Show Me the Value: Appraising Green
Better Buildings Summit
May 10, 2016
Agenda

3:45 Welcome & Introductions
3:50 Speaker Presentations
Discussion
4:30 Audience Q&A
5:00 Adjourn
Today’s Presenters

Theddi Wright Chappell
CEO, Sustainable Values

John K. Scott
SVP of Real Estate Management Services, Colliers International

Dave Pogue
Global Director of Corporate Responsibility, CBRE

Devesh Nirmul
Senior Director, Renew Financial
Theddi Wright Chappell, Sustainable Values
The Push Pull of Energy and Property Valuation

Better Buildings Summit
May 10, 2016
Push Pull of “The Market”

- What is the role of energy in the commercial property market?

“…..the \textit{one} factor that will have the greatest impact on the real estate sector over the next decade is \textit{energy}.”

Michael Acton, North American Director of Research, AEW Capital, 2015
Push Pull of Investors

- NOI is still King
- Pull of market to be more sustainable/energy efficient is met with
  - Push back from investors
    - GAP in time of investment versus time of return cited as excuse not to move forward by many institutional investors
Push Pull of Risk Parameters

- What is the risk of incorporating energy upgrades with no immediate returns into existing properties versus holding the property for 5 to 7 years with no efficiency improvements?
GAP – Use life cycle cost analysis instead of quarterly valuations

Risk – Consider downside of not upgrading property with equal weight of upside

Review Scope of Work in valuations to see that energy efficient/sustainable strategies are being assessed
Creates the Components of Value

- “The Market” determines “Market Value”
- Investors set risk (rate) parameters they find acceptable
- Revenue performance provides income metrics

\[ \text{Value} = \frac{\text{Income}}{\text{Rate (Risk)}} \]

- If all of these are accurate, there should be no surprises or disappointments
For valuations – data is King
Lack of empirical data has proven a challenge
New DOE course addresses energy in the valuation process plus
Three DOE tools:
- Portfolio Manager
- Asset Score
- Buildings Performance Database
John Scott, Colliers International and Devesh Nirmul, Renew Financial
Valuation: The Sustainability Factor

Value Creation
- Energy Efficiency
  - ↑ NOI, Reputation
- Green Building
  - ↑ Potential Performance, Reputation
- Indoor Air Quality
  - Productivity: ↓ absenteeism + sick days; Tenant Satisfaction Surveys
- Tenant Engagement
  - Performance, Tenant Satisfaction

Value Measurement
- Energy Efficiency
  - ↑ Net Rents Performance → Income and Sales Approach
- Green Building
  - ↑ Net Rents, Occupancy → Income and Sales Approach
- Indoor Air Quality
  - Worker Productivity → Tenant Performance Satisfaction
- Tenant Engagement
  - Marketplace Differentiator, Tenant Loyalty

Value Assignment & Capture

Current /Leading
Innovative and Complex
Emerging

5 - 10K ft: Building / Asset
50K ft: Society / Global

50K ft
Path to HP Valuation + Standard Valuation Approaches

<table>
<thead>
<tr>
<th>Investment Opportunity</th>
<th>Baseline and HP Performance Data</th>
<th>Market &amp; Legislative Drivers + Differentiators</th>
<th>Investment Performance Criteria + Calculations</th>
<th>Business Case and Valuation of Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10K</strong></td>
<td><strong>5K</strong></td>
<td><strong>20 - 40K</strong></td>
<td><strong>10 - 20K</strong></td>
<td><strong>5K – 40K</strong></td>
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<table>
<thead>
<tr>
<th>Emphasizes</th>
<th>Able to Capture</th>
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<tbody>
<tr>
<td>Income</td>
<td>Operating Expenses and Revenue</td>
</tr>
<tr>
<td>Sales</td>
<td>Industry, Geographical and Market Preferences</td>
</tr>
<tr>
<td>Cost Depreciation</td>
<td>Building and Equipment Useful Life</td>
</tr>
</tbody>
</table>
What are We Valuing? How Tangible is it? Who Does it Matter to?

- High Performance Feature
- Determination of Type and Scope of Benefits
- Which Stakeholders Receive the Benefits
- Impact on Valuation Approach
- Market Validation of Value

**Energy Efficiency**
**Water Efficiency**
**Green Building Certification**
**Healthy Building Certification**

**Tangible Benefits:** Operating cost reductions
**Intangible Benefits:** Improved air quality, preference for green certified spaces

**Owner Benefits**
**Owner/Tenant Benefits**
**Tenant Benefits**
**Public Benefits**

**Sales Comparison**
**Cost Depreciation**
**Income**

- Sales Prices
- Operating Costs
- Building Value
- Basis Points
- Occupancy Rates
- Duration of vacancies
- Occupant Satisfaction

40K ft
### Empirical Validation of HP Value Impact on Key Performance Metrics

<table>
<thead>
<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>-</td>
</tr>
<tr>
<td>Rent Premium for Green</td>
<td>3.00%</td>
<td>6.10%</td>
<td>2.80%</td>
<td>-</td>
<td>3.00%</td>
<td>-1.50%</td>
</tr>
<tr>
<td>Energy Star</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>LEED</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Energy Star/LEED</td>
<td>-</td>
<td>-</td>
<td>0.30%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Effective Rent</td>
<td>-</td>
<td>-</td>
<td>11.80%</td>
<td>-</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>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Improved ROI</td>
<td>13.60%</td>
<td>9.90%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>25-50 BP</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>-</td>
<td>16.00%</td>
</tr>
<tr>
<td>Energy Star</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>LEED</td>
<td>-</td>
<td>-</td>
<td>9.94%</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Energy Star/LEED</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

