Sustainability

Sustainability – Cost or Value?

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Property Sector – Global Environmental Impacts

Buildings are responsible for 40% of world’s global greenhouse gas emissions.

Buildings are responsible for 40% of solid waste generation globally.

Buildings use 12% of the world’s water.

Air quality in buildings typically contains up to 5x more pollutants than outdoor air.

Buildings utilize 1/3 of the world’s resources.
What is a ‘green building’?
The Gauge – Bourke St, Melbourne
Sustainability in the context of the property and construction industry is realised through green building design, construction/refurbishment and operation.
The Triple Bottom Line

Economy

Social

Environmental
Sustainable buildings are designed to meet the **triple bottom line** of:

1) **Environmental Benefits**
   - Enhance and protect the ecosystem
   - Efficient usage of air and water
   - Waste reduction
   - Reduce greenhouse emissions

2) **Economic Benefits**
   - Meet energy efficiency – reduce operating cost
   - Improve employee productivity
   - Improve & optimise life cycle economic performance

3) **Social Benefits**
   - Enhance occupant comfort and health
   - Minimise strain on infrastructure
   - Improve overall quality of life
Green Buildings – Key Drivers in the Market

- Investor Demand
- Future Proofing Asset Value
- Corporations wishing to compete for Govt Tenders
- Government Leadership
- Green Lease Requirements
- Established Benchmark
- Competitive Advantage
- Tenant Demand
- Investor Value
Tenant Value – Quality Built Environment

Green Buildings – Key Challenges

1. Existing Building Stock
2. Tenants & Consumer Mindset
3. Alternate Financial Solutions
4. Business as Usual
5. Strata titled building stock
Key Strategic Questions

• What is the cost impact?

• What is the value/benefits to stakeholders?
What is the Cost Premium?

The answer depends on the level of green initiatives. Also different types of projects have different initial/capital cost impact.

Based on studies done mainly in US and Europe there are cases where green buildings are constructed at the same cost as conventional buildings.

Notwithstanding, from an overall view and in the local context, projects with high level of green initiatives do attract higher capital cost.
## Cost Drivers for Green Buildings

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Source of Possible Cost Increases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Level and type of certification sought</td>
<td>Green Building Index, LEED, Green Mark, Green Star, etc. Due to localization as well as the differing emphasis of the various tools, costs could range from 1% to 15%</td>
</tr>
<tr>
<td>2. Stage of the project when the decision is made to seek certification</td>
<td>After 50% completion of construction drawings, adding green features gets a lot more costly</td>
</tr>
<tr>
<td>3. Project type</td>
<td>With certain project types, such as science and technology laboratories, it can be costly to change established models, designs for office buildings are easier to change.</td>
</tr>
<tr>
<td>4. Experience of the design and construction teams in sustainable design and green buildings</td>
<td>Every organization has a “learning curve” for green buildings. Costs decrease with experienced team on board.</td>
</tr>
<tr>
<td>5. Specific green technologies added to a project, without full integration with other components</td>
<td>Under the current tariffs, Photovoltaics and Renewable Energy are going to add costs no matter what; it is possible to design a sustainable building building without them</td>
</tr>
<tr>
<td>6. Lack of clear priorities for green measures and lack of a strategy (design process not integrated)</td>
<td>Each design team member considers strategies in isolation, in the absence of clear direction from the owner</td>
</tr>
<tr>
<td>7. Geographical location and climate</td>
<td>Location and climate can influence certain levels of certification – some harder than others</td>
</tr>
</tbody>
</table>
Managing Cost Premium

Key focus areas in managing cost premium are:

- Full and unqualified buy in from key decision makers, ie senior management / Board
- Comply with an integrated design process, ie green initiatives are not add ons (this process can save between 1-3% of cost)
- Select project team (design and construction) with green design experiences
- Optimise site selection and orientation
- Level of green certification sought – be clear about it
The Integrated Design Process

