
VALUATION ISSUES IN A GREENING WORLD

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INTRODUCTION

As most readers of this publication are well aware, the concept of “green building” or “sustainable development” focuses on meeting the needs of the current generation without compromising the ability of future generations to meet their own needs. More specifically, “green building” references the characteristics and quality of a subject property resulting from the employment of the principles and methods of sustainable construction. A significant body of research on this concept is evolving, espousing the favorable social, environmental, and economic impacts of this approach to real estate development.

The concept of green building evolved in Europe where space and resources are less plentiful than in the United States. Nevertheless, federal, state, and local governments in the United States have all embraced the concept over the last fifteen or twenty years. And despite clear evidence of a politically driven agenda, it is difficult to argue the sensibility of green building; however, in a capitalist culture sensibility implies an increase in economic value. Regardless of minor operational efficiencies, environmental impact reduction, and natural resource supply/demand concerns, the true test of long-term “green building” as a cultural trend will be an economic one. Simply put, green buildings will have to provide value superior to that of conventional buildings if the concept is expected to become the status quo.

MARKETS IN FLUX

In recent years the general public’s awareness of the economic and social costs associated with energy conservation and finite resources has escalated dramatically for a variety of reasons. For many decades the United States has been a disproportionate producer and consumer (on a per capita basis) of global commodities. Competition resulting from the rapid development of the Indian and Chinese economies, in particular, is being felt as competition increases for those commodities. The real estate sector, as a major user of natural resources, therefore draws the attention of the global forces concerned about climate change. Although the real estate community has been fairly proactive on environmental issues elsewhere around the planet, the green building movement in the United States has been gaining interest mostly in the corporate and public sectors,

where the majority of green building owners and users are found. The major users of green buildings are government and large corporations who occupy their own buildings, but the business climate in America is changing rapidly. Eventually, broad market perception and a general awareness of the additional benefits of “green building” must be commonplace if the market is to ultimately accept and expect green buildings. Without question, political and social pressure on publicly traded owners and operators of income producing real estate to invest in, or provide, green product is steadily increasing, as evidenced in a recent joint study conducted by Deloitte and Charles Lockwood.¹

In effect, a new submarket of real estate product is being created, albeit slowly. The first Leadership in Energy and Environmental Design (LEED) certified building in the United States was erected in 1996,

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and as of this writing, there are 1,702 LEED certified buildings in the United States according to the U.S. Green Building Council.² Unfortunately, as reported by CoStar in a study released in May of this year, although buildings that carry LEED or Energy Star certifications exhibit higher lease and occupancy rates than their conventional peers, the study lacks sufficient evidence to demonstrate that the LEED and Energy Star ratings are responsible for the value enhancement. The results may simply reflect a tendency for high-value properties' management to pursue the certifications. Nonetheless, there is sufficient social, political, and mainstream pressure in the current environment to, in effect, force the major institutional real estate investors and operators to embrace sustainability and the "green building" concept.³

GREEN STANDARDS

Despite a lack of consensus on specific standards, government entities and the major U.S. real estate institutions appear to be settling on adoption of the U.S. Green Building Council's LEED certification program as a market standard.⁴ According to the U.S. Green Building Council, "LEED certification provides independent, third-party verification that a building project meets the highest green building and performance measures. All certified projects receive a LEED plaque, which is the nationally recognized symbol demonstrating that a building is environmentally responsible, purportedly profitable, and a healthy place to live and work. There are both environmental and financial benefits to earning a LEED certification."

LEED certified buildings tout asset value enhancement as a result of lower operating costs, reduced waste being sent to landfills, water and energy conservation, healthier and safer environments for occupants, reduced greenhouse gas emissions, tax rebates, zoning allowances and other incentives in hundreds of cities, and they demonstrate an owner's commitment to environmental stewardship and social responsibility.

According to the U.S. Green Building Council, commercial buildings as defined by standard building codes are eligible for certification under the LEED for New Construction, LEED for Existing Buildings, LEED for Commercial Interiors, LEED for Retail, LEED for Schools, and LEED for Core

& Shell rating systems. Eligible building types include, but are not limited to, offices, retail and service establishments, institutional buildings (e.g., libraries, schools, museums, and religious institutions), hotels, and residential buildings of four or more habitable stories.

At present, there are four "shades" or levels of LEED certification available to building owners/developers. Certification is based on an accumulation of points awarded for satisfying specific environmental criteria for building design, construction, operations, and building management factors. Basic LEED certification for new construction requires a developer to accumulate 26 points; 33 points are required for silver level certification, 39 points are required for gold level certification, and a minimum of 52 points are required for platinum certification.⁵ By contrast, a building can qualify for EnergyStar recognition from the U.S. Environmental Protection Agency and the U.S. Department of Energy who co-sponsor the award, merely by implementing or retrofitting energy efficient systems (e.g., lighting, heating, and cooling), documenting the cost savings, and applying for the award.⁶

UNDERWRITING ISSUES

In July of 2005, Wells Fargo committed to lending over \$1 billion toward environmentally friendly projects over the next five years. Within one year, Wells Fargo's investment in energy efficient buildings exceeded \$700 million with announced plans to finance its twelfth LEED certified building. By early 2008, Wells Fargo had financed more than \$1.5 billion in LEED certified buildings ranging from offices to apartments to schools. J.P. Morgan, Bank of America, PNC, and others have since followed suit.⁷

Nonetheless, these institutions have all candidly reported difficulty in establishing discrete underwriting criteria for green buildings and sustainable projects, citing a shortage of reliable valuation data and benchmarks. And until such time as plentiful market extracted comparable data or a reliable database exists, appraisers and underwriters will continue to have difficulty in valuing green buildings differently from conventional product. As a result, to our knowledge, no major lenders are yet offering superior loan terms for green projects.

