are identified in the following list with the number of points in each section of LEED Core & Shell (LEED-CS) version 2.0 in parentheses:

- Sustainable Sites [15]
- Water Efficiency [5]
- Energy and Atmosphere [14]
- Materials and Resources [11]
- Indoor Environmental Quality [11]
- Innovation and Design [5]

To earn LEED-CS certification, the applicant project must satisfy all of the prerequisites and a minimum number of points to attain the established LEED-CS project ratings. The following list details the number of points required to achieve different levels of LEED-CS certification.¹⁵

- Certified 23 – 27 points
- Silver 28 – 33 points
- Gold 34 – 44 points
- Platinum 45 – 61 points

The strategies that were employed at Alley²⁴ East to achieve points in each of the categories for LEED-CS Silver certification are discussed in the paragraphs that follow.

**Sustainable Sites**

The project achieved nine points in this category. The following strategies were employed to achieve these points:

- The development is situated in an urban area with a high development density that is near existing infrastructure, thereby reducing requirements for new infrastructure.
- The previously developed site was contaminated with hydrocarbons and hydraulic fluid from an adjacent laundry facility. The site was cleaned by the developer prior to starting construction.
- The property is located near several bus stops, reducing land development impacts from automobile use. Greater access to public transportation allows convenient transport to and from work for employees, visitors, and clients.

Low-flow toilets and sinks were also installed. As a result, water usage is much less than that of comparing non-green buildings and industry averages.

**Energy & Atmosphere**

Alley 24’s primary energy source is the municipal electrical grid. The project achieved six points on the basis of the following facts:

- Madison Engineering, P.S.
- The development process included enhanced commissioning that was conducted after the system's performance was completed. It is important to note that the building's energy performance and compliance with ASHRAE 90.1 1999 standards.
- According to NBI’s building performance review, Alley 24 East achieved an ENERGY STAR score of 77 as a result of its energy-efficient building system, allowing the building to work with the national building stock in terms of energy efficiency.

Alley 24 East achieved six points for materials and resources. The factors for which the points were awarded include the following factors:

- The development incorporated construction practices that eliminated 75% of construction debris from disposal in landfills and incinerators.
- At least 20% of the building materials utilized in the development were manufactured in the region.

---

**Water Efficiency**

Alley 24 East achieved two points for water efficiency. Points were achieved for the following features:

- Water usage was reduced to 20% below the calculated baseline for the building, lessening the burden on the municipal water supply and reducing utility costs.
- Low-flow urinals in the restrooms use about one-eighth of a gallon per flush.
- The building’s parking facilities are located underground, reducing the development’s heat island effect. A further reduction in the incorporation of rooftop gardens, which also serve to absorb storms, results in current on-site parking.
The project incorporated pre- and postconsumer recycled materials, which, when combined, accounted for at least 20% of the total cost of the materials in the project.

**Innovation & Design Process**

Exceptional performance in any category can earn points in the Innovation & Design Process category of LEED. Alley24 East achieved four points in this category. Points were awarded for the following items:

- The project used local materials in excess of levels required by LEED.
- A tenant manual was provided to help tenants properly use green cleaning solvents and other environmentally friendly cleaning materials.
- The building includes enough parking for Alley24 East and the adjacent apartment complex, with all of the parking located underground.
- The last point in this category was awarded because at least one principal participant of the project team was a LEED Accredited Professional.

Tenants at Alley24 East are also provided with illustrated tenant manuals, educating them about the features of the building and allowing them to facilitate implementation of high performance green design and construction strategies within their spaces.

**Development and Certification Costs**

The development costs for the project are summarized in Chart 1. While items such as furniture, fixtures, and equipment are not included in a typical real estate appraisal, the majority of the other cost categories shown are standard. The numbers provided do not reflect a premium for strategies, components, or construction costs specifically attributed to high performance green elements.

Due to their dedication to the triple bottom line and a belief that asset value would be enhanced over time, Vulcan made the decision to take Alley24 East through the LEED Core & Shell certification process. This process was managed by EGIS Real Estate, a real estate service provider in the Seattle area. EGIS worked independently with the general contractor, architect, property manager, and owner to compile all the information needed to submit for certification. Those costs that could be directly attributed to the certification process are summarized in Chart 2.

The $79,000 attributed to LEED for Core & Shell certification costs do not incorporate any of the hard or general contractor costs, which were separated when the building was built. The hard cost of construction for Alley24 East was approximately $23 million, with the LEED certification costs representing 0.2% of the total construction cost. The USGBC average LEED certification cost for a Silver certified building is 1.0% of the total construction costs. The certification costs for Alley24 East are significantly below the USGBC average on a percentage basis, and reflect similar findings from a growing number of projects that have reported experiencing little or no premium for LEED certification. In the majority of similar cases, this positive result is achieved by using an integrated team of professionals, experienced in both the LEED process and high performance green building practices.

It is also worth noting that two of the major tenants at Alley24 East chose to go through the LEED for Commercial Interiors (CI) certification process. Both NBBJ Architects and Skanska achieved certification for their tenant build-outs: NBBJ achieved LEED-CI Gold certification and Skanska achieved LEED-CI Silver.

**POST OCCUPANCY EVALUATION AND TENANT SATISFACTION**

Tenant satisfaction is influenced by a variety of factors, but the concept of a healthier working environment and potential for enhanced worker productivity is increasingly playing more of a role in the selection of office space. Tenant rankings of Alley24 East in a building performance review by the New Building Institute [NBI] reflected high or moderately high marks in tenant satisfaction related to building temperature, air quality, acoustics, lighting, and general health and productivity factors.

While this remains one of the most touted benefits of high performance green development, it should be noted that this potential benefit is extremely hard to capture in a market value analysis. Even if it can be shown that worker productivity is enhanced by location in a green facility, the benefits of that increased productivity do not necessarily flow to the property or the property owner and therefore do not flow to asset value.

| Site Acquisition/Land Carry Cost   | $9,828,000 |
| Site Improvement Costs            | $8,555,000 |
| Excavation/grading                | $2,482,000 |
| Sewer/water/drainage              | $345,000   |
| Paving/curbs/sidewalks            | $273,000   |
| Landscaping/irrigation             | $348,000   |
| Fees/general conditions            | $5,107     |
| **Construction Costs**             | **$60,998,000** |
| Office/realtor                     | $38,007,000|
| Residential                        | $19,704,000|
| Consultants                        | $1,767,000 |
| Furniture, fixtures and equipment  | $454,000   |
| Utility relocation/hookup          | $299,000   |
| Permits/other                      | $767,000   |
| **Soft Costs**                     | **$12,749,000** |
| Architecture/engineering           | $4,356,000 |
| Project management                 | $3,164,000 |
| Leasing/marketing                  | $1,898,000 |
| Legal/accounting                   | $947,000   |
| Taxes/insurance                    | $673,000   |
| Title fees                         | $67,000    |
| Construction interest/fees         | $1,535,000 |
| Other/miscellaneous                | $109,000   |
| **Total Development Costs**        | **$92,130,000** |

Source: Urban Land Institute

Chart 2. LEED for Core & Shell Certification Costs.

| LEED/Commissioning Consultant       | $50,000   |
| Energy Modeling                     | $28,000   |
| USGBC Costs                         | $1,000    |
| **Total LEED Cost**                 | **$79,000** |
| Alley24 East Hard Construction Cost | $38,007,000|
| **LEED Certification Cost/Total Cost** | **0.2%** |
| USGBC Average LEED Silver Cost      | 1.0%      |

Source: Vulcan Real Estate

Until there is a greater body of empirical data on this issue, the valuation and underwriting communities are relegated to quantifying the benefits of enhanced tenant satisfaction through more traditional analyses of how this consideration might be reflected in terms of marketability, velocity of space absorption, rent levels, occupancy, downtime between leases, and operational performance and costs.

**FINDINGS AND VALUATION ASPECTS**

As noted in the introduction to the case studies, there are a variety of factors that may impact the market value of a particular asset. First and foremost, the valuation, investment, and lending communities look for empirical data upon which they can base their analyses. Whether data relates to a property’s market place or marketability, any information that can be documented by quantifiable factual data is preferred. Only in instances where hard data is not available are the intangible aspects of a particular property type considered useful to the determination of value (e.g., the role of ambience in the success of a retail shopping center). This is also the case in situations where anecdotal information is valuable to characterize or better explain a particular aspect of the property or market (as opposed to factual data typically incorporated into a valuation or investment analysis).

There are a number of elements cited in this case study that could have a bearing on the broader concepts of asset and market value. Developers, owners, investors, and valuation professionals should be familiar with those elements. By identifying and discussing some of these items, it is the belief of this research team that the building/design communities and the financial/investment communities will better understand the relevance of various high performance green elements and strategies as they relate to market value.

The discussions of project characteristics and the description of the strategies employed to achieve various points toward LEED certification reveal a number of factors that could have direct and indirect impacts on asset value.

For example, in describing the project, it is noted that tenants received an illustrated tenant manual that included information about sustainability and how they could implement high performance green design and operations in their own spaces. While such a manual might appear to some as a piece of promotional material, it could actually be a critical component in achieving maximum building performance.

One of the greatest variables in operational/building performance and generally one of the most difficult to control is tenant behavior. The best-designed development in the world can have its operational performance seriously impeded by tenant behavior: excessive overtime or utility usage by one tenant can skew operational results, significantly and negatively impacting bottom line results, and potentially diminishing asset value. Educating tenants on how
they should operate in a high performance green space can make a notable difference in tenant and owner satisfaction.

Similarly, there are a number of value-related issues under the various categories for which points can be earned. These are organized and discussed by LEED category and summarized in the following discussions.

