We’ll be starting in just a few minutes….

Tell us…please send your response to the webinar organizers via the question box:

What topics are you interested in for future webinars?
Valuing Energy Efficiency: Considering Energy Performance in Real Estate Appraisals and Valuation

March 1, 2016
3:00-4:00 PM ET
Overview and Agenda

- Welcome & Introductions
- Presentations
  - Colliers International and Inspyrod
  - Sustainable Values
- Additional Resources
- Question & Answer Session
# Today’s Presenters

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tr>
<td>John K. Scott</td>
<td>Colliers International</td>
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<tr>
<td>Devesh Nirmul</td>
<td>Inspyrod</td>
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<tr>
<td>Theddi Wright Chappell</td>
<td>Sustainable Values</td>
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John K. Scott, Colliers International and Devesh Nirmul, Inspyrod
High Performance Building Value Creation
March 1st 2016
Reconciling High-Performance Benefits with Valuation Impacts in the Marketplace
Traditionally, **present value (PV)** is the value of a future asset expressed in present dollars. This is done by discounting future income or revenue. There are a variety of formulas for PV, including the most common formula for lump sums, in which \( n \) is the number of periods and \( i \) is the interest or discount rate:
Net Present Value

NPV is the net investment costs from the after-tax present value of project savings. This can be represented with the following formula:

Net Present Value  =  Present Value − Investment Cost
NPV  =  PV − I
Net Operating Income =

Potential Leasing Income
– Anticipated Vacancy and Credit Losses
+ Any Other Income
– Operating Expenses
When ROI is greater than the capitalization rate, the project is considered worthwhile. In its most simple form:

\[ ROI = \frac{Gains - Cost}{Cost} \]
Reduced Energy Cost

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<tr>
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</thead>
<tbody>
<tr>
<td>Rental Growth for non-Green</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-1.50%</td>
</tr>
<tr>
<td>Rent Premium for Green</td>
<td>3.00%</td>
<td>6.10%</td>
<td>-</td>
<td>-</td>
<td>3.00%</td>
<td></td>
</tr>
<tr>
<td>Energy Star</td>
<td>-</td>
<td>-</td>
<td>2.80%</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>LEED</td>
<td>-</td>
<td>-</td>
<td>0.30%</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Energy Star/LEED</td>
<td>-</td>
<td>-</td>
<td>11.80%</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Effective Rent</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6.00%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Decrease Operating Expenses</td>
<td>8.00-9.00%</td>
<td>13.60%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Reduction cap rate</td>
<td>-</td>
<td>-</td>
<td>25-50 BP</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Improved ROI</td>
<td>6.60%</td>
<td>9.90%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Increase occupancy ratio</td>
<td>3.50%</td>
<td>6.40%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Market value</td>
<td>7.50%</td>
<td>10.90%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Selling price</td>
<td>-</td>
<td>-</td>
<td>5.76%</td>
<td>10.00%</td>
<td>16.00%</td>
<td></td>
</tr>
<tr>
<td>Energy Star</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10.00%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>LEED</td>
<td>-</td>
<td>-</td>
<td>9.94%</td>
<td>31.00%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Energy Star/LEED</td>
<td>-</td>
<td>-</td>
<td>11.40%</td>
<td>-</td>
<td>-</td>
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</table>

Capitalization Rate

Find the capitalization rate by dividing a building’s net operating income by its appraisal value or sales price. Capitalization rates commonly fall between 6% and 10%.

\[
\text{Capitalization Rate} = \frac{\text{net operating income}}{\text{appraisal or sales value}}
\]
Sales Comparison

Sales Comparison Method
Categories

- Financing terms
- Location
- Physical characteristics
- Personal property
- Market conditions
HIGH-PERFORMANCE INVESTMENTS THAT DEMONSTRATE VALUE IN AN INCOME ANALYSIS WILL EITHER REDUCE OPERATING COSTS OR INCREASE REVENUE
Capitalization Rate

If a $100,000 chiller replacement is proposed, the cost would be the initial price of the new equipment, $100,000. Gains would be anticipated savings. These might include a rebate of $10,000, a $1,000 annual reduction of maintenance costs over the 25-year lifetime, and a smaller utility bill due to energy savings of $5,000 annually. ROI could then be projected over the lifetime of the product as shown:

Investment Cost $100,000
Gains
$10,000 (rebate)
$1,000 x 25 years (reduced maintenance)
$5,000 x 25 years (reduced energy costs)

\[
ROI = \frac{10,000 + 25,000 + 125,000}{100,000} = 1.6, \text{ or } 160\%
\]

ROI can also be calculated for the first year of ownership.

\[
ROI = \frac{10,000 + 1,000 + 5,000}{100,000} = 0.16 \text{ (or 16%)}
\]
Case Example