Likewise, commercial property and casualty insurers are confronted with similar underwriting problems. While property insurers have begun to offer special coverages for green and LEED certified buildings, they emphasize the need for proper valuations to avoid excessive premiums or underinsurance. The providers of other types of insurance have been more reluctant to provide coverage or program enhancements. Professional liability insurers report claims being brought against architects and engineers involved in green building projects for issues ranging from qualifications to inadequate building components. Builder's risk insurance underwriters are concerned about project delays associated with green construction and the installation of new technologies. Casualty underwriters consider green building as more risky than conventional construction. Surety underwriters are concerned about arduous contract provisions and risks associated with inadvertently guaranteeing specific performance or efficiency in green projects.⁸ No doubt, as sustainability and green building becomes more commonplace, and more market evidence is documented, these concerns will ease as new solutions are generated.

THE APPRAISAL PROCESS

An appraiser's value to society stems from his ability to develop an independent opinion of value that can be confidently relied upon. Appraisers, auditors, and independent stock analysts are the gatekeepers of our economic system. As such, professional appraisers strive to be objective in their analytical thought processes where their opinions may influence the actions of others. The real estate appraisal, or valuation, process is defined as the systematic procedure an appraiser follows to provide answers to a client's questions about real property value.

It is useful to know that the profession is regulated at both the federal and state level. The Uniform Standards of Professional Appraisal Practice (USPAP) are promulgated by the Appraisal Standards Board of the Appraisal Foundation. The standards detail the procedures necessary for appraisers to develop an appraisal, analysis, or opinion and the requirements for the manner in which the value conclusion is communicated. USPAP divides ap-

praisal practice into three general categories of service: appraisal, appraisal review, and appraisal consulting. State regulatory agencies are responsible for the licensing of appraisers and the enforcement of the uniform standards.⁹

The first step in the appraisal process is identification of the problem. Per federal law, the appraiser must identify the client and intended users of the valuation analysis, identify the intended use of the report, identify the purpose of the assignment which includes a specific definition of value for the engagement, identify the effective date of the opinion of value being sought, identify the relevant characteristics of the property, and recognize any extraordinary assumptions or hypothetical conditions affecting the subject property.

An example would be where the client is a lender. The intended users are the lender and the borrower. The intended use is to help the lender underwrite a loan secured by the subject property. The assignment is to develop an independent opinion of the market value for the subject property as of a specified date. A hypothetical condition requires the appraiser to value the subject property as if something were true that presently was not. For example, the appraiser is asked to value the property under a different zoning or land-use code than is currently in place because a zoning variance is being sought. Whereas an extraordinary assumption requires the appraiser to assume that something will occur, such as the completion of proposed construction in order to develop a prospective opinion of value.

Of particular concern to appraisers are the concepts of cost, price, and value, which are frequently confused by laymen. The cost, price, and value of a particular commodity are not necessarily the same number. Appraisers use the term cost in relation to production, not exchange. While cost may be an estimate or a fact, price is always a fact. Appraisers apply the term price to any amount that a purchaser pays a seller as a result of the circumstances surrounding their transaction. For example, the combination of hard and soft costs, plus land acquisition cost, will render the cost of new construction. Supply and demand factors in the building's market will determine its value to market participants regardless of the cost to construct. Typically, when the cost of

new construction exceeds market value, the principle of substitution dictates that participants will trade in existing product. Only when a developer can realize entrepreneurial profit will new supply be added to the market.

Most real property appraisal assignments are tasked with identifying the market value of a specific property. And although there are many definitions of market value derived from a variety of sources, it is generally agreed that the term results from the collective value judgments of market participants. Federally insured financial institutions require the following definition of market value:

The most probable price that a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently, knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are typically motivated;
2. Both parties are well informed or well advised, and each acting in what he or she considers his or her own best interest;
3. A reasonable time is allowed for exposure in the open market;
4. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.¹⁰

With sustainable development, or green building, being a relatively new concept, appraisers will need to ascertain if the buyer and/or seller of a particular property is typically motivated. Did the price paid reflect investment value or market value? Investment value is the value of a property to a particular investor based on that investor's investment requirements, not necessarily market value. If a buyer is intent on acquiring only LEED certified product, then it is

likely that a premium over market value for conventional product will be paid on the anticipation of greater rents and lower operating expenses.

The second step of the valuation process is to determine and report the scope of work required to complete the assignment. In this section of the report the appraiser will iterate exactly what steps were undertaken to complete the assignment.

The third step is to describe the subject property and collect all data necessary to complete the assignment. In describing the subject property as a green building, appraisers should take great care to enumerate the various component items that contribute to any green certification designation, such as a LEED Gold rating, and identify those that may affect the property's economic value. Market area data typically includes the general characteristics of the neighborhood, city, or region in which the property is located. Data on comparable properties that must be analyzed include land sales, improved sales, listings, offerings, effective rents, vacancy rates, expense rates and ratios, capitalization and equity rates, current construction costs, and depreciation information.

Experienced real estate appraisers are accustomed to coping with changing market conditions and inadequate market evidence due to the fact that real estate markets are imperfect by nature. From an appraisal perspective, the "greening" of America is just another new market condition that must be analyzed in the light of available market evidence. The United States Green Building Council's LEED certification program identifies six areas of potential recognition for commercial properties: (1) sustainable site development; (2) water efficiency; (3) energy and atmospheric efficiency; (4) use and reuse of materials and resources; (5) indoor environmental quality; and (6) innovation and design. If "economic enhancement" was a factor, appraisers (and market participants) might be better able to isolate the various value enhancements attributable to green building.