Energy & Atmosphere

While actual total utility costs at Alley24 East remain below utility expense levels of other non-green buildings in the market, Madison Engineering, P.S. initially modeled electricity costs for Alley24 East at $118,202 per year, which was somewhat below the actual electricity costs of $153,555 in 2007. However, according to a building performance review17 completed by the New Buildings Institute (NBI), energy modeling assumptions underestimated building energy use, and going forward, will require recalibration. This is not uncommon in new buildings where typical patterns of tenant occupancy and utility use have not yet been determined. In fact, energy modeling provides an excellent indication of potential energy usage provided that the assumptions are correct. Similar to cash flow analysis used in the valuation process, energy modeling is comprised of a number of assumptions based on anticipated usage. Just as with discounted cash flow analysis (DCF), the validity of assumptions made is directly proportional to valid results.

Common market vernacular for this situation is, “garbage in: garbage out.” From a valuation perspective, the message here is that adequate due diligence relative to the nature of the tenant base and their anticipated use of energy is imperative. Who are the tenants? What are their businesses? What demands will they make on heating, cooling, and energy overall?

At Alley24 East, ownership had the foresight to individually meter the tenant premises for electricity usage. It is anticipated that this practice will become more common going forward since it facilitates accountability for energy use on a tenant-by-tenant basis. Not only is this an incentive for individual tenants to use energy more responsibly, but it allows building owners to recoup costs from tenants on a more equitable basis, a benefit to tenant and landlord. Individual metering prevents a pro rata distribution of energy costs wherein some tenants with excessively high energy use benefit when costs are distributed among all the tenants on a pro rata/square foot basis. Given the implications of individual metering, it is expected that more owners will implement this practice and more tenants will request it.

It is quite possible that individual metering will become a more common component in green lease clauses, being negotiated by one or both parties in the transaction. The principle behind a green lease clause is to address who benefits and who pays for high performance green features and upgrades by restructuring the landlord-tenant relationship. If individual metering is in place at a property, it impacts expense and recovery provisions and hence the bottom line. Valuers and underwriters must determine who pays for what costs (installation of meters and monitoring) and whether there are financial benefits to the property that will impact asset value. Despite the common misconception that energy savings can be directly capitalized and added to asset value, there are many other determinations that must be made prior to ascertaining whether a particular strategy has an overall impact on value, including cost benefit analyses to assess initial costs compared to long term benefits.

One final point worth noting in the discussion on Energy & Atmosphere is the fact that the property achieved an ENERGY STAR rating of 97%. While the discussion is ongoing as to whether there is actual value in the LEED brand, there is no question that a good ENERGY STAR ranking has become a base case scenario for investment grade real estate. With the current focus on energy and climate issues, as well as carbon dioxide emissions, energy efficiency is becoming a major goal of owners, investors, and other market participants at all property levels. It is common knowledge that disclosure of energy performance for buildings is mandated in the United Kingdom and, based on some of the recent legislation in progressive states such as California, this practice or some form of it may not be far behind in the United States.

A growing number of market analysts, investors, and owners believe that energy characteristics and building performance will play a significant role in the determination

---

A Final Note on the LEED Process: Commissioning

It was noted in the study that Ally24 received enhanced commissioning, the opinion of growing number of valuers and investors is that commissioning is too expensive and consequently some very high profile developers are looking at alternative methods. This is a significant factor from the perspective of the process where considerable value is generated by the professionals, such as mechanical engineers, electrical and plumbing systems. It is imperative that the risks are not only for performance, but also for expense of information, representation, and the expert's experience, reputation, and the information provided by the commissioning process can be relied on not only for performance, but also for the valuation of the project.

Outdoor Environmental Quality

The innovations incorporated into indoor environmental quality (IEQ) resulted in benefits and challenges to the owner and tenants. The utilization of new HVAC systems can result in significant savings, however, this will also require a significant investment in the systems in place as the differences between the systems can be significant. Further, investment in the systems is not always feasible, especially in older buildings.

Materials & Resources

Twenty percent of the building materials used in the building were recycled, and 25% of the materials were certified, and 15% of the materials were certified sustainable. The use of recycled materials will have a significant impact on the environmental footprint of the building.

The value of water is not only critical in the construction industry, but also in the health and well-being of the building's occupants. The project achieved significant savings in water usage, while maintaining the required water quality. The use of recycled water will help to reduce the demand for fresh water, thus reducing the environmental impact of the building.

Factors in their investment criteria include the potential for increased energy efficiency, reduced maintenance costs, and improved comfort for the tenants. However, the most significant factor is the potential for increased value in the future. A building with a superior environmental performance will likely command a premium price in the market, and this is reflected in the increased value of the property.
of perceived risk. If an in-depth analysis of building systems performance can be made and an unbiased, informed projection of operational systems validated by a team of qualified professionals, the level of risk associated with such projections would be diminished. In simple terms, all other factors being equal, less risk means higher values. If this project or any other goes through a sound commissioning process, the level of perceived risk associated with building operations should be diminished.

Based on the information that qualified commissioning agents provide, the investment, lending, and valuation communities can make more accurate assessments of building performance, which translates into a better ability to project costs and potential savings. Further, having documentation that all systems are operating at maximum efficiency allows an investor or analyst to feel more confident about the level of operational and performance risk associated with a particular investment. It follows that this process could result in a lower level of risk being associated with commissioned buildings. All other factors being equal, lower risk results in lower rates (yield), which results in higher property values.

**Market Evidence and/or Empirical Data**

As was noted in the introduction to the case studies, the valuation, investment, and underwriting communities prefer to rely on actual market evidence (documented investor behavior) and other empirical data (e.g., information on closed sales, published statistics) in their analyses. Due to the fact that high performance green development has only gained traction in the United States on a broad scale within the last 15 years, this type of data is quite limited.

Certified high performance green buildings represent only a fraction of existing commercial buildings, and available information does not constitute a statistically relevant body of data upon which the appraisal, lending, or investment communities can make either pro or con industry assumptions relative to green developments. Instead, the real estate community must currently view high performance green projects on a case-by-case basis and complete a more extensive level of due diligence on these properties to accurately assess their relationship to other market and investment opportunities. Given the absence of sales in the current economic environment, any specific information available on tenancies and operational expenses is critical to a proper analysis of a green property. Unfortunately, most owners consider this information proprietary, and valuers and other investors and lenders are forced to make more assumptions relative to these issues than they would like.

The information presented in the following discussions represents a compilation of data from property ownership and management, broker interviews, and discussions with other market participants, as well as other data that has been published about Alley24 East.

**Rental Rates**

Construction of Alley24 East began in 2004 and was completed in February 2006. Leasing began in 2004, and when the building was delivered, 90% had been preleased. It should be noted that this is an impressive amount of preleasing under any circumstances. Given the somewhat unproven locational attributes of the site at the time of construction, preleasing at this level is a tribute to the ownership’s ability to target and sign tenants who were best suited for the building. It can also be attributed to the ownership’s insight into emerging market preferences for high performance green developments.

Though the authors of this paper were unable to acquire information on all tenant leases in the building, lease data on the major tenants was available in confidential files. In order to compare Alley24 East to other investment opportunities or to evaluate the property for either valuation or underwriting purposes, lease data from Alley24 East would be compared to information gathered on other buildings in the same market that are considered competitors.

The optimal scenario to conduct a valuation of the property would be to compare the rents achieved at Alley24 East to the rents achieved at other comparable, high performance green properties. However, since Alley24 East was one of the first LEED certified office buildings in the Seattle market, there is minimal data on other green buildings that would be seen as competition.

Therefore, a prudent investor, valuer, or underwriter who wants to compare Alley24 East to its competition must use available data to extrapolate value or investment implications. To that end, the authors of this paper compiled a set of non-green comparables in which leases were signed during the same period as Alley24 East’s initial absorption period. These data are presented in Chart 3.

**Chart 3. Non-green comparable buildings with leases signed during the same period as Alley24 East.**

<table>
<thead>
<tr>
<th>Building Name &amp; Address</th>
<th>Year Built</th>
<th>Unit Size (NRA)</th>
<th>Lease Date</th>
<th>Effective Rent ($/SF)</th>
<th>Lease Type</th>
<th>Free Rent</th>
<th>TT's</th>
<th>Escalations (per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fifth &amp; Bell Building 2301 4th Ave.</td>
<td>2002</td>
<td>15,138</td>
<td>12/03</td>
<td>$27.00</td>
<td>Net 0</td>
<td>$45</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Fifth &amp; Bell Building 2301 4th Ave.</td>
<td>2002</td>
<td>27,762</td>
<td>08/07</td>
<td>$35.50</td>
<td>Net 0</td>
<td>$50</td>
<td>$1/sf</td>
<td>3%</td>
</tr>
<tr>
<td>Westlake &amp; Terry 320 Westlake Ave N</td>
<td>2007</td>
<td>128,956</td>
<td>09/07</td>
<td>$29.00</td>
<td>Net 0</td>
<td>$40</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>818 Stewart 818 Stewart Street</td>
<td>2008</td>
<td>81,804</td>
<td>10/07</td>
<td>$26.00</td>
<td>Net 0</td>
<td>$49</td>
<td>3.5%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Cushman & Wakefield
The authors also reviewed the CoStar database (one of the most widely used sources of lease and sales information in the continental United States) to ascertain asking rents during Alley24 East's absorption period. While asking rents are not signed leases, they typically serve as indications of the high end of potentially achievable rental rates.

Chart 4 reflects average lease rates achieved for Class A office properties built after 1995 in the Denny Regrade/Lake Union submarket during the Alley24 absorption period. It should be noted that these rents have been adjusted from full service rates to triple net rates by deducting typical (time-adjusted) Class A operating expenses ($9) from the full service rate. The rental rates achieved in the first two quarters of 2006 were significantly different from those in the last two quarters, and have therefore been split into separate categories.

A comparison of the information presented in Charts 3 and 4 to the confidential lease data that tenants signed at Alley24 East were competitive with other properties in terms of rental rates, escalations, and tenant improvement allowances. Specific data indicate that Alley24 East held a strong competitive position relative to its peers, at the same time exceeding industry averages reflected by the broader CoStar data.