**Note:** 30K ft
Building Level: Energy Efficiency and the Income Approach: OpEx, NOI, Cap Rates


20K ft
# Building Level: Income Approach Hypothetical Scenario

<table>
<thead>
<tr>
<th>Scenario</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  
Operating expenses: 49K  
↑ 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  
↑ Adjusted gross income (assuming 3% vacancy/losses): 145.5K  
↑ Operating expenses: 51K  
Value: 945K | 220K |
## Know Your Unique Situation: Value Impact Assessment

<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 Recommission-ing: 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 demographics or tenants)</td>
<td>↑</td>
<td></td>
</tr>
</tbody>
</table>
Reconciling Valuation with Investment Decisions: **5K ft**

NPV/Discount Rate, ROI, Life-Cycle Analysis, Bundling

Asset Hold Time:

- **3yrs**
  - ROI: 87.5%
  - ROI: 150%
  - ROI: 130%

- **5 yrs**
  - ROI: 231%
  - ROI: -440%

High / Low Performance Annual Nets Savings Factoring in Life-Cycle Costs and Savings (Equipment Replacement Costs, Energy Savings and Maintenance Costs)
THE BUSINESS OF GREEN
and the road ahead.

Sustainability Overview
Dave Pogue

CBRE
## INDUSTRY PROGRESSION

### THEN (2000) vs. NOW (2016)

#### EPA ENERGY STAR®
- First label for commercial building
- Fewer than 500 buildings
- No cities or states with energy disclosure regulations
- No commercial real estate firm chosen “Partner of the Year”
- More than 400,000 buildings benchmarked
- More than 25,000 labels (500 in LA, Chicago and Washington DC)
- Certification Nation – CBRE 406 buildings alone
- 14 cities/states adopting disclosure laws with more pending
- 13 real estate firms are “Partner of the Year”

#### LEED®
- First LEED certification launched for new construction
- No buildings officially certified
- No LEED AP/GA designation
- Globally recognized brand
- 4 billion sq. ft. certified in every major global market
- More than 220,000 LEED APs/GAs

#### TRANSPARENCY | REPORTING
- GRI (14 firms respond globally)
- CDP taking shape
- GRESB does not exist
- All but one S&P 500 firm reported to either GRI (3,500 firms) or CDP (6,000 firms)
- GRESB has more than 700 investment funds reporting, valued at more than $2.2 trillion
GREEN BUILDING ADOPTION INDEX

About GBAI

CHIEF OBJECTIVE:
Quantify and understand the dynamics of certified green building space in top 30 U.S. markets

LEADER:
Dr. Nils Kok, Maastricht University; in collaboration with Rogier Holtermans, Maastricht University

DATA ACQUISITION:
- USGBC
- CBRE Research

TO DATE:
- 3.5 billion sq. ft.
- 34,000 buildings
# GREEN BUILDING ADOPTION INDEX

## Expansion

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2015</th>
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<tbody>
<tr>
<td>Total sq. ft. of Green Buildings</td>
<td>5.6%</td>
<td>39.3%</td>
</tr>
<tr>
<td>Total # of Green Buildings</td>
<td>1.5%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Total sq. ft. of ENERGY STAR Labeled</td>
<td>5.1%</td>
<td>30.3%</td>
</tr>
<tr>
<td>Total # of ENERGY STAR Labeled</td>
<td>1.3%</td>
<td>10.2%</td>
</tr>
<tr>
<td>Total sq. ft. of LEED Certified</td>
<td>.40%</td>
<td>19.4%</td>
</tr>
<tr>
<td>Total # of LEED Certified</td>
<td>.14%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Total sq. ft. of LEED EB Certified</td>
<td>.11%</td>
<td>15.4%</td>
</tr>
<tr>
<td>Total # of LEED EB Certified</td>
<td>.03%</td>
<td>3.1%</td>
</tr>
</tbody>
</table>
## GREEN BUILDING ADOPTION INDEX

### Size Tranches

<table>
<thead>
<tr>
<th>Total</th>
<th>Under 100K SF</th>
<th>100-250K SF</th>
<th>250-500K SF</th>
<th>500K+ SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sq. ft. of Green Buildings</td>
<td>7.0%</td>
<td>26.4%</td>
<td>67.1%</td>
<td>76.0%</td>
</tr>
<tr>
<td>Total # of Green Buildings</td>
<td>4.5%</td>
<td>24.4%</td>
<td>54.6%</td>
<td>62.3%</td>
</tr>
<tr>
<td>Total sq. ft. of ENERGY STAR Labeled</td>
<td>5.1%</td>
<td>20.7%</td>
<td>46.8%</td>
<td>50.3%</td>
</tr>
<tr>
<td>Total # of ENERGY STAR Labeled</td>
<td>3.1%</td>
<td>19.2%</td>
<td>39.6%</td>
<td>43.5%</td>
</tr>
<tr>
<td>Total sq. ft. of LEED Certified</td>
<td>2.1%</td>
<td>8.8%</td>
<td>39.9%</td>
<td>50.7%</td>
</tr>
<tr>
<td>Total # of LEED Certified</td>
<td>1.5%</td>
<td>7.9%</td>
<td>29.0%</td>
<td>38.8%</td>
</tr>
</tbody>
</table>
Discussion
Thank you!

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