



HIGH PERFORMANCE GREEN BUILDING: WHAT'S IT WORTH?

Investigating the Market Value of
High Performance Green Buildings



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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) 968-7160.

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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.

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- Valuation professionals, lenders, underwriters, owners, investors, and other members of the financial/investment community will better understand which high performance green building/sustainable strategies might impact asset value and market positioning of a building.

The authors of this paper are hopeful that readers will find this information helpful in understanding how the decision to move toward high performance green building practices may play a role in estimating the market value of a commercial property.

TERMINOLOGY – SUSTAINABILITY AND HIGH PERFORMANCE GREEN BUILDING

One of the greatest challenges in bridging the communication gap between the building/design community and the financial/investment community is the ability to successfully translate the concepts of one group to the other. For the purposes of this study, the building/design community includes architects, engineers, contractors, designers, and design and construction consultants. Real estate valuation professionals, appraisers, lenders, owners, developers, underwriters and other real estate financial professionals comprise the financial/investment community. In many instances, the challenge may be the ability to translate either a design or valuation concept to the public at large. The reader's indulgence is respectfully requested in this regard.

One of the terms most frequently misunderstood and misused is the word *sustainable*. In the building/design community, it has very specific environmental and ecological applications. Conversely, the financial/investment community (and the public), use it in a much broader context. In fact, in many real estate discussions, the terms *sustainable*, *green*, and *high performance* are used interchangeably when discussing buildings with green attributes.

Leaders of valuation groups from throughout North and Latin America, Europe, and various Pacific countries met in 2007 in Vancouver, BC, to discuss the valuation implications of sustainability and how they should be approached on a global basis. The result of that meeting was the Vancouver Valuation Accord, a document that was signed by representatives from 20 countries and that adopted the definition of sustainable development created for the United Nations by the Brundtland Commission in 1987:

...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The Brundtland Commission defined sustainable development using seven themes, which included the concept that environmental and social factors are given comparable consideration to the economic factors associated with real estate development.

While the authors understand that very few, if any, existing buildings currently meet the complete architectural and design criteria and requirements of truly

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sustainable development, there are references in the case studies to a building's sustainable attributes or performance. In these instances, the term is used for descriptive purposes, and reflects the owner's or investor's various approaches to improve building performance in all aspects. The use of this descriptive term is meant to characterize the types of initiatives undertaken by the building owner or investor to create a financially and environmentally healthier, more efficient building.

BACKGROUND

This project was the collaborative effort among private industry, government, and nonprofits that were all interested in answering one question: Are high performance green buildings really worth more than traditional buildings?

To explore this question, two of the leading experts in valuing high performance green properties in the United States and Canada (see Bios) were recruited to analyze and ascertain whether high performance green attributes contributed to market values. The consultants approached the owners of three high performance green commercial office buildings (200 Market Place in Portland, OR; Alley24 East in Seattle, WA; and the Vancouver Centre in Vancouver, British Columbia) who were willing to make their data available for analysis. The results of this work are three detailed case studies on green buildings written from a financial/investment perspective. The owners of the three subject properties gave the research team access to lease rates, operational expense data, and other

financial performance information that is rarely shared with outside observers. As a result, these analyses offer unprecedented information and strategies about the valuation of high performance green buildings.

CONSULTANTS/AUTHORS

Theddi Wright Chappell: Theddi Wright Chappell is the managing director of the Cushman & Wakefield of Washington Valuation Services, 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 business for over 20 years. She has extensive experience in national and international investment analysis and consulting services, having worked on projects throughout the United States, Canada, Europe, and Australasia. Theddi most recently served as the CEO of Sustainable Values, Inc. in Portland, Oregon, where she specialized in market, feasibility, and investment analysis particularly related to valuation and financing of new, existing, and urban redevelopment projects, as well as the identification and quantification of the benefits of sustainable development. Theddi serves as the ambassador of sustainable initiatives for the Appraisal Institute and is a director of the Green Building Finance Consortium. She was an organizer of and presenter at the Vancouver Valuation Summit in Vancouver, BC. She is a LEED Accredited Professional who graduated with honors from the University of Tennessee and holds the CRE, MAI, FRICS, and AAPI designations.

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Chris Corps: Chris Corps is a chartered surveyor and principal of Asset Strategies in Victoria, British Columbia. Chris instigated and co-led the Vancouver Valuation Accord and Summit, an initiative linking sustainability and value that was signed by BC's Premier and valuation professionals from 20 countries. Chris has nearly 30 years of experience in real estate and complex business cases in the UK and Canada. He specializes in investment and development viability, working on projects from London's Canary Wharf to Dockside Green. With a background in linking sustainability to value, Chris instigated and led the 2005 international Green Value study. He is vice president of Light House Sustainable Building Centre, an advisory board member of the Green Building Finance Consortium, and member of committees responsible for defining valuation standards used in 132 countries. Chris is the inaugural past chairman of Canada's Royal Institution of Chartered Surveyors and recently co-led an initiative that identified over \$1.7 billion in savings by linking value and sustainability. That initiative can result in 25% reduction of greenhouse gases while eliminating waste at no cost to taxpayers.

METHODOLOGY

The consultants took various steps including some or all of the following to complete the case studies:

- Conducted inspections of the properties being analyzed
- Completed primary and secondary market research

- Gathered information on the green strategies employed at the subject properties
- Interviewed building owners, managers, engineers, high performance green building consultants, and others associated with the implementation of green strategies
- Interviewed agents, brokers, and other market participants regarding the market positioning of the subject properties
- Compared property specific information to broader market parameters:
 - » Occupancy
 - » Rents
 - » Tenant profiles
 - » Tenant retention
- Analyzed the properties' performances relative to the following:
 - » Operational costs and savings
 - » Absorption and tenant retention
 - » Market competition
 - » Established goals
 - » Historical statistics
- Submitted assessments and conclusions for peer review including working analyses of payback and financial assessments.