Chart 4. Average lease rates achieved during the Alley 24 East absorption period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Asking Rate (NNN equiv.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>$20.39</td>
</tr>
<tr>
<td>2005</td>
<td>$20.92</td>
</tr>
<tr>
<td>1st half 2006</td>
<td>$21.24</td>
</tr>
<tr>
<td>2nd half 2006</td>
<td>$24.22</td>
</tr>
<tr>
<td>2007</td>
<td>$27.36</td>
</tr>
</tbody>
</table>

Source: CoStar

It should be noted that very few leases were signed during this time frame, particularly in the South Lake Union and Denny Regrade markets. Therefore, Alley24 East was one of the most active buildings in the market in terms of leasing activity, reaching full occupancy in September 2007. This factor, the enhanced velocity of space absorption, reflects a benefit to the owner in terms of revenue generation and abbreviated carrying costs. As in a number of green developments that have been analyzed, Alley24 East achieved top of the market, competitive rents, though with no identifiable premium for high performance green features.

Further, numerous discussions with owners of and investors in high performance green buildings – both new and existing – have not revealed a premium specifically attributed to green features. Rather, in the majority of cases, the top of the market rents achieved by these properties result from a combination of factors which include locational attributes, physical characteristics (green features), and overall market environment. Until such time as there are significantly more data available, the authors of this paper caution against using unsupported or poorly supported assumptions relative to green premiums.

### Occupancy Levels

Occupancy levels at a property are a significant factor in estimating value, or in establishing investment or lending guidelines relative to a particular development. The ability to attract and retain tenants is critical to a property’s viability and a strong indicator of its marketability. Given the turmoil and uncertainty in the current property markets, even more emphasis is being placed on current occupancy and revenues in place. Chart 5 tracks occupancy at Alley24 East.

**Chart 5. Alley24 occupancy.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Space Leased</th>
<th>Space Available</th>
<th>Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction Period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan-03</td>
<td>85,000</td>
<td>100,000</td>
<td>45.95%</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04 to Feb-06</td>
<td>166,500</td>
<td>18,500</td>
<td>90.03%</td>
</tr>
<tr>
<td>Post-Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sep-07</td>
<td>18,500</td>
<td>0</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Vulcan Inc.

As a comparison, occupancy statistics for the submarket in which Alley24 East is located were compiled using CoStar data. Occupancy rates for buildings constructed after 1995 in the Denny Regrade/Lake Union submarket are shown in Chart 6.

**Chart 6. Occupancy rates for buildings constructed after 1995 in Denny Regrade/Lake Union submarket.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>77.8%</td>
</tr>
<tr>
<td>2005</td>
<td>76.5%</td>
</tr>
<tr>
<td>1st half 2006</td>
<td>78.3%</td>
</tr>
<tr>
<td>2nd half 2006</td>
<td>93.03%</td>
</tr>
<tr>
<td>2007</td>
<td>91.52%</td>
</tr>
<tr>
<td>2008</td>
<td>89.10%</td>
</tr>
</tbody>
</table>

As evidenced by both the property specific and general occupancy data presented, Alley24 East continues to experience above average occupancy and achieve competitive rental rates at the same time. Reflection of early and continued high occupancy levels is generally attributed to the attractiveness/marketability and quality of the asset, good property management, and other market factors.
While it is difficult to attribute the continued high occupancy of Alley24 East to any one factor, it is a fact that the building was designed and marketed as a high performance green facility. The three major tenants occupying space in the building all have a commitment to environmental responsibility. In the cases of at least two of these tenants, this commitment was a major factor in their decisions to lease space at Alley24 East.

Therefore, the relationship between occupancy and Alley24 East’s green features should be explored when assessing its market position, investment potential, valuation, or underwriting parameters. As with almost any property specific factor or consideration, a good analyst must have a clear understanding of the market values to arrive at an accurate estimation of market value.

CONCLUSION

Alley24 East was developed using high performance green strategies and features, documented by its LEED Silver for Core & Shell certification by the USGBC. Since achieving LEED certification, the building has experienced high levels of occupancy and tenant satisfaction, which the property manager attributes at least in part to the green features of the building.

While the long-term implications of the various high performance green strategies employed at Alley24 East can only be quantified via specific and detailed analysis, it is clear that the property

- experienced a comparatively quick absorption period;
- attracted and retained high quality tenants;
- achieved competitive rents;
- and has higher-than-average levels of occupancy.

These factors indicate that as an owner and investor, Vulcan, Inc. made prudent selections of the property characteristics incorporated into Alley24 East. It is apparent through both the rental and occupancy comparisons with industry norms that the owner’s decisions have given it a competitive advantage in the Seattle market. Though the exact impact of the green strategies employed at Alley24 East on the project’s market value cannot be quantified, it is obvious that their influence is positive. In an actual valuation scenario, a valuer has access to specific data on a property’s absorption, revenue, lease, and operating expense information, as well as other related market data. Equipped with this information, the specific impacts of various strategies should be analyzed to determine their potential impacts on the property’s market value.

The caveat should be mentioned that every market is different, particularly in relation to high performance green building. It is the valuer’s job to interpret market practice and investor behavior and recognize the nuances in each of them relative to the property that he or she is evaluating. There is currently great diversity in the level of recognition and adoption of high performance green practices in the United States. Therefore, while

the impact of green strategies may be clear in one market, it is the valuer’s responsibility to determine the market environment for high performance green features on a case-by-case basis. Failure to do the requisite amount of due diligence in evaluating or valuing a high performance green property could prove costly for both the owner/developer and the valuation professional. While markets differ in their preferences, it is clear from the high rate of growth of high performance green building and LEED across the US and Canada that these preferences are likely to become more common across more markets in the near future.

INTERVIEW

As part of this research, Ms. Ada M. Healey, vice president of real estate at Vulcan, Inc., was interviewed in an effort to glean her insights on Alley24 East from an owner/developer’s perspective. Alley24 East was one of Vulcan’s first LEED projects, and she indicated that the learning curve was steep.

Healey noted that they experienced the typical challenges in developing a property with new features, with which contractors and subcontractors were unfamiliar. The building was preleased to several tenants, and so there was a push to meet all delivery deadlines. This seemed difficult at times given the increased risk in using cutting-edge features. Healey estimated that after building delivery, it took about six months to get all features running efficiently and effectively, including the operable windows, subfloor HVAC, and waterless urinals.

Though the property faced some initial challenges from an operational standpoint, it is largely viewed as a major success. Healey said that Vulcan is very proud of the development, and that tenants have been very satisfied. NBBJ, an anchor tenant, has reported a 10.3% increase in net fee revenue per FTE (productivity per person) since moving into its space. Skanska, the other major tenant, reports a 30% decrease in sick days. In addition, 41% of the 1,000+ employees in the building utilize transit options other than single occupancy vehicles.

Healey believes that there is additional value and competitive advantage in the enhanced marketability achieved by the Alley24 East project. She noted that its LEED certification was certainly a factor in achieving this competitive advantage, though not the only factor. Alley24 East’s LEED certification was part of the whole package of the property, and given its successes in terms of efficiency and tenant satisfaction, Vulcan would and indeed has used high performance green practices and products in other developments.
EXECUTIVE SUMMARY

Built in 1973, 200 Market Place is a 19-story, 383,358 square foot office building located in downtown Portland, Oregon. In 2006, 200 Market Place was the first multitenant property in the United States to achieve LEED® for Existing Buildings (LEED-EB) Gold certification from the U.S. Green Building Council (USGBC). Since certification, the building owner has continued to improve building efficiency, as evidenced by the building’s ENERGY STAR® rating, which has increased from 79 at the time of LEED certification to a rating of 94 in 2009. The building reflects an ENERGY STAR rating of 96 in 2009, showing even further improvement. The following comments summarize some of the key issues discussed in this case study:

- The 200 Market Place building leads its competition in tenant occupancy statistics with a current occupancy of 99.6%. While this high level of occupancy is most likely the result of a variety of factors, it is indisputable that the building is marketed and run as a high performance green property.

- Based on comparisons of the lease rates achieved, tenant improvement allowances offered, and escalation factors, the leases signed at 200 Market Place are similar to and competitive with those signed at comparable properties in the Portland central business district.

- From 2007 to 2008, operating expenses declined by 0.64%; they are projected to decline by an additional 3.29% in 2009.

- Energy consumption escalated each year from 2004 through 2006; however, since the building’s LEED certification in 2006 and implementation of a variety of energy strategies, energy use declined in 2007 by 3.45% and in 2008 by 8.73%, reflecting increasing year-over-year reductions. The most effective means an owner has
of counteracting rising and unpredictable energy costs is to reduce consumption. By aggressively implementing energy efficiency strategies, the building owner has ensured this expense will be kept to the lowest possible level, thereby mitigating the risk relative to this expense.

- By consistently looking for ways to improve overall building performance, the building owners are reducing the risk of early market obsolescence for the property and ensuring that 200 Market Place will remain a major competitor in the Portland office market for as long as possible.

- According to discussions with the head green building consultant for the property, Elaine Aye, 200 Market Place has successfully created what is widely recognized in the development and real estate industries as a sense of place. Tenants socialize there; they enjoy participating in the various activities and events that the property and different tenant groups offer. This factor may also contribute to the high occupancy experienced by 200 Market Place.

**DEVELOPER**

Russell Development Company was founded in 1979 by John Russell. It is a privately held development company based in Portland, Oregon. Russell Development Company owns a number of office buildings in downtown Portland and its commitment to sustainable green development principles and practices is well known. This commitment is clearly documented in the strategies implemented in 200 Market Place by Russell and his staff.

**PROJECT DESCRIPTION**

The 200 Market Place building is a 383,358 square-foot mixed-use development situated on 1.86 acres. The building has 324,819 square feet of net rentable office area on floors 2 through 19, and 50,356 square feet of net rentable retail space on the plaza and first floors. The building has three levels of parking (one ground level and two subterranean levels) with 554 parking stalls, or 1.44 parking stalls per 1,000 square feet of net rentable area. The 200 Market Place building was built in 1973 and completely renovated in 1990.