Integrated design process emphasizes more upfront investment
Integrated Approach

... Begin with the End in mind...
The logical basis of IDP

Max

Increasing cost and disruption

Min

Decreasing impact on performance

Schematic Design  Design Development  Contract Documentation  Construction

Source: Nils Larsson, ED, iiSBE
## Level of Green Certification VS Payback Periods
- **Green Building Index**

<table>
<thead>
<tr>
<th>Green Building Index Rating</th>
<th>Average M’sian Bldg</th>
<th>Meets MS1525</th>
<th>GBI Certified</th>
<th>GBI Silver</th>
<th>GBI Gold</th>
<th>GBI Platinum</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEI kWh/m².year</td>
<td>250</td>
<td>200 - 220</td>
<td>150 - 180</td>
<td>120 - 150</td>
<td>100- 120</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Energy Savings %</td>
<td>Base</td>
<td>10 - 20</td>
<td>30 - 40</td>
<td>40 -50</td>
<td>50 – 60</td>
<td>&gt; 60</td>
</tr>
<tr>
<td>Incremental construction cost %</td>
<td>Base</td>
<td>1 - 3</td>
<td>5 - 8</td>
<td>8 - 12</td>
<td>12 - 15</td>
<td>&gt;15</td>
</tr>
</tbody>
</table>

Source: Green Building Index
# Green Building Case Study – Suruhanjaya Tenaga

<table>
<thead>
<tr>
<th>PROJECT DESCRIPTION</th>
<th>8 Storey Corporate Office</th>
<th>RENEWABLE ENERGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASEMENT</td>
<td>8 Storey Corporate Office</td>
<td>PV INSTALLED</td>
</tr>
<tr>
<td>LOCATION</td>
<td>Plot 2CT5 Precinct 2, Putrajaya</td>
<td>OUTPUT EXPECTED</td>
</tr>
<tr>
<td>SITE AREA</td>
<td>4,928.11 sq.m.</td>
<td>MEASURED YIELD</td>
</tr>
<tr>
<td>PLOT RATIO</td>
<td>1:2.8</td>
<td>PV TYPE</td>
</tr>
<tr>
<td>DO OBTAINED</td>
<td>25/06/2007</td>
<td>ANNUAL PRODUCTION</td>
</tr>
<tr>
<td>BP OBTAINED</td>
<td>23/06/2008</td>
<td></td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>07/09/2007</td>
<td></td>
</tr>
<tr>
<td>COMMENCEMENT DATE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROSS FLOOR AREA (AS-BUILT)</td>
<td>14,690.97 sq.m.</td>
<td>DESIGN BUILDING ENERGY INDEX (WITHOUT PV)</td>
</tr>
<tr>
<td>NETT FLOOR AREA (AS-BUILT)</td>
<td>11,668.39 sq.m.</td>
<td>DESIGN BUILDING ENERGY INDEX (WITH PV)</td>
</tr>
<tr>
<td>CPC OBTAINED ON</td>
<td>15/03/2010</td>
<td>ACTUAL BUILDING ENERGY INDEX</td>
</tr>
<tr>
<td>CCC OBTAINED ON</td>
<td>09/06/2010</td>
<td></td>
</tr>
<tr>
<td>PROJECT COST</td>
<td>RM76.5 Mil</td>
<td>GBI CERTIFIED PLATINUM (SCORE 88/100)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GREEN COST CERTIFIED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ENERGY GREEN MARK CERTIFIED PLATINUM (95/120)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Source: Putra Perdana Construction</td>
</tr>
</tbody>
</table>

71.4 kWp
1,398.37 kWh/kWp/yr
1,425 kWh/kWp
Thin Film
102MWh (9.5% of energy consumption)
85kWh/m²/year
75kWh/m²/year
± 65kWh/m²/year
27/04/2011
RM4.5 Mil
27/04/2011
Platinum95/120
Life Cycle Costs of a Building

