Building Energy Efficiency in Hong Kong: Case Study of a Commercial Building with BEAM Plus Provisional Platinum Rating (Existing Buildings)

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World Sustainable Built Environment Conference 2017 Hong Kong
Session 1.4: Practices Review of High-Performance Green Buildings
5 June 2017
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BEAM Plus Existing Buildings V1.2

What Aspects are focused for Existing Building?
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Hong Kong has more than 42,000 existing buildings.

Electricity Consumption
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Background of Building

- **Function**: Offices
- **Location**: Kowloon Tong, near the Kowloon Tong MTR station and a bus terminus
- **No. of floors**: 3 floors and a car park area at LG
- **Floor area**: Approx. 4,000 sq.m
- **Completion date**: September 1996
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Chiller Replacement

• New oil free variable speed air-cooled chiller
Chiller Replacement

- Better COP & part load performance
- Energy Consumption of chilled water system reduced approximately **30%**.
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**Lighting Upgrade**

<table>
<thead>
<tr>
<th>BEC Office</th>
<th>No. of Luminaire</th>
<th>Unit Power of Luminaire (W)</th>
<th>Annual Power Consumption (kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T8 Florescent Tube</td>
<td>207</td>
<td>60</td>
<td>19,698</td>
</tr>
<tr>
<td>LED Panel</td>
<td>111</td>
<td>40</td>
<td>9,490</td>
</tr>
<tr>
<td>Improvement</td>
<td>96 Reduced</td>
<td>33% Reduced</td>
<td>52% Reduced</td>
</tr>
</tbody>
</table>

**SAVE!**
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Lighting Upgrade – Wide Adoption of LED

- Office/Corridor
- Lift
- Indoor Staircases/BOH Corridors
- Exit Sign
- Floor Light
- External Staircases
Installation of Lighting Sensors

Daylight Sensor

Occupancy Sensor at Toilet & LG/F
Installation of Power Meters

- Separately monitoring of power consumption
  - Chiller Plant
  - Air Handling Units
  - Lighting system
  - Lift Installation
  - Small power
Installation of Energy Meters

- To evaluate energy consumption of air-conditioning
- To be adopted as a factor of Green Lease
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Retro-commissioning of BS Installations
• Optimise system performance
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Stairs Days

1. Stair Friday
2. Stair Monday & Friday
3. Invite tenants to participate

5% daily lift electricity consumption is saved.
Lighting Energy Saving Measures

- Reduce excessive lighting

Lighting zones

Light Off during Lunch
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Energy Saving Reminder

Please keep the thermostat at 25°C for energy conservation.

Don’t forget:
Supporting to Government Initiatives

• Charter on External Lighting
• Energy Saving Charter

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Electricity Consumption of BEC-HQs in 2016 has decreased 31.5% when compared with 2013.

Electricity Consumption of BEC-HQs

- 2013: 557,696 kWh
- 2014: 477,668 kWh (14% decrease from 2013)
- 2015: 424,330 kWh
- 2016: 382,153 kWh
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BEAM Plus Achievement

<table>
<thead>
<tr>
<th>Category</th>
<th>Weighting (%)</th>
<th>Credits Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Aspects</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Materials Aspects</td>
<td>12</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Energy Use</strong></td>
<td><strong>30</strong></td>
<td><strong>24.4</strong></td>
</tr>
<tr>
<td>Water Use</td>
<td>15</td>
<td>10.7</td>
</tr>
<tr>
<td>Indoor Environmental Quality</td>
<td>25</td>
<td>19.2</td>
</tr>
<tr>
<td>Innovations and Additions</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>79.7</strong></td>
<td></td>
</tr>
</tbody>
</table>

Achieved the Platinum Rating of Provisional Assessment under the BEAM Plus Existing Buildings (V1.2)
Conclusion

- Significant reduction on electricity consumption
- Showcase of green building transformation
- Continual improvement
Thank you