Russell Development purchased the building in 1988. A $25 million renovation plan included asbestos removal and the reconstruction of the building’s interior and the exterior of the ground level. The HVAC, ceiling, lighting, electrical distribution, data/telephone distribution, and life safety systems were all replaced in the 1990 renovation.

Since completion of the renovation, the building has undergone regular improvements and achieved LEED Gold for Existing Buildings (LEED-EB) certification by the U.S. Green Building Council in 2006. Since certification, the building owner has continued to improve building efficiency, as evidenced by the building’s ENERGY STAR rating, which increased from 79 at the time of LEED certification to a rating of 94 in 2008. The building currently reflects an ENERGY STAR rating of 96, showing even further improvement.

**RATIONALE/BUSINESS CASE**

When John Russell purchased 200 Market Place in 1988, he recognized that competition for tenants in the Portland central business district would be stiff. The building was 15 years old at the time and Russell was astute enough about real estate markets to realize that the building would need a real point of difference to meet his company’s investment and performance goals.

Basing his overall marketing and development plans for the building on the concept that high performance green building could create a point of difference that was not shared by any other multitenant building in Portland, Russell began a program toward greater sustainability for 200 Market Place that continues to this day.

His ultimate goals of continued improvement in building performance and tenant satisfaction reflect the principles and practices put forth by the LEED rating system.

Within the U.S. commercial real estate market, LEED is the most widely accepted national and international rating system for ranking commercial buildings on the basis of energy and environmental performance. Russell’s recognition of the benefits of, and investment in, these practices has successfully set his company and his investments apart.

**LEED-EB CERTIFICATION – 200 MARKET BUILDING**

The LEED-EB certification process for 200 Market Place was managed by Elaine Aye, a senior consultant with Green Building Services in Portland. She assembled a project team to complete the tasks required for LEED-EB certification. The team included the property manager, building engineer, maintenance staff, solid waste specialist, landscaping and electrical contractors, and the building commissioning agent.

Their collaboration produced a number of options that 200 Market Place could implement to achieve points for LEED certification. A variety of energy-saving techniques were identified and implemented. The team determined that the building could save a significant amount of water with a few modifications to existing systems. A new janitorial company was hired that used cleaning and maintenance products meeting the LEED-EB requirements.

The following section discusses some of the key initiatives completed to achieve the building’s LEED-EB Gold certification.
process identified several steps to improve energy efficiency and subsequently certification.

Some of the more significant energy projects that have occurred since 2009 include:

1. LEED Certification: In 2009, 9/20 Market Place achieved LEED certification.
2. Photovoltaic System: The building installed a photovoltaic system to generate electricity.
3. Energy Management System: The building implemented an energy management system to reduce energy consumption.

In summary, the 200 Market Place building has made significant progress in improving energy efficiency and reducing environmental impact.
Materials & Resources

The Portland Place building project achieved Environmental Services Revitalization Program (ESRP) status for the project's energy conservation efforts. The project's green design and construction efforts were recognized by the US Green Building Council (USGBC) with a Leadership in Energy and Environmental Design (LEED) Gold certification.

According to the Portland Place design team, the building's green features include:
- High-performance windows and glazing
- Energy-efficient lighting
- Water-efficient fixtures and appliances
- Sustainable materials
- Energy-efficient HVAC systems
- Greywater recycling
- Pedestrian-friendly streets
- Bicycle storage and parking
- Green roofs and green walls
- Increased natural light

FINDINGS AND VALUATION ASPECTS

Valuation/Analyses of the building's green features included:
- Increased energy efficiency
- Reduced greenhouse gas emissions
- Improved indoor environmental quality
- Enhanced building performance

The building's green features were estimated to have a positive impact on the building's market value, with a potential increase of up to 20% compared to similar non-green buildings.

Chart 1: Water Usage & Cost Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Usage (gallons)</th>
<th>Cost ($/gallon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>8,207,076</td>
<td>$6.412</td>
</tr>
<tr>
<td>2005</td>
<td>9,207,076</td>
<td>$6.359</td>
</tr>
<tr>
<td>2006</td>
<td>7,927,072</td>
<td>$6.563</td>
</tr>
<tr>
<td>2007</td>
<td>7,927,072</td>
<td>$6.192</td>
</tr>
</tbody>
</table>

Sources: Portland Place Real Estate Services, Inc.
Water Efficiency

It is clear from the savings reported in water usage that the steps taken to improve water efficiency at 200 Market Place were particularly important. This is especially true because of the high number of building residents who have been trained to use water efficiently. The benefits of these efforts can be seen not only in reduced water usage but also in increased energy efficiency.

Green Lease Clauses

It is also worth noting that in the leasing process, the tenants of 200 Market Place have been encouraged to participate in the green lease program. This has led to a significant reduction in energy costs, which has resulted in increased profits for the building owner.

Sustainable Sites

A large part of its success in achieving LEED certification is due to the high-quality, sustainable materials and features used in the construction process. These include recycled building materials, energy-efficient equipment, and sustainable construction practices.

High Performance Green Building

As a result of this focus on sustainability, an appraiser must consider the value of these features when valuing the property. The appraiser must consider the potential increase in the value of the building due to its sustainable features. This increase in value can be substantial, especially in today's market, where sustainability is becoming an increasingly important factor in the valuation of real estate.
The topic of indoor environmental quality (IEQ) has received increasing attention and importance as the move toward energy efficiency and high performance green building continues. This is likely as a result of several factors, including growing stakeholder interest and awareness, increasing building performance data, and the increasing availability of tools and resources to support and enable indoor environmental quality programs.

Many building owners commit to using recycled materials and reduce waste from tenant improvement projects. However, 200 Market Place has gone well beyond its conventional commitment and recycling tenants.

The savings flow to the tenants. This led to their success in a variety of alternative, low impact environmental materials. More interesting from a business and investment perspective was the significant headway made in reducing tenant recycling programs.

The payback of this factor is obvious when viewed from the perspective of discussions with a LEED consultant, Elaine Aye. Aye, 200 Market Place's LEED consultant, said that she has successfully created an improvement in the development and real estate industries as a whole. The various activities and events that the property and tenants groups offer are reflected in both cash flow assumptions and estimates of market value.

Through a growing number of studies support the improved value of better IEQ results, few cases have documented the actual price premium that this factor has on the investment. What is most important in this context is how owner-occupied commercial properties can be translated into enhanced tenant retention, then into quantifiable impacts that are reflected in both cash flow assumptions and estimates of market value.

Given the slow but continued introduction of newer buildings into the market, the fact that 200 Market Place continues to exhibit high levels of tenant occupancy and satisfaction is a positive addition to its share price, which is a prime rate after the properties enter the market.

With the slow but continued introduction of newer buildings into the market, the fact that 200 Market Place continues to exhibit high levels of tenant occupancy and satisfaction is a positive addition to its share price, which is a prime rate after the properties enter the market.

With the slow but continued introduction of newer buildings into the market, the fact that 200 Market Place continues to exhibit high levels of tenant occupancy and satisfaction is a positive addition to its share price, which is a prime rate after the properties enter the market.
from increased worker productivity flow through to the property and therefore affect asset value. This fact determines whether worker productivity has any impact on the market value of the asset.

Innovation & Design Process

Two-hundred Market Place was also awarded five points in the Innovations in Upgrade, Operations and Maintenance category. Points achieved included the following items:

- Innovation in Upgrade, Operations and Maintenance Credit 1.1 – Green Education
- Exemplary Performance in WE Credit 3, Water Use Reduction
- Exemplary Performance in MR Credit 1, Construction, Demolition and Renovation Waste Management
- Exemplary Performance in MR Credit 5, Occupant Recycling
- Innovation in Upgrade, Operations and Maintenance Credit 1.2 – LEED AP

It is worth noting that the majority of the points awarded were for exemplary performance in a given area.

Market Evidence and/or Empirical Data

As noted in the introduction to the case studies, market participants interested in investing in, underwriting, or valuing high performance green properties are faced with significant challenges when it comes to documenting sale prices, capitalization rates, rental rates, or rates of return; comparing operating expenses; or determining accurate cost projections for this type of property. Owners who are privy to this type of information, which they typically receive from their own portfolios of assets, generally consider it proprietary and use it for their own internal analyses. Many believe that it gives them an advantage over other market participants and in the instance of high performance green real estate, this may be true.

Unfortunately for the rest of the market, this precludes the broader marketplace from gaining the insights needed to make prudent business and investment decisions. In the case of 200 Market Place, the authors of this case study were given access to certain lease and operational specifics and were therefore able to analyze and share findings. Though the lease specifics of 200 Market Place are referred to in more aggregate terms, the authors do have the benefit of confirmed data that is retained in confidential files.

As noted in prior comments about estimating market value, valuers, investors, and underwriters compare the property being assessed to a group of peers considered comparable in the market place. A listing of several buildings considered competitive to 200 Market Place and the details of a representative sampling of leases from those properties are shown in Chart 2.

![Chart 2. Buildings considered competitive to 200 Market Place.](image)

The lease details summarized in Chart 2 are from downtown central business district office buildings considered direct competition to 200 Market Place. The leases were signed at the time of and following 200 Market Place’s LEED certification.

Based on comparisons of the lease rates achieved, tenant improvement allowances offered, and escalation factors, the leases signed at 200 Market Place are similar to and competitive with those signed at the comparable properties.

Information in the CoStar database was also reviewed to ascertain asking rents in and around the time of 200 Market Place’s certification. While asking rents are not signed leases, they typically provide an indication of the high end of achievable rates. Chart 3 reflects the Portland central business district submarket in the years cited.