Finding an adequate number of suitable comparables will prove to be the most challenging problem for the foreseeable future because "green buildings" cumulatively represents a de minimis share of the country's property inventory; less than two percent of non-residential construction. Until such time that access to reliable comparable data, via a survey

or database, becomes available, the data gathered by individual appraisers will be limited, providing anecdotal evidence at best. Critical reviewers and underwriters may find such evidence unpersuasive because most appraisers do not have the specialized engineering knowledge required to discriminate between construction component alternatives. The U.S. Green Building Council would do well to undertake the publication of such data for the benefit of the green community and society at-large.

MARKET ANALYSIS AND HIGHEST AND BEST USE

The fourth step in the valuation process is to analyze the data. The appraiser must first conduct a market analysis to study the supply and demand relationships impacting the subject property. Market analysis of supply and demand factors drive the highest and best use, and ultimately the market value, of any specific property. Armed with a thorough understanding of these supply and demand relationships, the appraiser is then prepared to conduct the Highest and Best Use analysis.

In the market analysis process, the appraiser must determine that the reasonably probable and legal use of the subject property is physically possible, appropriately supported, financially feasible, and results in the highest value. The analysis begins with an in-depth review of the property's economic base, site, and location to determine what alternative uses the site might be put to. In determining the highly probable uses to which a site might be put, the appraiser employs a screening process that analyzes property productivity, supply and demand, and the subject's likely market capture rate. This information is subsequently utilized in the highest and best use analysis.

Highest and best use analysis is composed of two four-pronged tests. The first set is a consideration of the property as if vacant. In this phase, the appraiser must first analyze the legal permissibility of uses to which the land might be put. This is typically accomplished by reviewing the relevant land use and zoning codes. Next the appraiser must analyze what improvements might be physically possible given the existing or potential regulatory restrictions encumbering the site. These remaining possible uses are

then analyzed for financial feasibility. The highest and best use of the site as if vacant is the use that produces the highest residual land value consistent with the market's acceptance of risk and return. This conclusion should be stated in terms of use, timing for use, and most probable users or buyers. Development of the Highest and Best Use conclusion is arguably the most important aspect of the overall report.

Analysis of the financial feasibility for any given green project will require a reconciliation of any increased or decreased costs to construct, or renovate, relative to the anticipated future income streams. The test of financial feasibility as a function of the highest and best use analysis will require the development of at least one cost estimate. There has been considerable debate in the literature regarding the cost-effectiveness of "green building" centered around how to properly measure the incorporation of green design and sustainable building components, the obsolescing life-cycle of those components, and the impact that life-cycle has on the developer's return on investment. Regardless of the eventual answer, barring clear and convincing proof that either the cost to construct green buildings is less than or equal to the cost to construct conventional buildings, or that the return on investment is simply greater, demand will continue to drive supply for the near term.

The second set of tests focuses on the highest and best use of the site as improved, as compared to the ideal use identified in the "as if" vacant analysis. These are two distinctly separate analyses. The appraiser has a number of considerations to address in analyzing the existing improvements. Should the existing use continue as is? Should/could the existing use be modified in some way to make it the ideal use? Should/could the existing improvements be demolished and the site redeveloped as the ideal use? Once these questions have been answered, the appraiser is ready to undertake the valuation analysis.

SITE VALUATION

The fifth step in the valuation process requires the appraiser to develop an opinion of the value of the site. Appraisers have six techniques for developing an opinion of land value at their disposal. The most

common and most preferred method is sales comparison, where sales of similar parcels are analyzed, compared, and adjusted to provide a value indication. In situations where insufficient sales exist, and the improvements to the land are new or insignificant, market extraction can be applied. Allocation can be used in determining the value of residential subdivision lots. The land residual technique capitalizes net operating income attributable to the land and capitalizes it at a market-derived land capitalization rate to estimate the value of the land. Ground rent capitalization applies a market-derived capitalization rate to the ground rent in order to ascertain land value. And finally, subdivision development analysis utilizes yield capitalization by means of a discounted cash flow in order to develop a defensible opinion of land value.

The new construction LEED certification checklist addresses a number of factors for sustainable sites that appraisers should be aware of. In developing an opinion of value for the subject site, an appraiser might want to seek comparable sites that comply with the LEED certification site selection criteria. Accordingly, only truly substitutable sites would be analyzed. In cases where few comparables exist, adjustment should be made for these factors where possible.

THREE APPROACHES

The sixth step in the valuation process requires the appraiser to develop an opinion of the value of the subject property through application of the three approaches to value: the Cost Approach, the Market (or Sales Comparison) Approach, and the Income Approach. It is important to know that the three approaches have many overlapping aspects, which, when properly applied, serve to support and corroborate one another.

COST APPROACH

The cost approach, based upon the economic principle of substitution, is defined as a set of procedures through which a value indication is derived for the fee simple interest in the property by estimating the current cost to construct a reproduction (or replacement for) the existing structure, including entrepreneurial incentive; deducting depreciation from

the total cost; and adding the estimated land value. Adjustments may then be made to the indicated fee simple value of the subject property to reflect the value of the property interest being appraised.

Depending on the nature of the assignment, appraisers will generally employ a replacement cost analysis to assess the substitutable utility of the subject property. Comparing the replacement cost estimate from a widely recognized cost estimating service (e.g., Marshall Swift/Boeckh) to the developer's budgeted cost of constructing a green building is one way to assess the merits of the initial investment. Although this approach has been criticized, it is the most effective method for appraisers to implement, as both cost estimates can be known at the beginning of a project. An example of comparative reproduction cost estimates is presented in Figure 1. The appraiser first inputs identifying and specific quantitative and qualitative factors about the subject property.

The inputs should accurately reflect the size and quality of the subject property, and can be used to analyze the architect's or builder's cost estimations so that the appraiser can arrive at a defensible value conclusion. The value estimation breaks down the subject property into elements of the basic structure, extras (i.e., site improvements), entrepreneurial incentive,¹¹ depreciation,¹² and land value.