Building A

Potential Leasing Income (Full Occupancy) $200,000
Average vacancy and credit losses – 10%
Additional Parking Revenue + $5,000
Operating Expenses – $100,000

Net Operating Income = $85,000

If the NOI equals $85,000 with an appraisal value of $950,000:

\[
\text{Capitalization Rate} = \frac{\text{Net Operating Income}}{\text{Market Value}} = \frac{85,000}{950,000} = 0.0895, \text{ or } 8.95\% 
\]
<table>
<thead>
<tr>
<th>Income Approach</th>
<th>Pre-Upgrade Value (10% cap rate)</th>
<th>High Performance Value (10% cap rate)</th>
<th>Improvement in Value</th>
</tr>
</thead>
</table>
| **Energy Efficiency Only Scenario** (Energy efficiency improvements that result in a 30% reduction in overall operating expenses) | Gross income: 150K  
Adjusted gross income (assuming 5% vacancy/losses): 142.5K  
Operating expenses: 70.0K  
Value: 725K | Gross income: 150K  
Adjusted gross income (assuming 5% vacancy/losses): 142.5K  
down Operating expenses: 49K  
up Value: 935K | 210K |
| **Energy Efficiency + Increased Occupancy** (Increased Occupancy Rate Impacts based on tenant demand for green certified spaces) | Same as above | Gross income: 150K  
up Adjusted gross income (assuming 3% vacancy/losses): 145.5K  
up Operating expenses: 51K  
Value: 945K | 220K |
Life cycle analysis (LCA) enables a full and fair measurement of high-performance investments. It does so by balancing the upfront costs against savings and benefits that accrue over the lifetime of the investment. The life cycle approach of analysis ensures that investments are adequately valued for their impact over the useful life of the investment.
Status Quo vs High-Performance investments: Life-Cycle Impacts on Net Savings over 5 year period

- Hi-Perf HVAC Replacement: 405 K
- Standard-Perf HVAC Replacement: 377 K
- HVAC Tune-up only (replacement required Yr 5): -31 K

- Year 1
- Year 2
- Year 3
- Year 4
- Year 5
<table>
<thead>
<tr>
<th>Upgrade / Value Impact Considerations</th>
<th>Revenue</th>
<th>Expenses (Energy, Water + Labor)</th>
<th>Gross Lease Rates</th>
<th>Capital Funds Required</th>
<th>Asset Hold Period (&lt; 5yrs)</th>
<th>Asset Hold Period (&gt; 10 yrs)</th>
<th>NOI Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major HVAC Equipment: 20 – 25 yr life-cycle</td>
<td>↓</td>
<td>↓ (More competitive by minimizing operating costs)</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>HVAC Equipment Recommissioning: 5 – 10 yr life-cycle</td>
<td>↓</td>
<td>↓</td>
<td>Low/Medium</td>
<td>Maybe</td>
<td>Yes</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>Lighting Upgrade 5 – 10 yr life-cycle</td>
<td>↓</td>
<td>↓</td>
<td>Low / Medium</td>
<td>Yes</td>
<td>Yes</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>Thermal Mass Storage Modeling + Economic Demand Response: perpetuity</td>
<td>↑</td>
<td>-</td>
<td>Medium (market dependent)</td>
<td>Maybe</td>
<td>Yes</td>
<td>↑</td>
<td></td>
</tr>
<tr>
<td>LEED Certification</td>
<td></td>
<td></td>
<td></td>
<td>No</td>
<td>Yes (future demo-graphics or tenants)</td>
<td>↑</td>
<td></td>
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</tbody>
</table>
Other factors to consider in a life cycle analysis include the end-of-useful-life costs such as decommissioning and disposal. The BOMI International course Real Estate Investment and Finance provides an LCA worksheet and guidelines.
Sequenced Steps for Assessing, Calculating and Valuating High-Performance Investments Part 1

### Collect Baseline Cost and Consumption Data
- Work effectively with the facility team, engineering vendors, and others, in order to generate relevant and quality data for use in a valuation analysis.
- Ex. Utility energy audit data that provides current annual energy consumption (kWh and kW) and cost ($) of running old chiller (business as usual).

### Review and Adopt the Investor’s Performance Criteria
- How does the investor calculate financial performance: ROI, NPV, IRR; what discount are the preferred discount rates, etc.
- Insist that engineers and vendors comply with ROI type parameters (ex. Property hold period, payback criteria) of the investment decision maker and utilized industry standard engineering calculations ex. ASHRAE/ASHRAE guidelines / templates for Energy Audits.

### Collect High-Performance Scenario Cost and Consumption Data
- Working with the facility team, engineering, product vendors and others determine costs, savings and benefits of high-performance investments.
- Ex. Vendor equipment cost quotes and energy savings estimates (kWh, kW and $) for a chiller upgrade (high-performance scenario).

### Utilize available tools to generate cost and savings outputs to be plugged into the valuation analysis
- Take the raw baseline and high-performance data along with investor’s financial metric preferences and plug the data and parameters into existing government (ex. EERE Energy and Cost Savings Calculator, Energy Star’s CPCS, FVC and BUVC, etc.) and 3rd Party calculators to determine energy cost and savings estimates for high-performance vs business as usual scenarios for both single and bundled groups of investments and the inclusion of life-cycle impacts.
Sequenced Steps for Assessing, Calculating and Valuating High-Performance Investments Part 2

- Calculate the quantitative impacts of tangible high-performance investment benefits
  - You may try several calculators, play around with discount rates or various bundled and life-cycle scenarios so as to have several options available for matching specific calculation scenarios with specific market-based conditions that either justify a higher or lower premium on high performance
  - Consider the Impact of Split-Incentives whereby an investment creates benefits for other stakeholders and may dis-incentivize an investor unless benefits are revenue-recoverable

- Estimate, indirectly derive or identify the quantitative impacts of intangible high-performance investment benefits
  - Utilize proxy indicators for value ex. correlation of high-performance with tenant satisfaction or reduced # of comfort calls, sustainability brand recognition within city

- Translate how high-performance financial outputs impact the standard industry valuation approaches
  - Articulate the breadth of Public, Intangible and Tangible benefits and address owner-tenant split-incentives
  - Integrate calculation outputs into relevant building valuation approaches: Cost Depreciation, Income and Sales
  - Value Alignment: Qualify, Weight and Adjust values to reflect market and investor perspectives

- Ensure and communicate measurement and verification procedures in advance of implementation of high-performance features / investments to ensure maximum performance potential
Theddi Wright Chappell

Sustainable Values
“We know the price of everything and the value of nothing……”
- Oscar Wilde, Picture of Dorian Gray (1890)

What the Market Values = Market Value (MV)
Excellent Valuation “Primer”

- Covered the technical aspects of a valuation well
- Touched on many of the salient points
  - Issue of feasibility on various systems that could impact H&B Use/MV
  - Challenges with Sales Comparison
  - Reduction in expenses could increase NOI and value
  - Need for life cycle cost analysis
Challenges Facing Appraisers

- Heavy reliance on market and empirical data
  - Issue of confidentiality
  - Investors looking for “financial validation” have found data insufficient to date
- Changing perceptions of “value” and “performance”
- Vernacular and principles previously not considered in the U.S., neither “broader” concepts nor externalities
Market & Concepts Changing

- “Performance” is increasingly being assessed at multiple levels
  - Building level
    - Growth of Benchmarking
  - Management level
    - Continual assessment and upgrade
  - Tenant level
    - Impact on occupancy costs and work environment
Risk a Critical Factor

- Implications for Market Value are significant
- Performance perspective
- Probability perspective
- Characterization of risk
  - Market/economic
  - Environmental
  - Social
- Issue of ‘future-proofing’ investments
How Can Market Participants be More Proactive?

- Owners and investors
  - Scope of Work
  - Provide valuation professionals with the information they need
- Architects, engineers and designers
  - Provide third party reports and details about property’s special features
- Tenants
  - Understand lease options available
  - Be an “informed shopper”
Know Where You Fit in the Process

- Remember what you are trying to accomplish
  - What positive role can you play in the appraisal process?
- Know your strengths – and your limitations
  - Valuation is a field that requires experience
- Inform not influence
  - “The Market” is the final determinant of value
What’s Already Out There to Help

- **The Appraisal Foundation’s Guidelines**
  - One finalized; one under review; one coming
- **Appraisal Institute’s Green Addendums**
  - Residential and commercial
- **IMT’s various publications**
  - Provide guidance and case studies
- **DOE tools**
“We know the price of everything and the value of nothing……”
- Oscar Wilde, Picture of Dorian Gray (1890)

What the Market Values = Market Value
THANK YOU!
Additional Resources
For More Information

- High Performance Green Building – What’s It Worth?

- The Appraisal Foundation APB Advisory #6: Valuation of Green and High Performance Property Background and Core Competency
Q & A
Join us for the next Better Buildings Webinar

Registration is now open!

Strategies for Controlling Energy and Water Use in Leased Spaces

April 5, 3:00 – 4:00 PM ET

Presenters:
Cushman & Wakefield
U.S. Department of Energy
Sprint

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<th><strong>Program Support</strong></th>
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<tr>
<td>John Scott</td>
<td>Cindy Zhu</td>
<td>Kendall Sanderson</td>
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<td>Colliers International</td>
<td>DOE, Better Buildings Challenge</td>
<td>JDM Associates</td>
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