![Chart 3. Average asking lease rates for Class A office properties.](image)

It should be noted that the information within the author’s files about leases signed at 200 Market Place from 2005 to 2007 indicate rent levels either met or exceeded the rents presented in Chart 3. Therefore, while one cannot claim that 200 Market Place receives a lease rate premium for being a high performance green building, rental rates at 200 Market Place can be characterized as top of the market and competitive with its peers.
Energy Expenses

Given the current focus on energy costs and related environmental issues, growing emphasis is placed on the energy performance of a property. As the data in Chart 4 reflects, owners and investors have no control over the costs of energy. However, they can work toward reducing consumption and improving energy efficiency. A proactive approach toward energy efficiency is one of the most prudent steps an owner can take in mitigating the environmental risks associated with fluctuations in the availability and costs of fossil fuels.

Chart 4 shows energy consumption at 200 Market Place from 2004 through 2008. The building achieved LEED-EB Gold Certification in 2006. Chart 4 presents a documented record of the positive results achieved since LEED certification of the building and since implementation of the various energy strategies previously discussed. Energy consumption increased from 2004 through 2006 and then decreased from 2007 and 2008.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>N/A</td>
<td>N/A</td>
<td>444,000</td>
<td>450,000</td>
<td>402,000</td>
<td>411,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>N/A</td>
<td>N/A</td>
<td>717,000</td>
<td>624,000</td>
<td>570,000</td>
<td>429,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>N/A</td>
<td>N/A</td>
<td>521,750</td>
<td>503,750</td>
<td>459,750</td>
<td>420,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Total</td>
<td>5,604,000</td>
<td>5,757,000</td>
<td>6,261,000</td>
<td>6,045,000</td>
<td>5,517,000</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Annual Change</td>
<td>N/A</td>
<td>2.73%</td>
<td>8.75%</td>
<td>-3.65%</td>
<td>-8.73%</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Cushman & Wakefield, Russell Development Company

Chart 5 shows the total energy costs for the property during the same time frame. Based on the chart, no clear pattern of energy costs is evident. Many do not realize that energy is primarily sold via mass auctions to various entities and then resold to the public. The timing of the energy purchase, the amount of energy purchased, its source, and numerous other factors determine what the initial costs are.

<table>
<thead>
<tr>
<th></th>
<th>2004 Low</th>
<th>2005 Low</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009 YTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>N/A</td>
<td>N/A</td>
<td>$20,866</td>
<td>$22,188</td>
<td>$22,067</td>
<td>23,916</td>
</tr>
<tr>
<td>High</td>
<td>N/A</td>
<td>N/A</td>
<td>$32,436</td>
<td>$30,766</td>
<td>$30,173</td>
<td>24,324</td>
</tr>
<tr>
<td>Average</td>
<td>N/A</td>
<td>N/A</td>
<td>$24,511</td>
<td>$25,619</td>
<td>$24,701</td>
<td>24,120</td>
</tr>
<tr>
<td>Annual Total</td>
<td>$258,369</td>
<td>$263,352</td>
<td>$294,126</td>
<td>$307,428</td>
<td>$296,413</td>
<td>N/A</td>
</tr>
<tr>
<td>% Annual Change</td>
<td>N/A</td>
<td>11.69%</td>
<td>4.52%</td>
<td>4.52%</td>
<td>-3.58%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Source: Cushman & Wakefield, Russell Development Company

Whatever entity distributes the energy has its own formulation of costs to determine how much energy will cost for consumers. Trying to identify a pattern or trend in base, initial energy costs is extremely difficult, if not impossible. Analysts should research the historical behavior of retail costs to consumers and then make the best projections possible based on the unpredictability of this commodity.

The most effective means that an owner has of counteracting rising and unpredictable energy costs is to reduce consumption. By implementing energy efficiency strategies, an owner can ensure this expense will be kept to the lowest possible level, mitigating the relative risk. While 200 Market Place’s energy costs in increased after LEED-EB certification, this was due to the rising cost of energy, not to the building’s energy consumption, which actually decreased. If the building had not made the energy improvements it did make, its 2007 and 2008 energy costs would have been even higher than reflected in this table.

Operating Expenses

Operating expenses vary considerably depending on a variety of factors, such as building age, size, location, and physical characteristics. All of these factors have roles in the operating expense history of a building. Chart 6 shows actual operating expenses on a square foot basis for 200 Market Place for 2007 and 2008, as well as the amount projected for 2009.

Chart 6. Operating expenses for 200 Market Place

<table>
<thead>
<tr>
<th>Year</th>
<th>$/SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>$11.00</td>
</tr>
<tr>
<td>2008</td>
<td>$10.93</td>
</tr>
<tr>
<td>2009 [budget]</td>
<td>$10.57</td>
</tr>
</tbody>
</table>

Source: Cushman & Wakefield, Russell Development Company

The trend toward a decline in expenses is clear in Chart 6. From 2007 to 2008, operating expenses declined by 0.6% and they are projected to decline by an additional 3.2% in 2009.

While it should not be assumed that this decline will continue, this downward trend can be documented and explained. Actual building performance can serve as a basis for future projections, as opposed to having to rely on industry averages.

Chart 7 shows actual 2008 energy costs at 200 Market Place in comparison with other LEED-EB certified buildings and Building Owners and Managers Association (BOMA) averages. BOMA averages are often used as a primary benchmark in evaluating the expenses of properties that are being analyzed for investment purposes, or properties that are being underwritten or valued. It is clear from this chart that using industry averages as the basis to estimate future energy costs at 200 Market Place would unfairly penalize the property. To do so would inaccurately skew long-term energy projections, bottom line results, and potential returns.
Assumptions made relative to future energy performance should reflect the proven benefits of the various energy efficiency measures that 200 Market Place has already completed and any new strategies it may incorporate.

**Occupy Levels**

To further identify 200 Market Place’s position in the Portland central business district office market, the occupancy figures for this submarket provided by CoStar were reviewed. CoStar is an informational database that is widely used in the commercial real estate markets. The CoStar occupancy data are shown in Chart 8.

**Chart 8. Portland Central Business District CoStar occupancy data.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>92%</td>
</tr>
<tr>
<td>2006</td>
<td>94%</td>
</tr>
<tr>
<td>2007</td>
<td>95%</td>
</tr>
<tr>
<td>2008</td>
<td>95%</td>
</tr>
</tbody>
</table>

Source: Cushman & Wakefield, Russell Development Company

Current occupancy rates at buildings considered most competitive with 200 Market Place were also researched and are summarized in Chart 9.

**Chart 9. Occupancy of competitive properties.**

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Year Built/Renovated</th>
<th>Green Features</th>
<th>Occupancy (1Q 2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200 Market Building</td>
<td>1973/1993</td>
<td>LEED-EB Gold 2006</td>
<td>98%</td>
</tr>
<tr>
<td>KOIN Center</td>
<td>1984</td>
<td>None</td>
<td>91%</td>
</tr>
<tr>
<td>Wells Fargo Tower</td>
<td>1972</td>
<td>None</td>
<td>95%</td>
</tr>
<tr>
<td>One Main Place</td>
<td>1980</td>
<td>None</td>
<td>95%</td>
</tr>
</tbody>
</table>

Source: Cushman & Wakefield, Russell Development Company

As evidenced by the information presented in Chart 9 (and confirmed by the research conducted for this study), 200 Market Place leads the competition in tenant occupancy statistics. While this high level of occupancy is most likely the result of a variety of factors, it is undisputable that the building is marketed and run as a high performance green property. This is clearly the focus of the owner and property management, and the success of the various tenant programs related to green initiatives would also suggest that the tenants believe in these strategies as well.

Given the consistently high levels of operational performance and tenant occupancy at 200 Market Place, and considering the ongoing maintenance programs to minimize water and utility costs while maximizing building performance, the question arises as to whether 200 Market Place should be considered a less risky investment than some of its peers.

This is the question that many investors are asking today about buildings that successfully implement high performance green strategies. Do these strategies offer buildings a competitive edge? Will energy efficiency initiatives reduce environmental risk? More hard data, which will become available as more of these buildings are built and occupied, will help answer these questions definitively. However, it appears that operating as a high performance green building has proven a successful strategy for 200 Market Place.

**CONCLUSION**

John Russell referred to the decision that he made years ago to “go green” and create a point of difference for his property as intuitive. Today, many would more aptly characterize that decision as astute. Two-hundred Market Place remains one of Portland’s most successful central business district office buildings. Since its certification as the first LEED-EB Gold multitenant office building in the United States, 200 Market Place has continued to enjoy its position in the Portland market as a leader in high performance design.
EXECUTIVE SUMMARY

In 2001, Great West Life Realty Advisors (GWRLRA), purchased the 24-storey, 275,624 square foot Centre in Vancouver’s 650 West Georgia Street office building. GWRLRA’s goal was to implement an energy conservation program to maximize energy efficiency and productivity, and to reduce operating costs and expenses. In addition, the energy retrofit project was viewed as a marketing tool to improve the property’s value.

The energy retrofit project returned a 10% return on investment and a 32% reduction in energy consumption. The project involved removing all incandescent and halogen lighting and replacing them with energy-efficient lighting. The project also included the installation of high performance glass, new windows, and the installation of new mechanical systems.

In discussing the various upgrades and high performance green features, Russell notes that small changes result in significant performance gains and tenant satisfaction. The 200 Market Place building will continue to be a benchmark for high performance green buildings. Russell believes that there is a growing market perception that incorporation of high performance green building principles is critical to enhanced marketability and increased tenant retention.

Russell believes that a LEED certification is a valuable asset and adds significant market value to exiting buildings. However, the benefits of LEED certification are not always directly related to enhanced marketability and increased tenant retention. The benefits of LEED certification are largely related to enhanced tenant satisfaction and reduced operating costs.

The way in which sustainable attributes translate into value is not simple to discern. In certain cases, the value of a LEED certified building is not clearly reflected in the purchase price of the building. However, the benefits of LEED certification are often reflected in increased tenant retention rates and reduced operating costs.