An example conventional building cost analysis is presented in Figure 2.

Prudence dictates that an appraiser should confer with the architect, engineer, and builder when developing a discriminatory analysis between green and conventional building alternatives.

When possible, a retrospective cost analysis would allow an appraiser to compare the actual cost of construction with the replacement cost new estimate to determine if a differential existed. Barring the existence of an architect's or general contractor's construction cost budget estimate, an appraiser might use the quantity survey method to attempt to isolate the impact of green design. In this case, one cost estimate will produce an indication of the conventional replacement cost new, while another will produce an indication of the replacement cost as if green. The differential between the two would capture the additional cost to go green. However, great

FIGURE 1.

Marshall & Swift - SwiftEstimator Commercial Estimator - Summary Report

General Information

Estimate ID:	Green	Date	8/25/2008
Property Owner:	Green Tower	Created: Date	
Property Address:	111 Green Street Greenville, FL	Updated: Date	8/25/2008
		Calculated:	
Local Multiplier:		Cost Data As Of:	Aug-08

Section 1

Area	250500		Overall	
Stories in Section	10		Depreciation %	
Stories in Building	10		Physical	
Shape	rectangular		Depreciation %	
Perimeter	(auto-calc)		Functional	
Effective Age	2		Depreciation %	
			External	
			Depreciation %	
Occupancy	%	Class	Height	Quality
344 Office Building	100	A	10	2
Total Percentage	100			
	%/Units	Quality	Depr%	Other
System : Elevators				
651 Elevators : Passenger #	8	Occ.		10
652 Elevators : Freight Power #	1	Occ.		10
System : Exterior Walls				
843 Exterior Walls : Curtain- Concrete & Glass Panels	100	Occ.		
Total % for system :	100			
System : HVAC (Heating)				
628 HVAC (Heating) : Control Atmos., High-Precise	100	Occ.		1
Total % for system :	100			
System : Land and Site				
61 Land and Site : Land	20000000	Occ.		
62 Land and Site : Site Improvements	7500000	Occ.		
System : Miscellaneous				
764 Miscellaneous : Fire Alarm System	100	Occ.		
System : Sprinklers				
682 Sprinklers : Dry Sprinklers	100	Occ.		
Total % for system :	100			

FIGURE 2.

Commercial Estimator- Summary Report- Conventional					
	Units	Unit Cost	Total Cost New	Less Depreciation	Total Cost Depreciated
Basic Structure					
Base Cost	250,500	84.02	21,047,010	210,470	20,836,540
Exterior Walls	250,500	24.27	6,079,635	60,796	6,018,839
Heating & Cooling	250,500	16.7	4,183,350	41,834	4,141,516
Elevators	9	197,471.78	1,777,246	17,772	1,759,474
Sprinklers	250,500	2.29	573,645	5,736	567,909
Fire Alarm System	100	1.42	142	1	141
Basic Structure Cost	250,500	134.38	33,661,028	336,609	33,324,419
Extras					
Site Improvements - Depreciated			7,500,000	75,000	7,425,000
Entrepreneurial Incentive			20,700,000		
Replacement Cost New	250,500	246.95	61,861,028		
Less Depreciation					
Physical & Functional	1.00%			618,610	61,242,418
Depreciated Cost	250,500	244.48		411,609	61,242,418
Miscellaneous					
Land			20,000,000		20,000,000
Total Cost	250,500	326.79	81,861,028	411,609	81,242,418
Rounded					81,240,000

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care must be taken in the depreciation of any green components as some reports indicate that many of these components have had less than originally anticipated useful lives. No doubt, material sciences advancements and innovation in this area will eventually overcome the issue, but until such time great care must be taken by appraisers to accurately support and disclose their judgments in these matters.

A cost summary of the subject property as if green is presented in Figure 3.

Several studies on the subject have concluded that cost premiums for building new product green range from less than 1% to less than 12% over conventional construction costs, depending upon the level of certification sought. In this example, the rounded cost difference is only 1.03%. Reportedly, much of the increased cost for new construction is offset through incentives including expedited permitting,

density bonuses, rebates, and tax abatements; however, the evidence is far less certain about retrofitting existing structures.

SALES COMPARISON APPROACH

The sales comparison approach, also based on the economic principle of substitution, is defined as the process of deriving a value indication for the subject property by comparing similar properties that recently sold with the property being appraised, identifying appropriate units of comparison, and making adjustments to the sale prices (or unit prices, as appropriate) of the comparable properties based on relevant, market-derived elements of comparison. The sales comparison approach may be used to value improved properties, vacant land, or land being considered as though vacant when an adequate supply of comparable sales is available. If sufficient market

FIGURE 3.

Commercial Estimator- Summary Report- Green					
	Units	Unit Cost	Total Cost New	Less Depreciation	Total Cost Depreciated
Basic Structure					
Base Cost	250,500	85.61	21,445,305	214,453	21,230,852
Exterior Walls	250,500	24.73	6,194,865	61,949	6,132,916
Heating & Cooling	250,500	17.02	4,263,510	42,635	4,220,875
Elevators	9	201,197.78	1,810,780	18,108	1,792,672
Sprinklers	250,500	2.33	583,665	5,837	577,828
Fire Alarm System	100	1.44	144	1	143
Basic Structure Cost	250,500	136.92	34,298,269	342,983	33,955,286
Extras					
Site Improvements - Depreciated			7,500,000	75,000	7,425,000
Entrepreneurial Incentive			20,700,000		
Replacement Cost New	250,500	249.49	62,498,269		
Less Depreciation					
Physical & Functional	1.00%			417,983	62,080,286
Depreciated Cost	250,500	247.83		417,983	62,080,286
Miscellaneous					
Land			20,000,000		20,000,000
Total Cost	250,500	329.33	82,498,269	417,983	82,080,286
Rounded					82,080,000

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data exists, regression analysis of green product versus non-green product sales prices might yield additional support for a premium, or discount, to the market value estimate. Great care must be taken by appraisers in selecting comparable properties to subject to this analysis. Meaningful application of the sales comparison approach requires sufficient recent, reliable transactions of properties very similar to the subject such that value patterns or trends in the market can be identified.