30-year cost of a building

- Design & Construction
- Maintenance
- Personnel Salaries

% COST
Post Occupancy Evaluation Results
Productivity at The Bond, Sydney

A Significant Decrease in Health related issues =
40% Reduction in Sick Leave

<table>
<thead>
<tr>
<th>Health Concerns</th>
<th>Incidence</th>
<th>Australia Squares</th>
<th>The Bond</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sore Eyes</td>
<td>57%</td>
<td>27%</td>
<td>17%</td>
</tr>
<tr>
<td>Tiredness</td>
<td>53%</td>
<td>17%</td>
<td>13%</td>
</tr>
<tr>
<td>Headache</td>
<td>34%</td>
<td></td>
<td>23%</td>
</tr>
<tr>
<td>Sore Throat/Colds</td>
<td>23%</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Dry Skin</td>
<td>22%</td>
<td></td>
<td>8%</td>
</tr>
</tbody>
</table>
Post Occupancy Evaluation Results
Productivity at The Bond, Sydney

51% of workers indicated increased productivity = an overall 10% increase

Productivity Ranking +/-

-3: 0.5%
-2: 2.7%
-1: 3.8%
0: 41.9%
1: 30.1%
2: 14%
3: 6.8%
Investor Value – Superior Returns

- **Standard Investment Return ($x)**
- **Incremental Return via Green Value Creation ($y)**
  - Opex Savings
  - Rent /Income growth
  - Sunk “Green” Capex
  - Govt Incentives
- **Superior Investment Return**
  - Standard Return + Incremental Return
  - [$x + $y]
Definition Of Value

Value = Income – Operating Expense

Land & Development Cost + Design & Construction Cost

For income producing investment property
Financial Benefits of Green Buildings

(by M. Ito, The Sumitomo Trust & Banking CO., Ltd.)
Capital Benefits of Green Buildings

(1) Poor environmentally-conscious property
(2) Environmentally-conscious property

(by M. Ito, The Sumitomo Trust & Banking Co., Ltd.)
What then, is ‘Value’ in the Sustainability context?

Key values:

- Environmental preservation
- Return on investment

- A property solution that is worth more tomorrow than it is today (total return), ie increased valuation and higher rents (yield/IRR)
- More operationally efficient buildings
- More socially productive spaces
- Brand positioning
- Option value of future proofing
Benefits From Owner / Developer’s Perspective

Key benefits to building owners / developers:

- Reduced operating costs
- Attractive marketability - market differentiator
- Higher returns on assets and increased property values
- Increased productivity
- Higher occupancy rates and lower tenant turnover
- Reduced liability and risk
- Reduced risk of obsolescence / futureproofing

The Gauge, Lend Lease’s Melbourne HQ, GBCA Six Star Green Star recipient
Average Savings of Green Buildings

- **Energy Savings**: 30%
- **Carbon Savings**: 35%
- **Water Use Savings**: 30-50%
- **Waste Cost Savings**: 50-90%

Source: Capital E
A $4 investment per square foot in building green nets a $58 benefit per square foot over 20 years.

Source: US GBC
The big clean-up

Volunteers picking up rubbish along the seafront off Penang's Gurney Drive in conjunction with Earth Day 2010 yesterday. Some 6.4 tonnes of rubbish from a refrigerator to an excavator tyre were collected from the island's famous beaches.

See Page 3.

CHIN CHEN YEANG / The Star
Conclusion

Cost

- At this current point in time there exists a cost premium for going green.
- However, as more buildings embrace sustainability, the cost premium will be insignificant and no longer becomes a key consideration.
- Eventually, green buildings will become the standard Grade ‘A’ buildings, the difference being the level of green certification/rating.
Conclusion

Value

- Given the depletion of natural resources and with rising utility costs, commercial justification for green buildings will become very compelling.
- The protection of the ecosystem is immeasurable and will go a long way in improving the world that we and our future generations live in.
- Sustainability is not only the right and smart thing to do but the responsible thing to do.
Sustainability: Every Action Adds Up