The study also concludes that the development and implementation of sustainable practices are important for achieving long-term success. The benefits of sustainable practices are largely related to enhanced tenant satisfaction and reduced operating costs.

For the purpose of this case study, John Russell, the owner and president of Russell Development Company, was interviewed. Russell Development Company is one of the first LEED certified companies in Canada and has set a goal to achieve LEED EB Platinum certification in all of its new buildings.

The final conclusion of the study is that value is not easily transferred to the market. However, the benefits of sustainable practices are largely related to enhanced tenant satisfaction and reduced operating costs. The study concludes that the development and implementation of sustainable practices are important for achieving long-term success.
between savings, cost, and value, illustrating how these are reflected differently in valuation methods. This resulted in possible confusion about how sustainable attributes affect asset value.

- An incidental finding relates to lease structures and how the relationship between landlord and tenant might be structured to support a sustainable retrofit for mutual profit. It was identified that the same attributes that gave a 19% approximate return on investment (ROI) could increase to 197% provided both parties agree to a lease term and structure more closely matching life cycle of the retrofit costs and savings; a redistribution of costs aligned with debt retirement; a reallocation of total occupancy payments (e.g., rent, operations, and maintenance costs), without raising the tenants’ total costs; and an apportionment of benefits. If handled carefully, this has the potential to encourage more retrofits by motivating landlords and tenants through mutual profit.

### Project Highlights

- **19% ROI, pointing to the potential for a 197% ROI**
- **C$235,000 annual projected savings**
- **Approximate C$2.5m 16-month project**
- **2,800,000 kWh annual electrical savings**
- **8,400 GJ annual fuel savings**
- **366 tons CO₂ avoided annually**
- **20% energy savings**
- **31% reduction in steam-related GHGs**
- **21% reduction in potable water consumption**

### Project Description

Predominantly an office building that was originally built for the Bank of Nova Scotia in 1977, the ground floor and sub-ground area of the Vancouver Centre are comprised of retail and associated space. Prior to purchase, GWLRA identified age-related obsolescence in certain equipment and the potential to improve energy efficiency with resultant savings. A rolling renovation program was implemented to optimize revenue flow and respect existing tenancies, which was completed in May 2004.

The approximately C$2.5m retrofit project included new integrated Heating Ventilation and Air Conditioning (HVAC) systems comprised of a variable volume chiller water system, new cooling tower, condenser and chilled water pumps, and variable speed drives for all floor fans. A key driver was the elimination of the ozone depleting CFC refrigerant R11 in the chilled water system. There was also an upgrade of all previous generation Direct Digital Control (DDC) HVAC controls to current technology for improved performance.

The upgrade also included a lighting retrofit (high-efficiency lighting and new control system) and improvements to the building’s network backbone to allow high speed network communication access among all floors and service areas. This communications upgrade provided an opportunity for the integration of building system controls and the growth of computer control opportunities, including HVAC, lighting, security, and fire alarm.

A more sophisticated energy monitoring and management system was installed, allowing for superior management of energy consumption and tenant comfort. By mid-2007, cumulative savings were 11.0 MWh, equaling to total savings claimed of C$1,000,000.

Subsequently, new tenants were signed with a higher energy load. The savings would have been lower with the prior tenant profile.

In part to spread costs and minimise tenant disruption, the project was implemented in a planned manner, during which it was identified that heat could be extracted from waste water. *Scavenger* systems were installed to recapture heat from rejected steam.

The project predates the establishment of the Canada Green Building Council but considered many of the energy reduction principles that are now considered within LEED® standards. Other sustainable attributes captured by LEED were not primary considerations of the retrofit, but incidental improvements were obtained, mainly in water reduction. The project was not submitted under a rating system prior to the retrofit, but was later certified under BOMA Go Green and earned ASHRAE BC Chapter’s 2006 Technology Award and a BC Hydro Power Smart Award.

Since the project was implemented, greater understanding of sustainability and associated abilities to improve energy capture and other items have been conceptualised. The project engineer and building manager advise that further improvements could now be achieved.

### Rationale/Business Case

As noted by Prism Engineering Ltd., who identified the innovation potential, managed the project, and tracked the expenditures and savings,

*By the end of 2007, GWLRA Realty Advisors had saved over 12.7 million kWh of electricity and almost 29 million pounds (43,000 GJ) of steam, for a total cost savings of 1.2 million dollars. They are currently benefiting from a 20% reduction in their electricity use and a 31% reduction in their steam use compared to the base period.*

The business case for the acquisition of the building included consideration of the financial impact from renovation of a major plant that was nearing the end of its life cycle. While this may have been a distraction to some investors, it attracted the purchasers, who have experience in optimising investment in come through renovation projects.
and a commitment to sustainability, GWLRA has experience in managing such projects while minimising disturbance for the tenants who remain in place.

They realised that the cash flow could be improved by upgrading older, less efficient plants. Project engineer Prism Engineering, working with GWLRA in pre-acquisition due diligence, projected an approximate four year payback. Prism also noted that the project could begin without moving existing tenants because work could begin in vacated spaces and core areas. The primary project focus was reducing energy demand and cost, although it was realised that there would be other benefits.

The original concept was to further upgrade tenant areas, completing a process that was started by the prior owners in the 1990s. By improving energy efficiency, the owners hoped to achieve savings that would add to the attraction of the 25-year-old building, improve occupancy rates, and increase tenant retention and associated inducements, all factors that would potentially benefit net income. Leases in the building at the time of the project and subsequently are represented as being consistent with most in the Vancouver downtown office market (i.e., predominantly triple-net with recovery of most landlord’s operating costs from the tenant).

At the time of first retrofit in 2002, the integrated nature of the project was innovative. Working for an owner that understood the benefits of sustainability, the project engineer was able to take a holistic approach to the design of the upgrade and identify energy-saving synergies across various components. The variable speed chilled water system operating with two-way valves was the first of its kind in Vancouver. The success of the first phase of the project fostered a culture for exploring further energy-saving opportunities and set the project team on a path of continuous improvement.

Interviews with GWLRA personnel identified that prior to acquisition of the building, there had been no expectation of direct impact on asset value from the savings. It was concluded that the purchase price had been adjusted to reflect plant upgrade costs, but not the value of savings. While this is in line with a common market perspective that operational savings do not directly translate to improvement in value, it runs contrary to the widely held belief amongst many in the high performance green building industry that savings have a direct relationship to asset value. This concept is explored in Findings.

### KEY GREEN FEATURES

#### Site & Location
- The Vancouver Centre is situated in an urban area with a high development density that is near existing infrastructure, reducing requirements for new infrastructure.
- The Vancouver Centre is located on Granville, Georgia, and Seymour streets, all of which comprise major bus routes serving the downtown core. The building is also opposite the main access to the existing Skytrain, a light rapid transit system. A new line to Vancouver International Airport is expected to open and one of the stations can be accessed from the Vancouver Centre. Close access to public transportation reduces land development impacts from automobile use. Greater access to public transportation allows convenient transport to and from work for employees, visitors, and clients.

#### Water Efficiency
- Water use was reduced and although the savings vary during the year, a reported 6,468 cubic feet, 183,153 litres, [21%] had been saved in 2006, which is equal to approximately C$16,000.
- Based on information gathered in the interview, there exists the potential for further savings by implementing a more aggressive water recycling policy. The net financial benefit of this is likely to be small however, which is a result of low water pricing in Vancouver.

#### Energy & Atmosphere
- The primary aspects of the project were energy related. Replacement of fixed volume heating and cooling systems with variable flow management and variable speed drives for all floor fans improved the ability to control localised conditions within the building. This resulted in improved occupant comfort.
- Chillers of identical capacity were replaced with two of differential capacity, allowing phasing of air conditioning to match loads and resulting in consequent benefit in reduced operating costs.
- Key to securing reductions was the installation of an energy management system with detailed monitoring of localised tenant needs. This allowed for automated adjustment of heat and cooling to specific locations.
- Heat scavenging was implemented to recover residual energy from high-temperature heat that was released by the central heat system.
- Improvements in CO₂ emissions reduction were consequential but not part of the business plan. This was because reducing CO₂ emissions were not regulated or incentivised when the project was conceived. This impact is commented on in the Findings section.
Materials & Resources

- Recycling of materials during the upgrade was not a deliberate policy; however, some materials would have been recycled by the city since drywall has been banned from landfills in Vancouver since 1990 and corrugated cardboard has been banned since 1997.
- Any remaining value from recycling the replaced plant was not considered since the plant was at the end of its useful life.

Indoor Environmental Quality

- No works were undertaken that materially impacted breathable atmosphere, such as use of low volatile organic compound materials.

FINDINGS

Interviews were conducted with the engineering advisor, senior executive for the owners, and the building manager. The manager had been managing the building since its development in the 1970s and transitioned from the prior ownership. The engineer’s summary was reviewed and evaluated, and discussions were held to confirm specific aspects.

It was concluded that the project demonstrates a successful use of sustainable practices to improve financial performance. Publicity and presentation materials reported various benefits, including over 20% ROI, but the author of this report references a claim of a 19% ROI. The calculations included in Chart 1 were within a reasonable margin of this number, which is accepted at face value.

Although simple payback of four years was claimed, the findings of this study could not substantiate this. Simple (internal) payback is a loosely-used term that provides a general indicator but that also has limitations in investment analysis because it is affected by how the project is financed. It was concluded that the payback took longer in this instance because the project was extended to ensure tenant disturbance was minimised.

Appraisers reflect how purchasers value buildings in the market. This means that in sophisticated markets, a complex approach might be used to determine value, but in other simpler markets, a simpler method might be used. A 472,422 sq ft building in New York or London would likely be valued differently from a similar sized building located in Vancouver or another smaller city. This is also apparent in the varying values of prime location, premium quality office buildings compared to low-quality decentralised offices in the same city.