Financial (sale-related) and physical data are arrayed for comparative analysis, along with actual economic data for the subject property and the comparables. Variations in the data explain differences in the resulting valuation metrics that must be persuasively articulated by the appraiser in developing a meaningful, defensible opinion of value. Appraisers can and should identify in their reports what level of certification, if any, comparable properties have achieved. Accurate identification will be extremely pertinent

in analyzing market extracted economic data in this approach, as well as justifying the pro forma expense rates applied in the income approach. Market participants trading in investment-grade real estate are primarily concerned with the anticipated income stream. Analyzing the differences in rental rates, occupancy levels, and expense rates between conventional and green buildings will provide appraisers with anecdotal evidence to support adjustments in the sales comparison approach and forecasts in the income approach. Data in the Figures 4, 5, 6, and 7 is adequate to support an adjustment to the comparables for more efficient utilities based on degree of greenness. The conventional building's utility expense is clearly the highest of the sample; the Energy Star buildings are more efficient, but not as efficient as the LEED certified comparable properties.

A detailed narrative explanation for each adjustment will necessarily accompany the tables in the report. Discussion regarding any clear differences

FIGURE 4.

Sales Comparison Adjustment Grid						
Sale ID	Subject	1	2	3	4	5
Financial Data						
Sale Date		7/15/2008	3/2/2008	12/13/2007	5/27/2007	1/4/2008
Sale Price	\$	105,670,000	\$ 65,750,000	\$ 92,500,000	\$ 85,500,000	\$ 104,000,000
Official Records Book/Page		12312/202	12251/011	12111/052	12056/356	12001/1C
Seller		ABC LLC	DEF LLC	GHI Inc	JKL LLP	MNO JV
Buyer		PQR LLC	STU LLC	VWX Inc	YZ1 JV	234 LLC
Physical Data						
Name	Green Tower	Yellow Tower	Blue Tower	Red Tower	Brown Tower	White Tower
Address	111 Green St	123 Yellow Av	222 Blue Blvd	357 Red Road	321 Brown Blvd	777 White Way
City	Greenville	Greenville	Greenville	Greenville	Greenville	Greenville
State	FL	FL	FL	FL	FL	FL
Year Built	2006	2006	2005	2005	2004	2002
Size (SF NRA)	250,500	325,000	220,000	260,000	250,000	300,000
Floors	10	12	10	11	12	9
Occupancy Rate	95%	97%	94%	96%	98%	93%
Certification	Silver	EnergyStar	LEED	Conventional	Silver	EnergyStar

FIGURE 5.

Sales Comparison Adjustment Grid							
Sale ID	Subject	1	2	3	4	5	
Certification	Silver	EnergyStar	LEED	Conventional	Silver	EnergyStar	
Economic Data							
Potential Gross Income	\$	35.75	\$ 35.55	\$ 35.62	\$ 35.50	\$ 36.25	\$ 36.52
Concessions	\$	1.00	\$ 1.02	\$ 1.01	\$ 1.05	\$ 0.96	\$ 0.92
Effective Gross Rent	\$	34.75	\$ 34.53	\$ 34.61	\$ 34.45	\$ 35.29	\$ 35.60
Vacancy & Collections Losses	\$	1.74	\$ 1.73	\$ 1.73	\$ 2.01	\$ 1.76	\$ 1.78
Effective Gross Income	\$	33.01	\$ 32.80	\$ 32.88	\$ 32.44	\$ 33.53	\$ 33.82
Taxes	\$	5.08	\$ 5.09	\$ 5.07	\$ 5.09	\$ 5.08	\$ 5.06
Insurance	\$	0.96	\$ 0.95	\$ 0.96	\$ 0.98	\$ 0.97	\$ 0.96
Utilities	\$	2.55	\$ 2.76	\$ 2.65	\$ 2.95	\$ 2.56	\$ 2.74
CAM	\$	2.97	\$ 2.98	\$ 2.95	\$ 2.93	\$ 2.89	\$ 2.93
Other	\$	2.33	\$ 2.30	\$ 2.39	\$ 2.38	\$ 2.32	\$ 2.31
Total Operating Expenses	\$	13.89	\$ 14.08	\$ 14.02	\$ 14.33	\$ 13.82	\$ 14.00
Net Operating Income	\$	19.12	\$ 18.72	\$ 18.86	\$ 18.11	\$ 19.71	\$ 19.82
Unadjusted Value Metrics							
\$/Square Foot of Net Rentable Area	\$	325.14	\$ 298.86	\$ 355.77	\$ 342.00	\$ 346.67	
Gross Income Multiplier		9.42	8.64	10.33	9.69	9.74	
Effective Gross Income Multiplier		9.91	9.09	10.97	10.20	10.25	
Net Income Multiplier		17.37	15.85	19.64	17.36	17.49	

between the comparables' and the subject property's income, occupancy, and expense rates cannot be understated, especially where the differences between conventional and green buildings are concerned. Appraisers must always be cautious to avoid overstating or understating the underlying assumptions of the valuation analysis. In this case, the two Silver LEED certified buildings have comparable util-

ity expense rates. That conclusion is supported by the slightly higher rates evidenced for the two basic LEED certified buildings. Arguably, a basic LEED certified building should be less energy efficient than a LEED Silver certified building; of course, the appraiser should make the effort to verify and document such an assertion in the report. Once verified, application of an adjustment in the sales comparison

FIGURE 6.

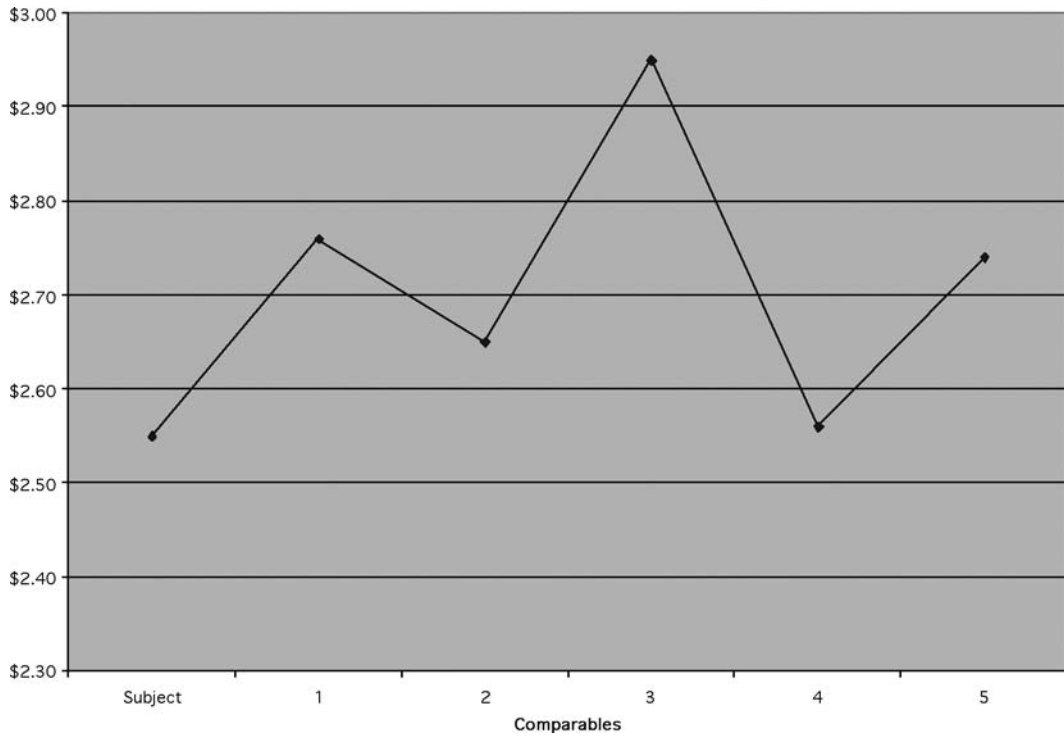


FIGURE 7.

Sales Comparison Adjustment Grid						
Sale ID	Subject	1	2	3	4	5
Certification	Silver	EnergyStar	LEED	Conventional	Silver	EnergyStar
Adjustments						
Property Rights Conveyed		Similar	Similar	Similar	Similar	Similar
Financing		Similar	Similar	Similar	Similar	Similar
Conditions of Sale		Similar	Similar	Similar	Similar	Similar
Post Sale Expenditures		Similar	Similar	Similar	Similar	Similar
Market Conditions		Similar	Similar	Superior	Superior	Superior
Location		Similar	Similar	Similar	Similar	Similar
Physical Characteristics		Similar	Similar	Similar	Similar	Similar
Economic Characteristics		Similar	Inferior	Superior	Superior	Superior
Use		Similar	Similar	Similar	Similar	Similar
Non-realty Components		Similar	Similar	Similar	Similar	Similar
Adjusted Price/ SF NRA	\$	325.00 \$	330.00 \$	335.00 \$	325.00 \$	335.00 \$
Adjusted GIM	\$	9.40 \$	8.60 \$	9.00 \$	9.00 \$	9.00 \$
Adjusted EGIM	\$	9.90 \$	9.00 \$	10.00 \$	9.90 \$	9.90 \$
Adjusted NIM	\$	17.40 \$	16.00 \$	17.50 \$	17.00 \$	17.00 \$
Subject Property Value Indications						
		Metric	Conclusion	Indicated Value		
Price Per SF NRA	\$	330.00		82,670,000		
GIM		9.2		82,390,000		
EGIM		10		82,700,000		
NIM		17.2		82,390,000		

approach and a lower than market expense rate in the income approach is suddenly defensible.

This kind of variance analysis can and should be applied to all significant inputs; however, unless quantifiably provable, appraisers should only apply qualitative adjustments to the comparables. The idea is to adjust each comparable for differences from the subject, compensating for the differences, in order to develop an approximate substitutable value indication for each selected comparable. In addition to price per square foot of net rentable area, we have also compared three economic metrics: gross income multiplier,¹³ effective gross income multiplier,¹⁴ and net income multiplier.¹⁵ Technically, these are direct capitalization analyses; the multipliers are reciprocal capitalization rates. The income, rate, and value relationship is therefore interrelated, and should be supportive of that found in the income approach. This comparison is typically treated in the sales comparison approach because the indicators are extracted from the market in this analysis.

At this point in the analysis, the appraiser has developed four different, but independently reinforcing, value indications that will eventually be reconciled. The reconciliation may be appropriately addressed either at the conclusion of the sales comparison section of the report or in the reconciliation section.

INCOME APPROACH

The income approach, based on the economic principle of anticipation, is defined as an analysis of the property's capacity to generate future benefits, capitalizing the income into an indication of present value. Data gathered from the market analysis will be used to support the underlying assumptions employed in this approach. The income approach can be employed using two distinct techniques. Direct capitalization is a technique that converts the estimate of a single year's estimated income into an indication of value in one direct step, either by dividing the net income estimate by an appropriate capitalization rate, or by multiplying the income estimate by an appropriate multiple. Yield capitalization is used to convert future benefits, typically a periodic income stream and reversion, into present value by discounting each of the periodic future benefits at an appropriate yield rate, or by applying an overall rate to explicitly reflect the investment income pattern, change in value,

and yield rate. Most investment grade properties are analyzed using the discounted cash flow method, although many appraisers will use both techniques. As stated earlier, thorough analysis and support of each input item is critical to creating a reliable model. An example of a discounted cash flow analysis is presented in Figure 8.

Discounted cash flow analysis is a complicated matrix of critical underlying assumptions that should be tested for sensitivity to various inputs if it is to be a reliable tool. Analyzing the impact of sustainable construction and green building in the valuation process is still in its infancy, but proper technical execution of the valuation methodology is well defined. That said, until users of appraisal reports begin to ask, and pay for, appraisers to provide evidence for any value enhancement resulting from green building, the greening of America will be slow.

An important, and as yet unresolved, question remains: are the financial rewards for building green sufficient to induce entrepreneurs to undertake the unproven risks of building green? For developers, the potential for decreased regulatory friction during the process is appealing, but longer project completion times can easily cancel out those benefits. Time equals risk in the development game and unforeseen project delays have crippled many conventional projects over the years. Of course, credits and incentives accruing to the project as a result of LEED certification may offset increased construction costs while reducing long term operating costs. Clearly, this scenario will be appealing to owner operators, but the rewards may be insufficient for merchant builders. For now, these cost/benefit relationships will have to be analyzed on a case-by-case basis, but no doubt, as green building becomes more mainstream, the risks will decrease.

It cannot be overemphasized that until such time as reliable survey and transaction data exists, anecdotal evidence will be all that appraisers will be able to document and employ in valuation reports. Even if increased rental and occupancy rates and lower utility expenses relative to conventional projects can be achieved by green buildings, who will be the ultimate beneficiary still remains unclear. If demand outstrips supply, the residual will certainly flow to the investors; but if supply significantly exceeds demand, tenants may be the ultimate financial winners.

FIGURE 8.

Income Capitalization Approach: Discounted Cash Flow Analysis									
111 Green St, Greenville, FL 250,500SF NRA									
Year			1	2	3	4	5	6	
Revenue									
Potential Gross Income	\$ 35.75		\$ 8,955,375	9,224,036	9,500,757	9,785,780	10,079,353	10,381,734	
Concessions	\$ 1.00		\$ 250,500	258,015	265,755	273,728	281,940	290,398	
Effective Gross Rent	\$ 34.75		\$ 8,704,875	8,966,021	9,235,002	9,512,052	9,797,414	10,091,336	
Vacancy & Collections Losses	\$ 1.74		\$ 435,244	448,301	461,750	475,603	489,871	504,567	
Effective Gross Income	\$ 33.01	100%	\$ 8,269,631	8,517,720	8,773,252	9,036,449	9,307,543	9,586,769	
Expenses									
Taxes	\$ 5.08	15%	\$ 1,272,540	1,310,716	1,350,038	1,390,539	1,432,255	1,475,223	
Insurance	\$ 0.96	3%	\$ 240,480	247,694	255,125	262,779	270,662	278,782	
Utilities	\$ 2.55	8%	\$ 638,775	657,938	677,676	698,007	718,947	740,515	
CAM	\$ 2.97	9%	\$ 743,985	766,305	789,294	812,972	837,362	862,483	
Other	\$ 2.33	7%	\$ 583,665	601,175	619,210	637,787	656,920	676,628	
Total Operating Expenses	\$ 14.10	43%	\$ 3,479,445	3,583,828	3,691,343	3,802,083	3,916,146	4,033,630	
Net Operating Income	\$ 18.91	57%	\$ 4,790,186	4,933,892	5,081,909	5,234,366	5,391,397	5,553,139	
Terminal Capitalization		5.50%					98,025,397		
Net Cash Flow			\$ 4,790,186	4,933,892	5,081,909	5,234,366	103,416,794		
			Indicated Value						
Discount Rate (IRR)		8.75%	\$84,260,000						
		9.00%	\$83,390,000						
		9.25%	\$82,540,000						
		9.50%	\$81,690,000						
		9.75%	\$80,860,000						

RECONCILIATION

The seventh step in the valuation process requires the appraiser to develop a reconciliation of the value indications from the three approaches to value and to settle on a final opinion of value. Most all appraisal reports will develop more than one opinion of value through the application of one or more of the three approaches to value (Figures 9–12). It is common practice to develop both a direct capitalization analysis and discounted cash flow analysis in the income approach that will need to be reconciled. Several different units of measure may be analyzed in the sales comparison approach, typically rendering different value indications that need to be reconciled. Likewise, the cost approach could generate more than one opinion of value through the application of more than one of the three techniques. Some appraisers will reconcile differing indications at the conclusion of each of the three approaches, while others prefer to perform all reconciliations at the end of the report. Regardless, the final opinion of value should form a credible, defensible, meaningful final conclusion that

is supported by the accuracy and quantity of data gathered in the market analysis and the appropriate application of the selected approaches to value utilized in the report. When properly developed, provided sufficient market evidence exists, an appraisal report is internally reinforcing and value conclusions correlate in a statistically significant range.

As stated earlier, it is possible to develop several different value indications within each of the three approaches. In this example, the appraiser has developed reproduction cost estimates of the subject property assuming both green and conventional construction (Figure 9). In addition, the appraiser has been provided the architect’s cost estimate and the general contractor’s cost estimate (i.e., quantity survey method value indication) that corroborate his conclusions. The appraiser is then able to reconcile each, to determine a green premium via the cost approach. As expected, it is slightly more expensive to develop a green building.

In the sales comparison approach (Figure 10), the appraiser has developed four value indications

FIGURE 9.

Cost Approach Reconciliation	
Reproduction Cost - Conventional	81,240,00
Reproduction Cost - Green	82,080,00
Architect's Cost Estimate	81,950,00
Quantity Survey Method	82,150,00
Reconciled Indication - Conventional	81,240,00
Reconciled Indication - Green	82,000,00
Green Premium	760,000

for both conventional and green product. The value indications for the conventional product are reconciled to a single conclusion, as are the value indications for the green product. The rationale for the reconciled indications must be thoroughly articulated in the appraisal report. Development of value indications for both conventional product and green product allow the appraiser to isolate the green premium. In the sales comparison approach the green premium represents the amount that market participants are willing to exchange for green product over conventional product. As long as user/tenant demand exceeds supply a green premium should exist, but the only way to isolate the premium is to conduct a comparative valuation analysis.

Similarly, the appraiser is required to develop income approach indications of the value of the subject property as conventional and green product (Figure 11). In this instance the appraiser has developed value indications via both the direct capitalization and discounted cash flow techniques. By doing so the appraiser is again able to isolate a green premium.

If the appraiser has conducted a thorough market analysis, it should be possible to explain why higher rents and occupancy rates should be achieved in the local market (e.g. due to limited supply and high tenant demand for socially responsible space). For the same reasons the appraiser should also be able to justify lower operating expenses.

In the final reconciliation (Figure 12) the appraiser typically expresses the value of the subject property as a single value in U.S. dollars as of a specific date and pursuant to a specific definition of value.

Although oral reports are permitted under USPAP, appraisal reports are typically narrative works and frequently contain all necessary data to explain and support the appraiser's conclusions.

FIGURE 10.

Sales Comparison Approach Reconciliation	
Conventional:	
Adjusted Price/ SF NRA	81,125,00
Adjusted GIM	81,100,00
Adjusted EGIM	81,550,00
Adjusted NIM	81,450,00
Reconciled Indication	81,250,00
Green:	
Adjusted Price/ SF NRA	82,670,00
Adjusted GIM	82,390,00
Adjusted EGIM	82,700,00
Adjusted NIM	82,390,00
Reconciled Indication	82,400,00
Green Premium	1,150,000

FIGURE 11.

Income Approach Reconciliation	
Direct Capitalization - Conventional	80,750,00
Discounted Cash Flow - Conventional	81,150,00
Reconciled Indication	81,000,00
Direct Capitalization - Green	81,750,00
Discounted Cash Flow - Green	82,540,00
Reconciled Indication	82,000,00
Green Premium	1,000,000

FIGURE 12.

Final Reconciliation	
Conventional Construction Value	81,250,00
Green Building Value	82,000,00
Green Premium	750,000

CONCLUSION

Investment analysts and real estate appraisers will be increasingly called upon to demonstrate the financial feasibility, or infeasibility, of "green" building on a project-by-project basis. The responsibility will fall to appraisers to validate the marginal contribution assertion, especially in the near term. And as with most markets, the greatest premiums will be garnered by those who successfully implement a consumer-accepted innovation first. Appraisers who learn to discriminate and articulate the value enhancement of green building over conventional construction now will reap substantial rewards as increasing numbers of market participants demand

verification. Users of appraisal reports must realize that isolating the green premium requires substantially greater effort than is necessary in a typical valuation report and must be prepared to compensate appraisers accordingly.

NOTES

1. http://www.deloitte.com/dtt/press_release/0,1014,sid%253D2283%2526cid%253D218543,00.html.
2. <http://www.usgbc.org/>.
3. <http://www.costar.com/News/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679>.
4. https://www.rreef.com/GLO_en/bin/SO_57_Greening_of_US_Investment_RE.pdf.
5. <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=220>.
6. http://www.energystar.gov/index.cfm?c=about.ab_history.
7. <https://www.wellsfargo.com/about/csr/ea/>.
8. <http://www.greenbuildingsnyc.com/2008/02/19/green-construction-law-as-legislation-proliferates-and-insurance-issues-emerge-is-green-building%E2%80%99s-future-being-compromised/>.
9. http://www.appraisalfoundation.org/s_appraisal/index.asp.
10. <http://www.kc.frb.org/banking/references/regulatoryupdate-seminar/2008/AttachmentG.pdf>.
11. Entrepreneurial incentive is a market-derived estimate that represents the amount an interpreter expects to receive for his or her contribution to a project to compensate for his or her risk associated with the project.
12. Depreciation, in appraisal jargon, is the difference between the market value of the improvement and its reproduction or replacement cost at the date of valuation, and should not be confused with the accounting term. Depreciation estimates in this analysis are calculated based on the Marshall Swift depreciation database.
13. The gross income multiplier is the ratio between the sale price of a property and its gross income.
14. The effective gross income multiplier is the ratio between the sale price of a property and its effective gross income.
15. The net income multiplier is the ratio between the sale price of a property and its net income.

REFERENCES

- Appraisal Institute. 2008. *The Appraisal of Real Estate 13th Ed.*
- Fanning, Stephen F. 2005. *Market Analysis for Real Estate, Concepts and Applications in Highest and Best Use.* Appraisal Institute.
- Kibert, Charles J. 2008. *Sustainable Construction: Green Building Design and Delivery, Second Edition.* John Wiley & Sons, Inc.
- Ling, David C. and R. Wayne Archer. 2005. *Real Estate Principles, A Value Approach.* McGraw Hill Irwin.
- Lusht, Kenneth M. 2001. *Real Estate Valuation, Principles and Applications.* KML Publishing.
- Urban Land Institute, *Urban Land Green magazines*, ULI.