The consultants for this study are valuation experts who specialize in assessing the asset value implications of green practices and principles. Both have practices that focus on maximizing the value of real estate investments and developments, especially through the adoption of high performance green strategies. Gathering market

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and property specific information and analyzing the costs and benefits of these strategies objectively and thoughtfully provides a basis for identifying and validating their valuation impacts.

SUMMARY OF KEY FINDINGS

The following sections present the key findings of the research conducted on the three subject properties. A more detailed analysis and supporting information can be found in the case studies that follow these summaries. It should be noted that the information presented in each of the studies is slightly different, which is typical in most real estate analyses. Consultants, investors, underwriters, and analysts are consistently faced with the disparity in data availability and must rely on the information that is available in each specific situation. In almost every instance, there will be variations in the amount and context of the information available, making comparisons among investment opportunities, underwriting possibilities, and valuation assignments a continual challenge. The case studies that follow are no different, offering similar yet varying information on each of the projects.

Project 1 – Alley24 East, Seattle, WA

Alley24 East was one of the first mixed-used developments in Seattle to achieve Leadership in Energy and Environmental Design (LEED®) certification from the U.S. Green Building Council (USGBC). The project achieved LEED for Core & Shell (LEED-CS) Silver certification

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). Following are some of the key findings from the case study:

- 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 has retained high quality tenants;
 - » achieved competitive rents;
 - » and has a higher-than-average level of occupancy.
- When the building was delivered, it was 90% preleased. This is an impressive amount of preleasing under any circumstances. Given the somewhat unproven location 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, as well as the owner's insights 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, at the same time exceeding industry averages for both rent and occupancy.

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**Project 2 – 200 Market Place,
Portland, OR**

Two-hundred Market Place was the first multitenant 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.

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- 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 81,155 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 continued 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, has grown tenfold since 2003.³

1 All US information from US Green Building Council - <http://www.usgbc.org> and all Canadian information Canada Green Building Council - <http://www.cagbc.org>

2 US Green Building Council - <http://www.usgbc.org>

3 Canada Green Building Council - <http://www.cagbc.org>

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 line⁴) 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

4 John Elkington, *Cannibals with Forks: The Triple Bottom Line of 21st Century Business* (Oxford: Capstone Publishing, 1999).

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.

Awareness of the considerations and constraints inherent in the valuation process will facilitate a better understanding of both the valuation process overall and, more specifically, the challenges that valuers face in evaluating and valuing high performance green properties.

Further, by creating a deeper comprehension of the methodology utilized to arrive at market value, the studies should contribute to a broader exchange of the types of data required to arrive at an accurate value estimate of high performance green development. If undertaken properly and accurately, valuation can be essential in understanding whether high performance green measures add value.

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 Surveyors⁷ and used by its members in 132 countries.
- Internationally, the International Valuation Standards administered by the International Valuation Standards Council⁸ sets an agreed upon standard that multiple countries subscribe to and that is increasingly used as the core global valuation standard.

⁵ The Appraisal Institute, *The Appraisal of Real Estate: Thirteenth Edition*, p. 16.

⁶ See <http://www.aicanna.ca/>.

⁷ See <http://www.rics.org/>.

⁸ See <http://www.ivsc.org/>.

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, knowledgeably, 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.

¹⁰ The Appraisal Institute, *The Appraisal of Real Estate: Thirteenth Edition*, pp. 44-46.

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

¹¹ The Appraisal Institute, *The Appraisal of Real Estate: Thirteenth Edition*, pp.141-143.

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? Commissioning¹³ could impact assumptions relative to the

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.

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.

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Resources

- www.vancouveraccord.org (access to additional case studies and other information)
- www.dsireusa.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)

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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



Alley24 East

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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 shares 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

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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

Address	221 Yale Avenue North
Net Building Area (Square Feet)	Office: 186,299 Retail: 24,557 Total: 210,856
Date Completed	February 2006
Owner	Vulcan Inc. / PEMCO Mutual Insurance Company
Developer	Vulcan Real Estate
Architect	NBBJ
Builder	Skanska USA
Construction Cost	\$42,000,000



Street-side retail view

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Alley24 East is composed of two mid-rise buildings with 24,557 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

¹⁴ See <http://www.vulcanrealestate.com/>.

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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.

¹⁵ USGBC LEED for Core & Shell Version 2.0 Rating System. See <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=295#v2.0>.

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- The project includes bicycle storage, showers, and changing rooms in the garage. The ability to ride a bicycle to work reduces pollution and other environmental and developmental impacts resulting from automobile use.
- The parking garage in Alley24 East includes several preferred parking stalls with electric vehicle charging capability. The garage also offers preferred monthly parking rates for tenants who drive an electric vehicle to work, with no charge for the use of the electric charging station.
- Alley24 East meets, but does not exceed, the minimum parking requirements mandated by current zoning. This both reduces the use of single occupancy vehicles and diminishes the level of vehicular pollution associated with the development.



Alley24 East seating area on the roof

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- The building's parking facilities are located underground, reducing the development's heat island effect. A further reduction to the potential heat island effect is achieved through the incorporation of rooftop gardens, which also serve to absorb storm water run-off.

Water Efficiency

Alley24 East achieved two points for water efficiency. Points were achieved for the following features:

- Water usage was reduced to 30% 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.

Energy & Atmosphere

Alley24 East'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. modeled electricity costs for Alley24 East, and demonstrated optimized energy performance and compliance with ASHRAE-90.1 1999 standards.
- The development process included enhanced commissioning that was conducted after the systems' performance verification was completed. It is important to note that building owners and managers often consider the commissioning process invaluable since it ensures optimum operational performance at building occupancy and often identifies areas where further cost savings are possible.
- The building uses refrigerants that minimize the emissions of compounds contributing to ozone depletion and climate change. A hybrid HVAC system offers tenants the option of natural ventilation through operable windows or energy efficient air conditioning. Operable windows and adjustable air diffusers in the raised floor allow tenants to control their environments without involving building management.
- In addition, building management provides ongoing accountability of energy consumption using meters that allow for the monitoring of 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 is shared with tenants with above average usage (such as call centers).
- According to NBI's building performance review, Alley24 East achieved an ENERGY STAR score of 97 as a result of its energy efficient systems, placing the building in the top 3% of the national building stock in terms of energy efficiency.¹⁶

Materials & Resources

Alley24 East achieved six points for materials and resources. The factors for which the points were awarded include the following factors:

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

¹⁶ New Buildings Institute, *Building Performance Review: Alley24 Building*, April 2008.

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- 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.

Indoor Environmental Quality

Indoor environmental quality (IEQ) has become an increasingly important factor in attracting and retaining tenants and employees. A number of different tenants in Alley24 East claimed that indoor environmental quality was one of the deciding factors in why they chose to lease space in a LEED certified building. Alley24 East achieved six points for indoor environmental quality. Strategies used to achieve points in this category included the following points:

- The building minimizes indoor air contaminants through the use of low-emitting materials, including paints, coatings, and carpeting. It also minimizes tenant exposure to potentially hazardous particulates and chemical pollutants by providing good air ventilation.
- Tenants are able to control their own environments through operable windows, energy efficient air conditioning, and adjustable air diffusers in the raised flooring. Discussions with building management indicate that this feature is instrumental in maintaining a high level of tenant satisfaction.
- The hybrid HVAC system was designed to provide a comfortable thermal environment for tenants while also reducing energy expenses.

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

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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 \$38 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.

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Chart 1. Development Costs for Alley24.

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/retail	\$38,007,000
Residential	\$19,704,000
Consultants	\$1,767,000
Furniture, fixtures and equipment	\$454,000
Utility relocation/lookup	\$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

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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

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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

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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



The east pedestrian entrance at Alley24 East.

¹⁷ New Buildings Institute, *Building Performance Review: Alley24 Building*, April 2008.

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of value for commercial real estate in the future. From a valuation perspective, building performance and especially energy performance will impact a building's competitive positioning in its market, its desirability to investors and tenants, and its market value.

Water Efficiency

The project achieved significant savings in water usage. While water is not overly expensive in the Northwest, it still bears a cost that impacts the net operating income (NOI) of a property and can therefore also impact property value. Of particular relevance to the trade off for any high performance green strategy or component is the identification of not only the costs but also the long-term benefits. Identifying and quantifying benefits over time, along with the commensurate return on investment (ROI), is imperative to an accurate estimate of value.

Materials & Resources

Twenty percent of the building materials used in Alley24 East were manufactured in the Northwest region. The use of proximate materials saves on transportation costs and can potentially benefit local and regional product providers. From a valuation perspective, this practice could be relevant if savings to the development are apparent or if the marketability of the project is enhanced.

There are a growing number of investors who have signed on to the United Nations' principles of responsible property investing (RPI). These signatories incorporate certain

factors in their investment criteria, including economics, environmental characteristics, security, and social considerations. One of the most prevalent social considerations is the assessment of workforce benefits derived from a given development. If a potential investment provides a competitive rate of return and can show that it benefited the regional workforce, it has added appeal to those groups that embrace RPI.

Increasingly, corporations, government entities, pension funds, and other responsible investors from around the world are adopting similar investment criteria. It is necessary for the valuation community to identify market behavior that could potentially impact market value. While it is too soon to determine whether principles of this nature will directly impact, and ostensibly drive, market behavior and value, valuers should identify and report the criteria upon which investment decisions are made and assess the extent to which this criteria could influence market value.

Indoor Environmental Quality

The innovations incorporated into Alley24 East relative to 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, it is imperative that tenants be educated about the differences between the systems in place and more traditional systems. Further, this educational process does not occur overnight: it is the result of continued communication with the tenants relative to proper and therefore maximum systems

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performance. This was and still is the case with Alley24 East.

Alley24 East uses a combination of operable windows and a hybrid HVAC system to achieve maximum energy efficiency and tenant comfort. Reaching an optimum balance of outdoor air and interior ventilation required collaboration between tenants and building management, something any owner incorporating new technologies or innovative practices should anticipate.

The element of control plays a major role in achieving tenant cooperation and satisfaction. Once tenants understand how to maximize their own comfort, studies have shown that their tolerance for temperature range is much greater. The end result is happier tenants, which will hopefully result in better tenant retention and less downtime between leases. This will also result in a more satisfied owner who will benefit from energy savings and an improved bottom line.

A Final Note on the LEED Process: Commissioning

It was noted in the study that Alley24 East received enhanced commissioning. It is the opinion of a growing number of valuers familiar with this process that this is a significant factor from both an investment and valuation perspective. 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. However, most investors, lenders, and

valuation professionals have little understanding either of the concept or relevance of commissioning as a standalone practice, as well as its role in the context of LEED certification. While the architectural and design communities are well versed in this procedure, the real estate world is not. From a risk and valuation perspective, this is perhaps one of the most important components of the 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 then be incorporated into a formal valuation or evaluation analysis. The information provided by the experts completing the commissioning process can be relied on not only for performance and expense projections, but also for assumptions relative to operational and performance risks. As with any provider of information upon which investment, lending, or valuation decisions are made, due diligence must be completed to establish the extent of the commissioning agent's experience, reputation, and expertise. Care must be taken in the level of weight put on projections and identification of variables, particularly those related to tenant behavior.

Investments are made, cap rates and value are decided, and market value is estimated on the basis

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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.

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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.

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

Source: Cushman & Wakefield

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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 (\$?) 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.

Year	Asking Rate (NNN equiv.)
2004	\$20.39
2005	\$20.92
1st half 2006	\$21.24
2nd half 2006	\$24.22
2007	\$27.36

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

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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.

Year	Space Leased	Space Available	Occupancy
Pre-Construction Period			
	85,000	100,000	45.95%
Construction			
	166,500	18,500	90.00%
Post-Construction			
	18,500	0	100%

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.

Year	Occupancy
2004	77.8%
2005	76.5%
1st half 2006	78.5%
2nd half 2006	93.00%
2007	91.50%
2008	89.10%

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.

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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

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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.

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200 MARKET PLACE
200 Market Street, Portland, Oregon, USA

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 2008. 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



200 Market Building, ©2007 Leo Ketel

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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.

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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.

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KEY HIGH PERFORMANCE GREEN FEATURES

As defined by the USGBC, the elements of green development that comprise the LEED rating system are identified in the following list with the number of points in each section of LEED-EB version 2.0 in parentheses:

- Sustainable Sites (14)
- Water Efficiency (5)
- Energy and Atmosphere (23)
- Materials and Resources (16)
- Indoor Environmental Quality (22)
- Innovation and Design (5)

To earn LEED-EB certification, the applicant project must satisfy all of the prerequisites and achieve a minimum number of points to attain the established LEED-EB certification. The following list details the number of points required to achieve different levels of LEED-CS certification.¹⁸

- Certified 32 - 39 points
- Silver 40 - 47 points
- Gold 48 - 63 points
- Platinum 64 - 85 points

The strategies that were employed at 200 Market Place to achieve points in each of the categories for LEED-EB Gold certification are discussed in the following paragraphs.

¹⁸ USGBC LEED for Core & Shell Version 2.0 Rating System. See <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=295#v2.0>.

Sustainable sites

The 200 Market Place building achieved a total of nine points in the Sustainable Sites category.

The property is located in downtown Portland, with convenient access to public transportation and other local amenities. Nearby transit facilities include bus, light rail, and the Portland Streetcar.

Its proximity to major transportation arteries and public transportation effectively eliminates the need for any additional public infrastructure to serve 200 Market Place. Developing a high density property such as 200 Market Place in an urban location preserves green fields, and protects habitat and natural resources.

The building's proximity to public transportation reduces pollution and land development impacts from automobile use. The building has bicycle racks with shower and changing facilities in the garage.

The building implemented a stormwater management plan, which reduced stormwater runoff by over 50%. Strategies employed included a green roof and rain capture. Reducing stormwater runoff is particularly important in Portland since runoff from the 200 Market Place site would flow directly into the Willamette River.

The 200 Market Place building reduced its urban heat island effect via underground parking, a vegetated roof area (also used for annual bocce ball tournaments by the tenants), and an ENERGY STAR compliant roof. The urban heat island effect occurs when

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urban air and surface temperatures are higher than nearby rural areas due to dark, non-reflective surfaces, the elimination of trees, and vegetation and other factors created by human development.

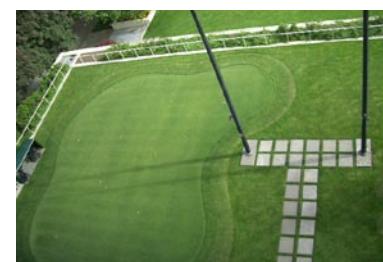
Energy & Atmosphere

Efforts in the Energy & Atmosphere category garnered 11 points toward certification.

Two-hundred Market Place's primary energy source is the electrical grid. In 2001, a micro-turbine that generates electricity from natural gas was installed. According to the building engineer, this prototype project generates 30 kilowatts of electricity for the building, which is sufficient power to accommodate emergency/night lighting circuits for the entire office facility.

In 2004, direct current motors running the elevators were switched to alternating current motors that function only when in use, lowering energy costs. The control system for the elevators was also replaced, increasing elevator speed significantly and improving tenant satisfaction.

The building achieved an ENERGY STAR rating of 79 at the time of LEED certification. The commissioning



Rooftop gardens and greens

process identified several steps to improve energy efficiency and subsequent to certification, continued improvements in energy performance resulted in a much improved ENERGY STAR rating of 94 in 2008. In 2009, the building's ENERGY STAR rating is 96.

Some of the more significant energy projects that have occurred since 200 Market Place achieved LEED certification are the replacement of the garage lighting with energy efficient bulbs and the addition of light sensors, variable frequency drives, and carbon dioxide sensors to the exhaust fans in the garage.

Water Efficiency

Costs for water in the Northwest are comparatively minimal, suggesting that owners who decide to invest in water reduction strategies are probably more concerned about water conservation than they are about the relatively incidental costs of this resource. However, Portland, OR, in particular, faces serious environmental ramifications from continued storm water runoff from its central business district into the Willamette River. As such, steps to both conserve water and avoid runoff will have long-term benefits to property owners, tenants, and residents.

The 200 Market Place building employed a variety of strategies to achieve two certification points for water efficiency:

The owner installed 114 new low-flow toilets (1.6 gallons per flush), resulting in a 60% savings per flush. One-gallon flush kits installed on 37

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urinals reduced water usage to 1.0 gallon per flush, representing a 67% savings per flush. The addition of 0.5 gallons per minute (gpm) aerators in 114 faucets significantly reduced water usage from 2.5 gpm, creating a savings of nearly 80%. According to Aye, the LEED consultant on the project, the initiative cost \$53,000 and resulted in a reduction in water use of 1.6 million gallons in the first nine months, resulting in over \$16,000 in savings in the first year.

The water efficiency projects in the building led to a significant drop in water use and costs from 2004 to 2007. This decline in water usage and costs are shown in Chart 1.

Chart 1. Water Usage & Cost Summary.

Year	Usage (gallons)	Cost	\$/gallon
2004	8,293,076	\$61,412	\$0.00741
2005	8,293,076	\$62,358	\$0.00752
2006	8,239,220	\$55,563	\$0.00674
2007	7,920,572	\$49,182	\$0.00621

Sources: 200 Market Place Staff and Cushman & Wakefield, Inc.

Annual water expenses for 200 Market Place declined by approximately \$12,000 between 2004 and 2007. This was accompanied by a reduction in owner costs per gallon, as well. These two factors contributed directly to improved bottom line results for the building owner. It should be noted that this cost reduction occurred despite an increase in overall building occupancy.

Greenhouse gas emissions. The greenhouse gas emissions of the 200 Market Building were significantly reduced as a result of improvements to the building at the time of LEED-EB Gold certification. According to Elaine Aye, the building should reduce carbon dioxide emissions by the following amounts:

- Based on a waste audit, 83% of the building's waste and 96% of construction waste from sustainable tenant improvement build-outs were diverted from a landfill, and 128 metric tons of carbon dioxide emissions will be eliminated annually.
- By saving approximately 2.5 million kilowatts of electricity per year, 1,381 metric tons of carbon dioxide emissions will be eliminated annually. By saving approximately 30,000 therms of natural gas per year, 188 metric tons of carbon dioxide emissions will be eliminated annually.
- Based on water usage savings of 1.6 million gallons per year, 40 metric tons of carbon dioxide emissions per year were eliminated.

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Materials & Resources

The 200 Market Place building achieved fifteen points for the Materials & Resources category based on the following:

A building recycling program was initiated and in May 2005, Community Environmental Services conducted a waste characterization of a 289.9-pound sample of waste from the building's garbage compactor. The building materials contained 38.6% recyclable materials, a very respectable showing for a large multitenant building with a diverse tenant profile.

A high performance green tenant improvement program was implemented to reduce waste from tenant improvement buildouts.

The building has also created a high performance green purchasing program for office equipment, furniture, and other furnishings.

Indoor Environmental Quality

Two-hundred Market Place achieved nine points for its efforts in improving the development's indoor environmental quality (IEQ).

The building makes efficient use of natural daylight via windows positioned for maximum exposure to outside sunlight, reducing the amount of interior lighting required by building tenants. The use of more natural daylight instead of indoor lighting has resulted in lower electricity costs.

The building is served by an outside air system, which includes fans on

the roof that provide fresh air to each floor. According to building ownership, fresh air flow into the building currently exceeds Portland's building code by two to three times the required amount. Based on market surveys and tenant interviews, the introduction of more fresh air into the building has increased tenant satisfaction and enhanced the building's marketability.

FINDINGS AND VALUATION ASPECTS

Valuations/appraisals or the types of analyses used in appraisals are the typical tools used by investors, valuers, lending organizations, and other market participants to estimate the market value of a property. As noted previously, this process relies heavily on empirical data, including sales data (prices paid, capitalization rates, rates of return), operational costs (costs and/or savings associated with specific strategies), and property performance over time (performance track records to validate/dispute the claims of efficiency and savings from various high performance green strategies). Given that green buildings account for roughly 2% of buildings in the United States, there is a scarcity of high performance green real estate available for comparative purposes, and therefore a lack of statistically relevant properties from which analytical comparisons can be drawn. This combined with owner reticence to share operating data on the properties that do exist has created a significant challenge for appraisers and analysts.

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As a result of this situation, an appraiser must typically rely upon expense data from competing non-green buildings, and/or the subject's operating history, if available. While cost data may be readily available for various features, the long-term benefits, in many cases, have yet to be defined. Therefore, costs are incorporated without any commensurate consideration of appropriate long-term benefits, skewing analytical results.

Nonetheless, with high performance green practices and protocols experiencing increased adoption in all real estate sectors in the United States and beyond, the valuation community in the United States is being pressed to discern how green strategies should be incorporated in the valuation process and what impact they may have on market value.

The following paragraphs discuss the value-related aspects of the strategies employed at 200 Market Place to achieve LEED certification. These discussions are framed in the categories for which LEED points can be earned.

Sustainable Sites

A large part of its success in achieving points in the Sustainable Sites category was due to 200 Market Place's location in downtown Portland and the inherent benefits of proximity to public transportation. As an existing building, it was not sited because of these factors, but enjoys the benefit of being well-located because of them.

From a valuation, underwriting, or investment perspective, the locational characteristics of a property are some of the most important factors considered when assessing asset value potential. For existing buildings, these characteristics are already in place; owners have little, if any, impact on a property's overall visibility, access, neighborhood, or competitive surroundings. The best strategy for an investor when considering an existing building is to be sure that the locational aspects of the property are as positive as possible.

The rationale for mentioning the importance of locational characteristics in this discussion is that it is extremely difficult to separate and quantify locational attributes from other property

From a valuation and investment perspective, there is currently increasing discussion that total operating costs (TOC) should be used as the appropriate basis for assessment of rent and expense levels. TOC would factor in all real estate related expenses in determining what a tenant could or should bear in operating costs and rent. If operating expenses are lowered, some owners would take the position that this would allow the tenant to pay higher base rents. Other owners might view the opportunity to lower tenant operating expenses as a means to achieve and maintain higher occupancy and tenant retention rates.

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specifics when analyzing value. The concept of *100 percent* locations is prevalent throughout the United States and is often the greatest determinant in an investor's decision to purchase a particular property. A property's specific location relative to its competition, its access to major transportation arteries and public transport, and overall visibility are critical factors in assessing the marketability of a property. It has been found that in a number of instances where green premiums were reported either for rents or in sales prices paid per square foot, no analysis was provided to discern whether other building attributes, in particular a property's locational characteristics, could have been the basis for any premium paid.

It is interesting to note that the authors have found that properties exhibiting the greatest success in adopting and effectively implementing high performance green strategies have talented building engineers who have played a critical role in the incorporation and long-term success of the strategies employed. Owners of successful green buildings often report that their chief engineers are dedicated to ensuring that the buildings will achieve optimum systems performance and deliver maximum tenant satisfaction. Two-hundred Market Place is no different.

Until there is adequate empirical data to validate such a claim that green premiums exist (and in some markets, such as Portland, Oregon, there is some data to support this premise), it is advisable that prudence, caution, and thorough analysis be taken prior to any proclamations of premiums for green features.

Water Efficiency

It is clear from the savings reported in water usage that the steps taken to increase water efficiency at 200 Market Place were successful. This is particularly important from a valuation perspective because 200 Market Place has now created a documented history of performance in this expense category. Any analyst (investor, valuer, or underwriter) making future operational projections for this property now has the benefit of actual property performance upon which future projections can be made. This is in contrast to relying on industry averages based on properties that may or may not actually constitute appropriate comparisons for 200 Market Place.

Green Lease Clauses

It is also worth noting that in properties that utilize gross leases, such as 200 Market Place, strategies that reduce water usage (or other operating expenses), produce savings that flow directly to net operating income. At properties where net leases are utilized and expenses are passed through to tenants, savings flow directly to the tenant. As such, lease structures have historically been significant determinants in whether green features were

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incorporated into existing buildings. With gross leases, owners favored incorporation of these features because a reduction in operating costs under a gross lease goes to their bottom lines. Under net leases, the savings flow to the tenants. This tended to make owners resistant to upgrading their buildings if they were not going to see a direct improvement to their financial results. Today, with the introduction of green lease clauses, alternatives in which tenants and owners can share in both the expense and the upside are overcoming many of the former challenges related to typical lease structures. While still in the early stages of development, increasing numbers of investors, owners, and tenants are working toward more mutually beneficial lease agreements.

Ultimately, strategies that will prove mutually beneficial to tenant and landlord will have the greatest possibility of broad adoption. It is likely that such strategies will be implemented through the incorporation of green lease clauses into standard leases, a practice that is gaining increasing momentum throughout the United States and beyond.



*Employees enjoying rooftop
bocce ball*

Energy & Atmosphere

In assessing the strategies to achieve points in the Energy & Atmosphere category, the most important aspects of 200 Market Place's energy program are that it is consistent, continuous, innovative, and effective. John Russell and his chief engineer, Mark Montgomery, constantly looked for ways to reduce energy usage and improve building performance. This is clearly reflected in the building's ENERGY STAR ratings that have shown consistent improvement since LEED certification (from 79 to 96).

Reduced utility usage and lower energy costs can result in direct benefits to bottom line results: less costs equal increased bottom line revenue, and all other factors being equal, enhanced asset value. The possibility of additional benefits via improved tenant retention and less downtime between leases could generate even better results.

The converse is just as obvious: if owners do not take steps to improve building performance, tenant satisfaction and retention could suffer. By consistently looking for ways to improve overall building performance Russell and Montgomery 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.

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Materials & Resources

The points achieved in this category were awarded for a variety of efforts, with particular emphasis on waste reduction and the use of alternative, low impact environmental materials. More interesting from a business and investment perspective was the significant headway made in the implementation of tenant recycling programs.

Many building owners commit to using recycled materials and reduce waste from tenant improvement build outs. However, 200 Market Place has gone well beyond its commitments and engaged tenants in widely-accepted recycling and composting initiatives.

The relevance of this factor is obvious when viewed from the perspective of tenant retention. According to discussions with a LEED consultant, 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 in their workplace; they enjoy participating in the various activities and events that the property and tenant groups offer. The fact that these activities may have a broader, positive impact on the environment is even more appealing to the tenants.

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 performance track record. The ability to project higher occupancy for a

property, along with the track record to support it, reduces the inherent risks associated with building occupancy. Over time, the ability to achieve high levels of occupancy and tenant retention indicates better financial performance, as well as maximum value potential and investment returns.

Indoor Environmental Quality

The topic of indoor environmental quality (IEQ) has received increasing attention and importance as the move toward energy efficiency and high performance green building in the commercial real estate world has gained momentum.

Based on discussions with the property management professionals at 200 Market Place, the increased amount of fresh air that circulates to the tenants, combined with market perception that more fresh air equals a healthier environment, has resulted in greater tenant satisfaction and enhanced marketability. If greater tenant satisfaction can be translated into enhanced tenant retention, then these results can be converted into quantifiable impacts that are reflected in both cash flow assumptions and estimates of market value.

Though a growing number of studies support the premise that better IEQ results in improved worker productivity, few cases have proved that this factor has a direct impact on asset value. What is most relevant to the investor, valuer, or underwriter assessing a non-owner-occupied commercial property is whether the potential benefits

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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 operational 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 gleaning 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.

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Chart 2. Buildings considered competitive to 200 Market Place.

Building Name & Address	Year Built	Unit Size (NRA)	Lease Date	Effective Rent (\$/SF)	Lease Type	Mos. Free Rent	TI's PSF	Escalations (per year)
KOIN Center 222 SW Columbia St.	1984	25,070	08/06	\$21.58	Full Service	2	\$20	\$2.00 in year 4
Umpqua Bank Plaza One SW Columbia St.	1974/ 1997	7,764	12/06	\$22.20	Full Service	1	\$28	3%
KOIN Center 222 SW Columbia St.	1984	12,191	03/07	\$26.54	Full Service	0	\$24	2.5%
One Main Place 101 SW Main St.	1980	2,846	04/07	\$25.00	Full Service	1	\$30	3.5%
Wells Fargo Center 1300 SW Fifth Ave.	1972	3,729	11/07	\$26.53	Full Service	0	\$0	None (renewal)
KOIN Center 222 SW Columbia St.	1984	17,060	02/08	\$25.25	Full Service	0	\$42	3%
KOIN Center 222 SW Columbia St.	1984	6,626	12/08	\$27.74	Full Service	0	N/A	N/A

Source: Cushman & Wakefield

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.

Year	Avg Asking Rent (\$PSF)
2005	\$20.36
2006	\$22.07
2007	\$23.90
2008	\$26.03

Source: CoStar

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.

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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.

Chart 4. Monthly energy consumption for 200 Market Building.

	2004	2005	2006	2007	2008	2009 YTD
Low	N/A	N/A	444,000	450,000	402,000	411,000
High	N/A	N/A	717,000	624,000	570,000	429,000
Average	N/A	N/A	521,750	503,750	459,750	420,000
Annual Total	5,604,000	5,757,000	6,261,000	6,045,000	5,517,000	N/A
% Annual Change	N/A	2.73%	8.75%	-3.45%	-8.73%	N/A

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.

Chart 5. Monthly energy costs for 200 Market Building.

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

Source: Cushman & Wakefield, Russell Development Company

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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 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

Year	\$/SF
2007	\$11.00
2008	\$10.93
2009 (budget)	\$10.57

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 0.64% and they are projected to decline by an additional 3.29% 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.

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Chart 7. Expense comparison.

Expense Category	BOMA Average	LEED-EB Average	200 Market Building
Utility Expenses	\$2.09	\$1.76	\$1.19

Source: *The Economics of LEED for Existing Buildings For Individual Buildings*, Leonardo Academy, April 21, 2008.

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.

Occupancy 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.

Year	Occupancy
2005	92%
2006	94%
2007	95%
2008	95%

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.

Building Name	Year Built/ Renovated	Green Features	Occupancy (1Q 2009)
200 Market Building	1973/1990	LEED-EB Gold 2006	98%
KOIN Center	1984	None	91%
Umpqua Bank Building	1974/1997	Energy Star (2008)	87%
Wells Fargo Tower	1972	None	95%
One Main Place	1980	None	95%

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

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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



200 Market rooftops, north view

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performance green practices and protocols. Leveraging its reputation of environmental responsibility, building management has also created a profile for the property as a high performing building, continually seeking improvements in operational performance via reductions in energy, water use, and CO₂ emissions.

Although it is not a new building, the property remains competitive at least in part due to the efforts of a committed management team and engineering staff that consistently seek and achieve ways to garner tenant satisfaction and enhance building performance. This integrated team approach is a hallmark of successful high performance green buildings.

The 200 Market Place building will certainly face challenges in the long term as new high performance green products are brought to market. It is the understanding of this research team that every Class A building currently under construction in Portland is seeking some form of green certification.

INTERVIEW

For the purposes of this case study, John Russell, the owner of 200 Market Place and president of Russell Development Company, was interviewed. Russell Development began renovating 200 Market Place immediately after purchasing it in 1988 and in 2005, Russell decided that the property should seek LEED certification. In 2006, 200 Market Place was awarded the first LEED-EB Gold certification for a multitenant existing building in the country.

According to Russell, the initial impetus for achieving LEED certification was to establish a point of difference for the property, setting it apart from its competitors. Even though some potential tenants do not necessarily prioritize being in a green building, Russell believed that LEED was the most widely accepted rating system currently available for office buildings. The certification provides a unique basis for comparison. At the very least, a LEED rating validates that the building is well maintained.

In discussing the various upgrades and high performance green features, Russell noted that small changes resulted in both decreased operating costs and increased tenant satisfaction. Small valves of negligible cost were added to fans to bring in outside air. This change has garnered positive tenant responses. Adding a sensor to the hot water system resulted in significant savings in both water and energy. Tenants have established green practices within their own spaces, and Russell Development has been able to incorporate these practices into broader policies for the entire building.

Russell believes that there is growing market perception that incorporation of high performance green principles and practices is directly related to enhanced marketability and increased tenant attraction and retention. As a result, Russell Development continues to implement building improvements and has set a goal to achieve LEED-EB Platinum certification.

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VANCOUVER CENTRE

650 West Georgia Street, Vancouver, British Columbia, Canada

EXECUTIVE SUMMARY

In 2001, Great West Life Realty Advisors (GWLRA) purchased the 34-storey, 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)



Vancouver Centre

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 returned a 19% return on investment (ROI) and while a payback of four years was anticipated, the extended implementation to minimise 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. Benefits were unlikely to add directly to asset value since they were abstracted in different ways.
- The way in which sustainable attributes translate into value is not simple or direct, and may alternatively be found in other factors rather than higher capital value, such as higher profit, increased staff productivity, or savings in tenant operating costs.
- 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 in less direct ways and distinguishes

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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 optimise revenue flow and respect existing tenancies, which was completed in May 2004.

The approximate C\$2.5m renovation project included new integrated Heating Ventilation and Air Conditioning (HVAC) system comprised of a variable volume chilled 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.

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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 11m kWh, equating to total savings claimed of C\$1,008,402.

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 detraction to some investors, it attracted the purchasers, who have experience in optimising investment income through renovation projects

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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*.

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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.

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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



Vancouver Centre lobby

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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 uninformed 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."¹⁹
- "As the largest single operating expense in typical commercial buildings, energy costs are typically an important factor in building value."²⁰

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.

19 See http://www.usgbc.org/Docs/About/usgbc_intro.ppt#298,8, Economic Benefits. USGBC regularly updates its Web site and this document may have subsequently been amended.

20 See <http://www.imt.org/Papers/Telergy.pdf> "The Impact of Energy Costs on Commercial Building Value," Institute for Market Transformation, March 2003. Analysis by a variety of sources shows that energy costs as a proportion of businesses' total operating costs are in the order of 1-3%. For comparison, a Deloitte Touche 2005 study of Calgary for BOMA Canada showed energy as 17.8% of average occupancy costs, excluding rent, for Class A offices. The author of this paper considers that energy costs might more appropriately be summarised as possible *detractions or reductions* from value in most modern buildings. A high performance green building might be a net contributor to the grid and thereby add value to the building.

- 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-dependant.²¹ 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.²²
- 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

21 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.

22 This is sometimes referred to as the principle of substitution. A buyer only needs to pay \$1 more than the next highest bidder to secure the purchase since it makes no sense to pay more.

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.

- 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.²³

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

23 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 seek its share of this benefit, making it an incentive for the buyer to complete the considerably larger goal of purchasing the building.

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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 positioning 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.



Vancouver Centre lobby

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

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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.

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The principle behind a green lease is to address this by restructuring the landlord-tenant relationship. Several attempts have been made at green leases. In Canada, the main attempt was led by the Real Property Association of Canada (RealPac), which represents major property owners. RealPac worked with its member companies and BOMA Canada in Ontario and produced resources for owners, including explanation of the issues and a green lease template and explanatory guide.²⁴ This included references to other green lease initiatives, including an earlier initiative in Australia.²⁵ A study in British Columbia that was sponsored by BOMA B.C., the Green Buildings Foundation, and the B.C. provincial government is oriented more towards energy.²⁶ The issue with these attempts at addressing the landlord-tenant relationship is related to realigning the costs and benefits so the landlord is incentivised to implement more sustainable features.

In evaluating the Vancouver Centre, the energy retrofit costs portion of the project was assessed (Chart 1). It was found that the same attributes that gave a 19% approximate ROI would increase capital value if they were realigned so the savings could be attributed to rent. In this example, the benefit may be as much as 10 times the ROI. The mechanism for this would require the tenant to continue paying existing costs (i.e.,

no difference in the total costs of occupancy) in return for the landlord undertaking the retrofit and paying for them without recovering the costs from the tenant. It would need the transferred operating costs to be deemed part of the base rent, allowing the savings to be capitalised. Other factors associated with lease remainder and risk would also need to be addressed, which exceeds the scope of this review.

Note that Chart 1 is representative of how an analysis might be structured rather than reflecting the actual financial picture at the Vancouver Centre (i.e., certain inputs have been adjusted to respect confidentiality).²⁷ It nevertheless portrays the thought process and potential value of the concept.

As this marks a departure from traditional landlord-tenant relationships, the author is grateful for peer review and input from Professor Sarah Sayce at Kingston University in London, as well as her colleagues and students; Peter Clark; Theddi Wright Chappell at Cushman & Wakefield, Seattle; Sandra Cawley at Burgess, Cawley Sullivan appraisers in Vancouver; Helen Goodland at Light House Sustainable Building Centre in Vancouver; and Don Harrison, Peter LaForest, and Robert Kavanagh at GWLRA.

More work in this area is desirable as it is currently untested. However, it has the potential to contribute

²⁴ This initiative is available at http://www.realpac.ca/s_223.asp.

²⁵ This initiative by Investa is available at http://eco-efficiency.management.dal.ca/Files/Green_Lease_Guide.pdf.

²⁶ The author was involved in this study, which is available at <http://www.greenbuildingsfoundation.org/news.php?id=18>.

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appreciably to encouraging viable building retrofits, an important area for investment resilience. If successful, it indicates a potentially positive improvement in asset value and net investment cash flow for landlords without adding cost to the tenants. This may be sufficient to encourage owners to consider more sustainable retrofits as a method of enhancing value.

Broader Sustainable Impacts Affecting Value

Several broader issues were identified that either potentially affect asset value or have other implications. These relate to aspects not valued in current practices but that are embedded in resources consumed by buildings or emissions created by buildings. Some of these attributes were noted at the Vancouver Centre. At the time of acquisition, none were taken into account but they may increasingly affect value. Impacts of climate change observable in some jurisdictions are already affecting and will potentially increasingly affect resources consumed by buildings, impacting costs and value. Some of these impacts include the following:

- Water supply is becoming critical in some locations, including the Southern United States and Australia. Typical office buildings with modern air conditioning systems are significant consumers of water, although only a small percentage of this is drinking water. This further reduces scarce supply. Pressure to conserve can be expected to increase in locations not yet experiencing scarcity, which will affect costs. The Vancouver Centre has the capability to reduce water consumption if the economics of this issue rise as much as anticipated.
- Governments in many jurisdictions are starting to signal that the cost of carbon dioxide emissions has to be considered. These governments are taking steps to influence how this affects finances through taxes and credits. For example, the United Kingdom government now requires consideration of the true cost of carbon dioxide emissions in capital decisions. British Columbia's carbon dioxide emissions tax is starting to affect some building resource charges, internalising costs within building value. This may begin to affect investment decisions. It currently has low impact on building economics, but has the potential to be a significant concern with direct impact on appraised value and net investment cash flow.
- Heating is supplied by a district heating system, which is reported to increasingly need upgrading, presumably raising the cost. Because this price impact is beyond a building's system boundary, the impact has not yet been reflected in building cash flow. If this cost rises, it will be increasingly viable to consider alternate approaches for energy and resource management.
- The district energy loop at the Vancouver Centre is steam powered, generated by oil and natural gas boilers, which will potentially attract upstream carbon dioxide tax. The system is

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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.



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- 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.

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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 principle*. 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.

²⁸ See, for example, Deutsche Bank's *Economic Stimulus: The Case for Green Infrastructure, Energy Security and Green Jobs*, available at https://www.dws-investments.com/EN/docs/market-insight/R-8217-1_2009_Short_White_Paper.pdf.

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Chart 1. Summary Financial Analysis – Energy Retrofit.

Assumptions (Vancouver Centre - Class A office)		
Building size sq ft		472,422
Finance rate		5.00%
Green savings psf pa		\$0.51 psfpa
Green savings total pa		\$240,935 pa
Life cycle		12.00 yrs
Yield (Cap rate)		6%
Years Purchase (1/yield)		16.666666667
Energy retrofit costs psf		\$4.32 psf
Energy retrofit costs		-\$2,040,863
Rent (excluding utility costs) psf		-\$29.00 psf
Rent paid to landlord		-\$13,700,238 pa
Utility costs psf		-\$2.61 psf
Renovation		
Renovation capital costs		-\$2,040,863 pa
Renovation finance over life cycle		-\$219,296 pa
Renovation savings		\$240,935 pm
Renovation profit (loss) pa		\$21,639 pa
Traditional "simple payback" analysis		8.47 yrs
Maximum breakeven interest rate		7.08%
Value Analysis		
Tenant		
Tenant's utility payments	Before	After
	-\$1,233,021 pa	-\$992,086 pm
Rental increase		-\$240,935 pa
Tenant's total occupancy costs	-\$14,933,259 pa	-\$14,933,259 pa
Landlord		
Landlord's gross rent	\$13,700,238 pa	\$13,941,173 pa
Less: cost of finance		-\$219,296 pa
Landlord's net rent	\$13,700,238 pa	\$13,721,877 pa
Landlord's increase in net income		\$21,639 pa
Increase in capital value, after debt service		\$360,647
Capitalised value after debt service	\$228,337,300	\$228,697,947
Retrofit value as % of building value		0.16%
Profit		
Capital investment		-\$2,040,863
Capitalised gross annual return on investment		\$240,935 pa
Gross increase in capital value		\$4,015,587
ROI before debt service		196.8%
Capitalised value after debt finance		\$360,647
ROI after debt service		17.7%

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.**

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