In short, appraisers reflect the market and thus determine value by using approaches that reflect market practice. However, these methods may not adequately reveal a sustainable attribute’s value in the context of a building simply because the market does not use them.

This is not necessarily an appraisal failure, but one created by markets. The largest impact on how sustainable attributes are valued is the market itself. The market may either be unwilling to pay more for sustainable features, or unaware or uninterested about their benefits. Conversely, the market may be fully aware of sustainable attributes but unwilling to pay for them, and thus a buyer may be able to negotiate a purchase without having to pay for the full value of the savings. The latter is considered the case with the Vancouver Centre. This situation often results from a variety of factors, including good management and the bargaining positions of the parties.

The buyer used a detailed discounted cash flow (DCF) approach to assess value, which adjusted for projected long-term operating costs, including sustainable attributes. The buyer represents that the retrofit was largely triggered by expended life cycle of the major plant rather than a deliberate review of the building’s performance, and that they used the DCF to assess the impact on profit and cash flow. It is possible that the retrofit and its sustainable attributes might not otherwise have been considered without the plant being near the end of its life cycle.

Following an interview with the buyer, it was determined that the purchase price did not reflect the savings or the capital value of the savings from the upgrades. The purchase price was reduced by the cost of the upgrades. Therefore, it is important to determine how sustainable attributes impact savings, capital value, and cost. Another important factor is determining the lessons that can be learned regarding broader sustainability and risk, and whether the approach might now be different.
Appraisal Discussion

It is sometimes stated that energy savings have a direct relationship to building value. Some believe that this is achieved by multiplying the annual savings by the capitalisation rate, but this cannot be assumed. The following two points are examples of this:

• “...If the cap rate is 7%, divide the reduction in annual operating costs by 7% to calculate the increase in the building’s asset value.”

• “As the largest single operating expense in typical commercial buildings, energy costs are typically an important factor in building value.”

Each of these statements depends on there being a more or less direct relationship between savings and investment value, costs and lease terms. However, this relationship is not linear and due to differences in the nature of lease and bargaining position and power of the parties, cannot be certain. It did not happen at the Vancouver Centre.

• In a gross lease, the energy costs are usually paid by the landlord. In these circumstances, the tenant has no incentive to save energy, as illustrated in the Telergy study. The landlord will obtain any savings from investment in energy efficiency but have limited influence on whether the tenant is wasteful with energy. The benefit to asset value of a retrofit that improves performance is thus more direct than with a net lease, but it is an oversimplification to say that it can be multiplied by the capitalisation rate to determine asset value. This is because a buyer may regard energy savings as uncertain due to energy price fluctuations and because they are tenant-dependent. The buyer is thus likely to pay less than suggested by capitalising the energy savings value and, in a competitive market, retain the difference as profit.

• In a net lease, the tenant usually pays for sustainable investments and is also the beneficiary through reduced operating costs. However, these may not always flow back to the landlord and capital value, and can create disincentive if not carefully managed. This is because when a retrofit is undertaken, the costs are usually charged to the tenant over a short timescale, which increases the tenant’s total costs of occupation until the capital investment is repaid. At that point, operations and maintenance (O&M) charges decrease as a result of the sustainable retrofit’s benefits, and the tenant starts to benefit. But the benefit to the landlord is less clear.

• Landlords are usually driven by net income, so a benefit to the tenant needs to be translated into how it will benefit the investment cash flow to the landlord. Since the landlord is usually unable to raise the rent or claw back other benefits through improved cash flow until lease renewal or rent review, the benefit to the landlord can be deferred, sometimes substantially. At renewal or review, the lower O&M charges reduce the tenant’s occupancy charges, creating an opportunity to charge more rent without affecting total occupancy costs. Even then, the benefits might not flow directly to rent but are instead used to competitively position the building in the market by ensuring higher occupancy and reducing the tenant’s desire to leave. This affects internal churn, vacancy periods, and, possibly, tenant inducements. But the ability to attach the benefit of a sustainable retrofit to rent or capital value is at best indirect. A final twist is that even if the benefits of sustainability do raise capital value, this may result in higher property taxes.

In the Telergy case study, the buyer paid very little for the potential energy improvements. If the study is correctly understood, the amount paid in the eventual purchase price was equivalent to only about one year’s benefit.

These subtle differences in a building’s net cash flow are rarely shown or adjusted for in a direct comparison approach. They require a more detailed investment method to assess whether there is a net impact in capital value. It is thus not guaranteed that there will be a direct relationship between energy savings and asset value.

Hybrid combinations of the above are also possible, such as cost sharing arrangements driven by near-term tenancy expiries, a competitive marketplace, and other influences. In this case study, the positions of the vendor and purchaser also mattered:

• The buyer persuaded the seller to reflect the cost of the needed retrofit in the selling price;

• The seller did not bargain for its share of the savings that could be obtained from the retrofit.

Where sustainable improvements are charged to tenants as part of a retrofit of an existing building, the increased operating cost and disturbance to the tenants increases the potential for lease terminations or breaks. These factors impact landlords’ willingness to undertake such projects, and the savings or capitalised value associated with such projects is weighed against the risk to income flow.

Depending on the valuation approach used, appraisers and buyers may not assess the overall life cycle or calculate the impacts of reinvestment in more sustainable infrastructure. In Europe, this is known as marriage value: the bargaining to share benefits from the harmonisation of two interests. Often, the net benefits are shared between the parties: but in this case study, it seems that the vendor did not ask its share of this benefit, making it an incentive for the buyer to complete the considerably larger goal of purchasing the building.
this instance, according to the buyer and notwithstanding an internal project return on investment of about 19%, only the cost (not the benefit) was taken into account in the purchase price.

This is important because it illustrates that energy savings and resultant retrofit benefits were not the main drivers affecting the buyer’s decision. The buyer’s decision was influenced by the cost of the retrofit and the long-term advantageous position of the building’s total occupancy costs in the marketplace rather than savings or impact on capital value. While important, the use of a sophisticated investment appraisal is thus only part of the picture. A range of factors have to come together for sustainability to be thoroughly valued.

As a buyer, GWLRA appear to have considered the retrofit necessary to secure long-term investment value, while creating competitive positioning of the building in the marketplace. They expected this to translate to lower long-term churn, improved absorption on re-leasing, lower total occupancy costs benefitting marketing, and a lower building energy cost profile and thus more stable long-term cash flow certainty to investors. These value benefits are largely indirect.

Benefits from other aspects, such as savings in water, do not appear to have materially affected investment decisions or purchase price. Perhaps this is because water is currently inexpensive in British Columbia, although this is almost certain to change, driving focus towards greater conservation. The primary driver was clearly the financial performance of the asset, driven by return on investment with the risk-benefit of the works being a secondary (but considered) aspect.

In this instance, the difference between reduction in purchase price (equal to the cost of the retrofit) and the savings equalled profit, not capital value. It was a return on investment for GWLRA’s management expertise and the risk taken. Implicitly, the vendor may have realised this. Otherwise, it presumably would have sought a higher sale price. This raises another item: Whether value benefits from sustainable activities depends on the bargaining positions of the parties and the degree to which there is a competitive market.

In the subject instance, the buyer offset the cost by negotiating what it felt was a lower price. In an appraisal, this might be reflected by adjusting the initial, equated, or equivalent yield. Despite the project cost exceeding C$2.5m and the reported savings being greater, the differential between cost and savings in the context of the investment value of a 472,422 sq ft building is arguably so small it is difficult to distinguish.

This review therefore concludes that while the sustainable nature of the retrofit and savings were not pivotal in determining the value of the building to the buyer, the value of the retrofit was known and contributory. Illustrative evaluation [see Chart 1] shows that the retrofit may add approximately C$360,000 or 0.16% in net capital value benefit after debt service.

The retrofit is of appreciable size, but from the owner’s perspective, the savings are treated as 1) a return for the risk of tenant disturbance affecting investment cash flow, 2) a return for building management expertise in undertaking the works, and 3) a benefit to be used to attract and retain tenants.

In the long term, it might be possible for the savings to be reflected in lower operating costs and in some portion make their way into increased rents, higher occupancy and improved capital value. With a different lease arrangement, the savings might contribute more obviously and directly to value, which is considered in Green Lease. In other words, the way in which green attributes translate into value is not simple and is often indirect, and may alternatively be found in other factors (e.g., higher profit, increased staff productivity, or savings in tenant operating costs) rather than higher capital value.

As this study is not an audit, valuation, or appraisal, full assessment of the going-in yield or long-term impact on cash flow or value has not been undertaken and generic rates have been used.

Green Lease

This study identified that the lease structure affected who paid for sustainable attributes and who benefitted. This is the so-called green lease issue, in which differences of payment, benefit, and ownership result in questionable advantage to the owner in undertaking a retrofit.
The principle behind a green lease is to reduce the cost of energy consumption through the use of sustainable building materials and practices. This approach helps reduce the environmental impact of buildings and promotes the use of renewable energy sources. By addressing energy efficiency and sustainability in the early stages of building design and construction, homeowners and tenants can reap significant financial and environmental benefits.

**Broader Sustainable Impacts**

Several broad issues were identified in the analysis of the green lease market, including:

1. **Increased Property Value**: Properties with green features are often more expensive to build and maintain, but they also tend to attract higher rents and sell for a premium. This results in a higher return on investment for both landlords and tenants.

2. **Energy Efficiency**: Green leases encourage the use of energy-efficient technologies and practices, leading to lower utility bills and reduced greenhouse gas emissions.

3. **Health and Well-being**: Green buildings are designed to improve indoor air quality and provide access to natural light, which can have positive health impacts on occupants.

4. **Attractiveness to Tenants**: Tenants are increasingly looking for sustainable features in their homes and offices, making green leases an attractive option for landlords to attract and retain tenants.

5. **Government Incentives**: Many governments offer incentives to encourage the adoption of green leases, such as tax credits or rebates for energy-efficient improvements.

6. **Market Trends**: The trend toward sustainability in the real estate market is expected to continue, making green leases a smart investment in the long run.

**Affecting Value**

As noted in Chart 1, the value of green leases is determined by the cost savings realized from energy-efficient measures and the perceived value of the property due to its sustainability. These factors can significantly impact the overall value of the property, both in terms of rent and sale price. The analysis suggests that properties with green features can command a premium over non-sustainable alternatives.

**Conclusion**

In conclusion, green leases offer a win-win situation for both landlords and tenants. They provide a means to reduce energy costs, improve property value, and contribute to a more sustainable future. As the market for green leases continues to grow, it is likely that the benefits of this approach will become even more apparent.

---

24. The principle behind a green lease is to reduce the cost of energy consumption through the use of sustainable building materials and practices. This approach helps reduce the environmental impact of buildings and promotes the use of renewable energy sources. By addressing energy efficiency and sustainability in the early stages of building design and construction, homeowners and tenants can reap significant financial and environmental benefits.

25. Several broad issues were identified in the analysis of the green lease market, including:

1. **Increased Property Value**: Properties with green features are often more expensive to build and maintain, but they also tend to attract higher rents and sell for a premium. This results in a higher return on investment for both landlords and tenants.

2. **Energy Efficiency**: Green leases encourage the use of energy-efficient technologies and practices, leading to lower utility bills and reduced greenhouse gas emissions.

3. **Health and Well-being**: Green buildings are designed to improve indoor air quality and provide access to natural light, which can have positive health impacts on occupants.

4. **Attractiveness to Tenants**: Tenants are increasingly looking for sustainable features in their homes and offices, making green leases an attractive option for landlords to attract and retain tenants.

5. **Government Incentives**: Many governments offer incentives to encourage the adoption of green leases, such as tax credits or rebates for energy-efficient improvements.

6. **Market Trends**: The trend toward sustainability in the real estate market is expected to continue, making green leases a smart investment in the long run.

26. As noted in Chart 1, the value of green leases is determined by the cost savings realized from energy-efficient measures and the perceived value of the property due to its sustainability. These factors can significantly impact the overall value of the property, both in terms of rent and sale price. The analysis suggests that properties with green features can command a premium over non-sustainable alternatives.

27. In conclusion, green leases offer a win-win situation for both landlords and tenants. They provide a means to reduce energy costs, improve property value, and contribute to a more sustainable future. As the market for green leases continues to grow, it is likely that the benefits of this approach will become even more apparent.
understood to be one of the ten largest emitters in Vancouver. This will increase costs in the long term, albeit that district energy is generally a more efficient system for energy supply.

- After use, heat is scavenged using a simple system and the water is discharged to the sewer. The growing need to conserve water may change this, increasing the requirement to upgrade scavenging and reusing water. In other words, the financial system boundary is not yet sending sufficient price signals to encourage heightened performance in this area. Since some indicate that as little as 5% of a typical office building water use is used for drinking water, the potential for appreciable reduction in water consumption through an integrated resource management approach will be increasingly viable.

- The Vancouver Centre has single-glazing, which results in a low return on investment from re-cladding that might yield as much as 30-40% improvements in thermal efficiency due to the absence of carbon price signals and the low cost of energy. Because the current system boundary is arguably under-priced, initiatives such as these have yet to take effect but may do so once they start to impact investment cash flows. There are ways to address this issue through retrofit that within a more comprehensive business case and with the pressure of increased energy costs would make such a program more viable in the short term.

- Overall, the Vancouver Center is perhaps better placed to adapt to factors in climate change, which in the long term may improve the stability of its income and the resilience of the investment yield.

The typical appraisal currently takes little or no account of these factors because the market has yet to fully reflect this potential within prices or rents. However, there are some signs that this may change. First, government agencies are starting to include aspects beyond the system boundary, which is in turn affecting the private sector that rents buildings to government. Second, some private sector companies are starting to mirror government agencies by including these factors in their decisions. Third, some owners and pension funds are starting to change because they are concerned about the potential for sustainable attributes to impact demand, cost, or value in the future; this is the so-called precautionary principal. Fourth: there is increasing discussion of the introduction of building energy labels, which will make the total energy footprint more apparent to consumers, occupants and owners. These aspects of risk are only rarely considered in many appraisals, in part because clients are not commonly requiring them.

In the long term, it remains to be seen how much, how quickly, and when such factors will affect valuations. However, perhaps the more powerful argument for appraisers to consider these factors is that ignoring them may not reflect the highest and best use and value of a property.

There is increasing global discussion that the green economy in fact represents a financially superior return to standard economies and companies. There is also some statistical data and research supporting this claim.28 Thus, an aspect that can usefully be considered for many buildings is the possibility to use more advanced retrofit techniques, improving financial performance and asset value.

Appraisers who are knowledgeable about future potential changes and the ability of sustainable approaches to improve building performance may start to find that doing so in appraisals represents the highest and best use and value. Such conclusions would be more likely to be reflected using investment approaches to appraising value. For funds, as demonstrated in this example, an approach dedicated to improving performance is in fact one that can yield tangible improvement in cash flow and profit, if not actual capital value.

While achieving extra value from sustainable attributes may involve more innovative approaches to asset management, the use of advanced sustainable approaches is not necessarily complex. As governments move to increase price messaging (taxes and credits) to encourage sustainability, this will increasingly affect net value of existing assets and improve investment performance for buildings adapted or adaptable to these goals. It will also increasingly encourage owners to consider less traditional solutions to enhancing asset performance and value.


<table>
<thead>
<tr>
<th>Assumptions (Vancouver Centre - Class A office)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building size sq ft</td>
<td>472,422</td>
<td></td>
</tr>
<tr>
<td>Finance rate</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td>Green savings psf pa</td>
<td>$0.51 psfpa</td>
<td></td>
</tr>
<tr>
<td>Green savings total pa</td>
<td>$240,935 pa</td>
<td></td>
</tr>
<tr>
<td>Life cycle</td>
<td>12.00 yrs</td>
<td></td>
</tr>
<tr>
<td>Yield (Cap rate)</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Years Purchase (1/yield)</td>
<td>16.666666667</td>
<td></td>
</tr>
<tr>
<td>Energy retrofit costs psf</td>
<td>$4.32 psf</td>
<td></td>
</tr>
<tr>
<td>Energy retrofit costs</td>
<td>-$2,040,863</td>
<td></td>
</tr>
<tr>
<td>Rent [excluding utility costs] psf</td>
<td>-$29.00 psf</td>
<td></td>
</tr>
<tr>
<td>Rent paid to landlord</td>
<td>-$13,700,238 pa</td>
<td></td>
</tr>
<tr>
<td>Utility costs psf</td>
<td>-$2.61 psf</td>
<td></td>
</tr>
</tbody>
</table>

**Renovation**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Renovation capital costs</td>
<td>-$2,040,863 pa</td>
</tr>
<tr>
<td>Renovation finance over life cycle</td>
<td>-$219,296 pa</td>
</tr>
<tr>
<td>Renovation savings</td>
<td>$240,935 pm</td>
</tr>
<tr>
<td>Renovation profit [loss] psf</td>
<td>$21,639 pa</td>
</tr>
<tr>
<td>Traditional “simple payback” analysis</td>
<td>8.47 yrs</td>
</tr>
<tr>
<td>Maximum breakeven interest rate</td>
<td>7.38%</td>
</tr>
</tbody>
</table>

**Value Analysis**

<table>
<thead>
<tr>
<th>Tenant</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tenant's utility payments</td>
<td>-$1,233,021 pa</td>
<td>-$992,086 pm</td>
</tr>
<tr>
<td>Rental increase</td>
<td>-$240,935 pa</td>
<td></td>
</tr>
<tr>
<td>Tenant's total occupancy costs</td>
<td>-$14,933,259 pa</td>
<td>-$14,933,259 pa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Landlord</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Landlord's gross rent</td>
<td>$13,700,238 pa</td>
<td>$13,941,173 pa</td>
</tr>
<tr>
<td>Less: cost of finance</td>
<td>-$219,296 pa</td>
<td></td>
</tr>
<tr>
<td>Landlord's net rent</td>
<td>$13,700,238 pa</td>
<td>$13,721,877 pa</td>
</tr>
<tr>
<td>Landlord's increase in net income</td>
<td>$21,639 pa</td>
<td></td>
</tr>
<tr>
<td>Increase in capital value, after debt service</td>
<td>$360,647</td>
<td></td>
</tr>
<tr>
<td>Capitalised value after debt service</td>
<td>$228,337,300</td>
<td>$228,697,947</td>
</tr>
<tr>
<td>Retrofit value as % of building value</td>
<td>0.16%</td>
<td></td>
</tr>
</tbody>
</table>

**Profit**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital investment</td>
<td>-$2,040,863</td>
</tr>
<tr>
<td>Capitalised gross annual return on investment</td>
<td>$240,935 pa</td>
</tr>
<tr>
<td>Gross increase in capital value</td>
<td>$4,015,587</td>
</tr>
<tr>
<td>ROI before debt service</td>
<td>196.6%</td>
</tr>
<tr>
<td>Capitalised value after debt finance</td>
<td>$360,647</td>
</tr>
<tr>
<td>ROI after debt service</td>
<td>17.7%</td>
</tr>
</tbody>
</table>

**Notes:** Tax implications: impact of taxation on improvements ignored. Data supplied accepted at face value. See text for general notes on methodology. pa = per annum pm = per month psf = per square foot
THE PURPOSE OF THIS STUDY IS TO BRIDGE THE GAP IN UNDERSTANDING BETWEEN THE BUILDING/DESIGN COMMUNITY AND FINANCIAL/INVESTMENT COMMUNITY BY PROVIDING INFORMATION ABOUT THE VALUATION OF HIGH PERFORMANCE GREEN BUILDINGS.

This study was made possible by the generous support of the following funders: