

# Half-Day Seminar on Greening Hotels

Kuala Lumpur

3<sup>rd</sup> October 2013

organisers



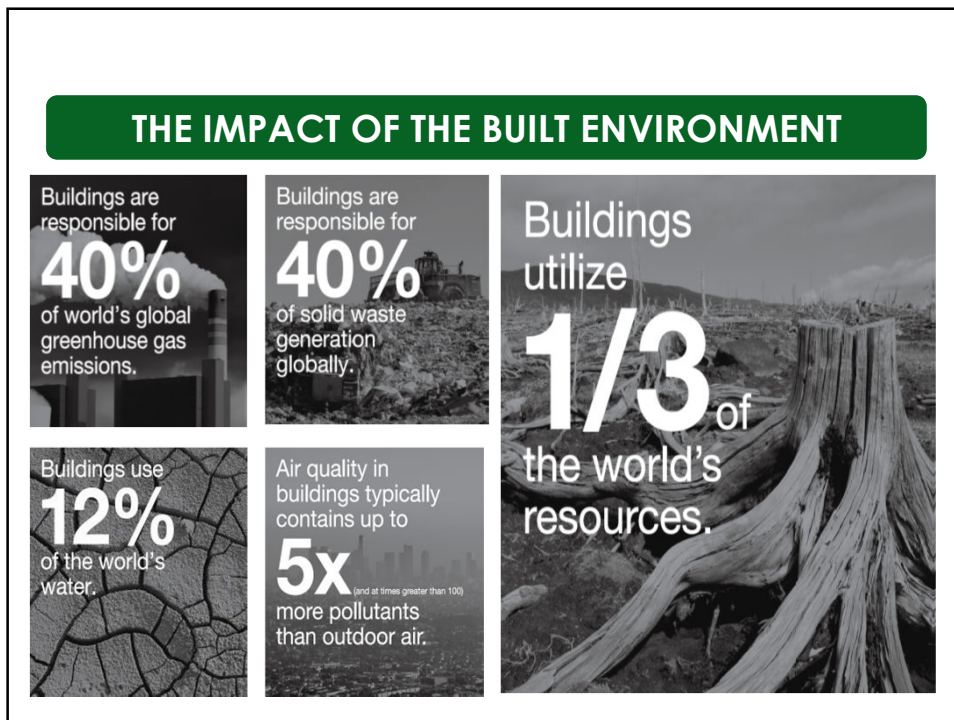
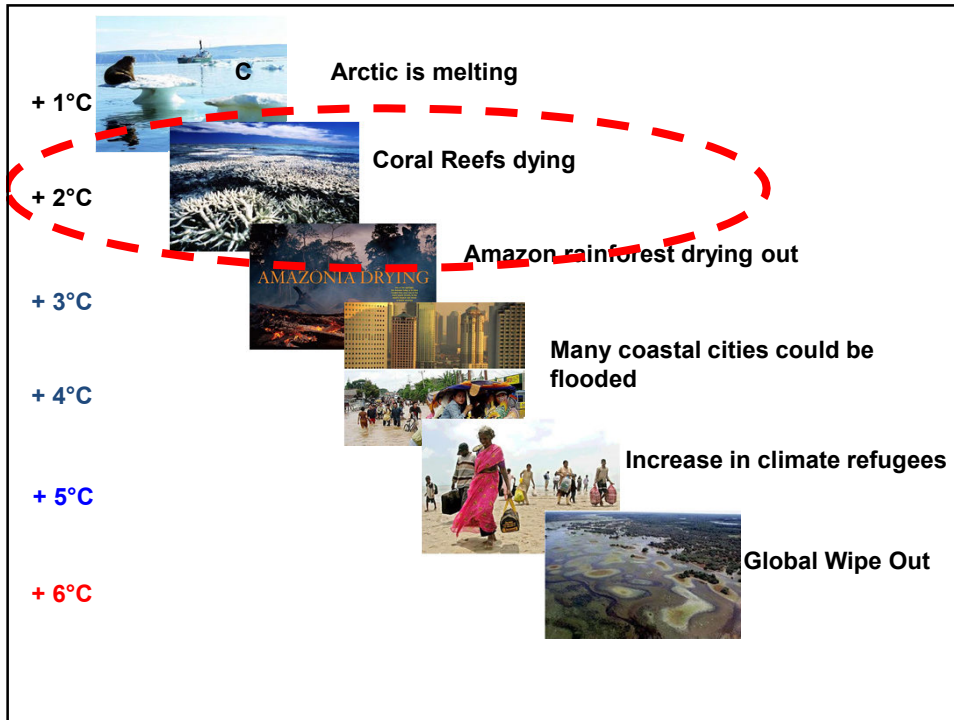
event partner

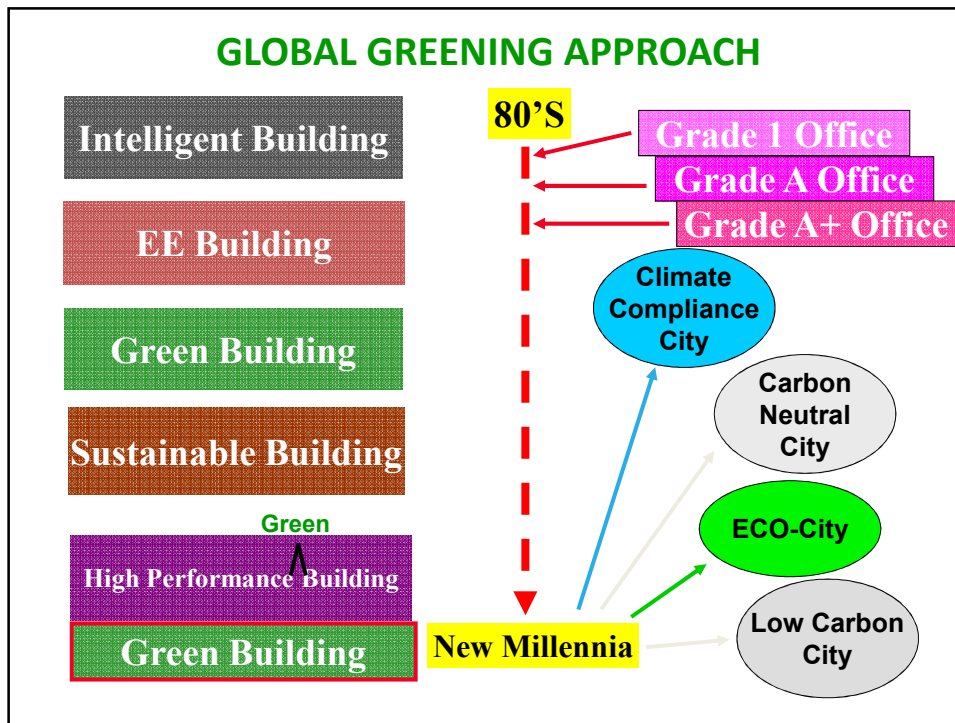


[www.greenbuildingindex.org](http://www.greenbuildingindex.org)

## GREENING HOTELS

Ir Chen Thiam Leong





- Australia: Nabers / Green Star
- Brazil: AQUA / LEED Brasil
- Canada: LEED Canada / Green Globes
- China: GBAS
- Finland: PromisE
- France: HQE
- Germany: DGNB / CEPHEUS
- Hong Kong: HKBEAM
- India: GRIHA
- Italy: Protocollo Itaca / Green Building Council Italia
- Malaysia: GBI Malaysia
- Mexico: LEED Mexico
- Netherlands: BREEAM Netherlands
- New Zealand: Green Star NZ
- Philippines: BERDE / Philippine Green Building Council
- Portugal: Lider A
- Singapore: Green Mark
- South Africa: Green Star SA
- Spain: VERDE
- Switzerland: Minergie
- United States: LEED / Living Building Challenge / Green Globes  
/ Build it Green / NAHB NGBS
- United Kingdom: BREEAM
- United Arab Emirates: Estidama

Green or Sustainability Rating Comparisons

Item	Description	LEED	BREEAM	BEPAC	GB Tool	CASBEE	EEWH	Green Star	Green Mark	HK_BEAM
		USA	UK	Canada	Europe	Japan	Taiwan	Australia	Singapore	Hong Kong
1	Sustainable Site - Site Planning, Eco system	√	√		√			√	√	√
2	Water Efficiency	√	√					√	√	√
3	Energy Efficiency - Energy Use & CO2 Issues	√	√	√			√	√	√	√
4	Material & Resources	√	√	√	√	√	√	√		√
5	Indoor Environment Quality	√		√	√	√		√	√	√
6	Innovation credits	√							√	√
7	Management before and/or after		√		√			√	√	
8	Health & Comfort		√							
9	Transportation		√					√		
10	Land Use		√							
11	Pollution/Neighbourhood environment		√		√	√		√		
12	Depletion of Ozone Layer			√						
13	Services/Quality				√					
14	Economy				√					
15	Building Environment Quality & Performance					√				
16	Quality of Service					√				
17	Ecology- Biodiversity, Green, water retention						√			
18	Health - Waste conservation, sewage & garbage improvement						√			
	Rating classifications	Platinum Gold Silver Certified	Excellent VeryGood Good Pass				Diamond Gold Silver Bronze Certified	6-Star World leader 5-Star Aussie Excellence 4-Star Best Practice	Platinum Gold plus Gold Certified	Platinum Gold Silver Bronze

**Is it Difficult (or Easy) to Green Rate a Hotel ?**

GBI NREB (Hotel)			GBI Score		
Part	Criteria	Item	Max Points		
1	<b>EE</b>	<b>Energy Efficiency</b>			
	EE1	Minimum EE Performance	2		
	EE2	Lighting Zoning	3		
	EE3	Electrical Sub-metering	2		
	EE4	Renewable Energy	5		
	EE5	Advanced Energy Performance - BEI	15		
	EE6	Enhanced Commissioning	4		
	EE7	Post Occupancy Commissioning	2		
	EE8	EE Monitoring & Improvement	2		
	EE9	Sustainable Maintenance	3		
			EE total	<b>38</b>	

GBI NREB (Hotel)			GBI Score		
Part	Criteria	Item	Max Points	Baseline	
1	<b>EE</b>	<b>Energy Efficiency</b>			
	EE1	Minimum EE Performance	2	2	
	EE2	Lighting Zoning	3	1	
	EE3	Electrical Sub-metering	2	2	
	EE4	Renewable Energy	5	0	
	EE5	Advanced Energy Performance - BEI	15	0	
	EE6	Enhanced Commissioning	4	0	
	EE7	Post Occupancy Commissioning	2	1	
	EE8	EE Monitoring & Improvement	2	2	
	EE9	Sustainable Maintenance	3	3	
			EE total	<b>38</b>	<b>11</b>

		<b>EQ</b>	<b>Indoor Environmental Quality</b>		
2	EQ1	Minimum IAQ Performance	1		
	EQ2	Environmental Tobacco Control	1		
	EQ3	CO2 Monitoring & Control	1		
	EQ4	Indoor Air Pollutants	2		
	EQ5	Mould Prevention	1		
	EQ6	Thermal Comfort	2		
	EQ7	Air Change Effectiveness	1		
	EQ8	Daylighting	2		
	EQ9	Daylight Glare Control	1		
	EQ10	Electric Lighting Levels	1		
	EQ11	High Frequency Ballasts	1		
	EQ12	External Views	2		
	EQ13	Internal Noise Levels	1		
	EQ14	IAQ Before & During Occupancy	2		
	EQ15	Post Occupancy Comfort Survey	2		
		EQ total	<b>21</b>		

		<b>EQ</b>	<b>Indoor Environmental Quality</b>		
2	EQ1	Minimum IAQ Performance	1	0	
	EQ2	Environmental Tobacco Control	1	0	
	EQ3	CO2 Monitoring & Control	1	0	
	EQ4	Indoor Air Pollutants	2	0	
	EQ5	Mould Prevention	1	1	
	EQ6	Thermal Comfort	2	2	
	EQ7	Air Change Effectiveness	1	0	
	EQ8	Daylighting	2	0	
	EQ9	Daylight Glare Control	1	1	
	EQ10	Electric Lighting Levels	1	1	
	EQ11	High Frequency Ballasts	1	1	
	EQ12	External Views	2	0	
	EQ13	Internal Noise Levels	1	1	
	EQ14	IAQ Before & During Occupancy	2	2	
	EQ15	Post Occupancy Comfort Survey	2	2	
		EQ total	<b>21</b>	<b>11</b>	

	<b>SM</b>	<b>Sustainable Site Planning &amp; Management</b>		
3	SM1	GBI Rated Design & Construction	1	
	SM2	Building Exterior Management	1	
	SM3	Integrated Pest Management, Erosion Control & Landscape Management	1	
	SM4	Green Vehicle Priority	1	
	SM5	Parking Capacity	1	
	SM6	Greenery & Roof	4	
	SM7	Building User Manual	1	
			SM total	<b>10</b>

	<b>SM</b>	<b>Sustainable Site Planning &amp; Management</b>		
3	SM1	GBI Rated Design & Construction	1	0
	SM2	Building Exterior Management	1	0
	SM3	Integrated Pest Management, Erosion Control & Landscape Management	1	0
	SM4	Green Vehicle Priority	1	1
	SM5	Parking Capacity	1	1
	SM6	Greenery & Roof	4	0
	SM7	Building User Manual	1	1
			SM total	<b>10</b>

4	<b>MR</b>	<b>Materials &amp; Resources</b>		
	MR1	Materials reuse and selection	1	
	MR2	Recycled content materials	1	
	MR3	Sustainable Timber	1	
	MR4	Sustainable Purchasing Policy	1	
	MR5	Storage, Collection & Disposal of Recyclables	3	
	MR6	Refrigerants & Clean Agents	2	
		MR total	<b>9</b>	
5	<b>WE</b>	<b>Water Efficiency</b>		
	WE1	Rainwater Harvesting	3	
	WE2	Water Recycling	2	
	WE3	Water Efficient – Irrigation / Landscaping	2	
	WE4	Water Efficient Fittings	3	
	WE5	Metering & Leak Detection System	2	
			WE total	<b>12</b>

4	<b>MR</b>	<b>Materials &amp; Resources</b>		
	MR1	Materials reuse and selection	1	0
	MR2	Recycled content materials	1	0
	MR3	Sustainable Timber	1	0
	MR4	Sustainable Purchasing Policy	1	0
	MR5	Storage, Collection & Disposal of Recyclables	3	1
	MR6	Refrigerants & Clean Agents	2	1
		MR total	<b>9</b>	<b>2</b>
5	<b>WE</b>	<b>Water Efficiency</b>		
	WE1	Rainwater Harvesting	3	0
	WE2	Water Recycling	2	0
	WE3	Water Efficient – Irrigation / Landscaping	2	0
	WE4	Water Efficient Fittings	3	0
	WE5	Metering & Leak Detection System	2	0
			WE total	<b>12</b>



	<b>IN</b>	<b>Innovation</b>			
6	IN1	Innovation in Design & Environmental Design Initiatives	9		
		Recycling of Fire Testing Water			
	IN2	Green Building Index Facilitator	1		
			IN total	<b>10</b>	
		<b>TOTAL</b>	<b>100</b>		

	<b>IN</b>	<b>Innovation</b>			
6	IN1	Innovation in Design & Environmental Design Initiatives	9		
		Recycling of Fire Testing Water		0	
				0	
				0	
	IN2	Green Building Index Facilitator	1	0	
			IN total	<b>10</b>	<b>0</b>
		<b>TOTAL</b>	<b>100</b>	<b>27</b>	

GBI NREB (Hotel)			GBI Score		
Part	Criteria	Item	Max Points	Baseline	GBI Certified
1	<b>EE</b>	<b>Energy Efficiency</b>			
	EE1	Minimum EE Performance	2	2	2
	EE2	Lighting Zoning	3	1	2
	EE3	Electrical Sub-metering	2	2	2
	EE4	Renewable Energy	5	0	0
	EE5	Advanced Energy Performance - BEI	15	0	0
	EE6	Enhanced Commissioning	4	0	0
	EE7	Post Occupancy Commissioning	2	1	1
	EE8	EE Monitoring & Improvement	2	2	2
	EE9	Sustainable Maintenance	3	3	3
			EE total	<b>38</b>	<b>11</b>

2	<b>EQ</b>	<b>Indoor Environmental Quality</b>			
	EQ1	Minimum IAQ Performance	1	0	1
	EQ2	Environmental Tobacco Control	1	0	1
	EQ3	CO2 Monitoring & Control	1	0	1
	EQ4	Indoor Air Pollutants	2	0	0
	EQ5	Mould Prevention	1	1	1
	EQ6	Thermal Comfort	2	2	2
	EQ7	Air Change Effectiveness	1	0	0
	EQ8	Daylighting	2	0	1
	EQ9	Daylight Glare Control	1	1	1
	EQ10	Electric Lighting Levels	1	1	1
	EQ11	High Frequency Ballasts	1	1	1
	EQ12	External Views	2	0	0
	EQ13	Internal Noise Levels	1	1	1
	EQ14	IAQ Before & During Occupancy	2	2	2
EQ15	Post Occupancy Comfort Survey	2	2	2	
		EQ total	<b>21</b>	<b>11</b>	<b>15</b>

	<b>SM</b>	<b>Sustainable Site Planning &amp; Management</b>			
3	SM1	GBI Rated Design & Construction	1	0	1
	SM2	Building Exterior Management	1	0	1
	SM3	Integrated Pest Management, Erosion Control & Landscape Management	1	0	1
	SM4	Green Vehicle Priority	1	1	1
	SM5	Parking Capacity	1	1	1
	SM6	Greenery & Roof	4	0	2
	SM7	Building User Manual	1	1	1
			SM total	<b>10</b>	<b>3</b>

	<b>MR</b>	<b>Materials &amp; Resources</b>			
4	MR1	Materials reuse and selection	1	0	0
	MR2	Recycled content materials	1	0	0
	MR3	Sustainable Timber	1	0	1
	MR4	Sustainable Purchasing Policy	1	0	1
	MR5	Storage, Collection & Disposal of Recyclables	3	1	3
	MR6	Refrigerants & Clean Agents	2	1	1
			MR total	<b>9</b>	<b>2</b>
	<b>WE</b>	<b>Water Efficiency</b>			
5	WE1	Rainwater Harvesting	3	0	1
	WE2	Water Recycling	2	0	0
	WE3	Water Efficient – Irrigation / Landscaping	2	0	1
	WE4	Water Efficient Fittings	3	0	3
	WE5	Metering & Leak Detection System	2	0	2
			WE total	<b>12</b>	<b>0</b>

IN	Innovation				
6	IN1	Innovation in Design & Environmental Design Initiatives	9		
		Recycling of Fire Testing Water		0	1
		Refrigerant leakage detection & recycling facilities		0	0
		Carpark mech ventilation fans provided with VSD and CO <sub>2</sub> control		0	1
		ISO14000 certification		0	1
	IN2	Green Building Index Facilitator	1	0	1
	IN total	10	0	4	
	<b>TOTAL</b>	<b>100</b>	<b>25</b>	<b>52</b>	

GBI NRNC (Hotel)			
Criteria	Hotel (basic)	Hotel (4/5-star)	GBI Points
<b>EE5</b>	<b>ADVANCED EE PERFORMANCE</b>		
	$BEI_1 \leq 200$	$BEI_2 \leq 290$	2
	$BEI_1 \leq 190$	$BEI_2 \leq 270$	3
	$BEI_1 \leq 175$	$BEI_2 \leq 250$	5
	$BEI_1 \leq 160$	$BEI_2 \leq 233$	8
	$BEI_1 \leq 150$	$BEI_2 \leq 212$	10
	$BEI_1 \leq 135$	$BEI_2 \leq 195$	12
	$BEI_1 \leq 120$	$BEI_2 \leq 175$	15

**OR** demonstrate over last 3 years, BEI improved by;

<b>GBI NREB (Hotel)</b>			
<b>Criteria</b>	<b>Hotel (basic)</b>	<b>Hotel (4/5-star)</b>	<b>GBI Points</b>
<b>EE5</b>	<b>ADVANCED EE PERFORMANCE</b>		
	$\geq 20\%$ AND $BEI_1 \leq 267$	$\geq 20\%$ AND $BEI_2 \leq 387$	2
	$\geq 25\%$ AND $BEI_1 \leq 228$	$\geq 25\%$ AND $BEI_2 \leq 324$	3
	$\geq 30\%$ AND $BEI_1 \leq 200$	$\geq 30\%$ AND $BEI_2 \leq 290$	5
	$\geq 40\%$ AND $BEI_1 \leq 190$	$\geq 40\%$ AND $BEI_2 \leq 270$	8
	$\geq 50\%$ AND $BEI_1 \leq 175$	$\geq 50\%$ AND $BEI_2 \leq 250$	10
	$\geq 60\%$ AND $BEI_1 \leq 160$	$\geq 60\%$ AND $BEI_2 \leq 233$	12
	$\geq 70\%$ AND $BEI_1 \leq 150$	$\geq 70\%$ AND $BEI_2 \leq 212$	15

## NON-RESIDENTIAL BUILDINGS

<b>Rating Tools</b>	<b>Energy Effy</b>	<b>IEQ</b>	<b>Sustainable Site</b>	<b>Materials &amp; Resources</b>	<b>Water Effy</b>	<b>Innovation</b>
<b>BREEAM 2008</b>	19%	*13%	*37%	*17%	5%	*9%
<b>LEED v2.2</b>	25%	22%	20%	19%	7%	7%
<b>Green Mark v3</b>	62%	5%	*20%		9%	4%
<b>Green Star v3</b>	20%	19%	*33%	16%	8%	4%
<b>GBI V1.0</b>	35%	21%	16%	11%	10%	7%
<b>LEED v3</b>	35%	15%	26%	14%	10%	*10%

\* Denotes adjusted or amalgamated figures

## Does *green* pay off (in USA)?

LEED	Certified	Silver	Gold	Platinum
LEED Points	23 - 27	28 - 33	34 - 44	45 - 61
Energy Savings	25 - 35%	35 - 50%	50 - 60%	> 60%
Annual Utility Savings	US\$0.40/ft <sup>2</sup>	US\$0.60/ft <sup>2</sup>	US\$0.80/ft <sup>2</sup>	US\$1.00/ft <sup>2</sup>
Typ Payback	< 3 yrs	3 - 5 yrs	5 - 10 yrs	10+ yrs
<b>Incremental Construction Cost</b>				
Small bldgs	3%	7%	10%	15%
Large bldgs	1%	3%	5%	8%

Source: Enermodal Engineering, Denver, USA

## *Green* Cost Premium (Singapore)

Green Mark	Certified	Gold	Gold <sup>plus</sup>	Platinum
Points	50 - 74	75 - 84	85 - 89	90 - 100
Cost Premium	0.3 - 1%	1 - 2%	1 - 3%	2 - 8%
Payback Period	2 - 5 yrs	2 - 6 yrs	2 - 6 yrs	2 - 8 yrs

Source: BCA Singapore 2008

Does *green* pay off (in Malaysia)?  
 - Non-Residential Buildings -  
 projected data by Ir TL Chen (not verified:2009)

Green Building Index Rating	Average M'sian Bldg	Meets MS1525	GBI Certified	GBI Silver	GBI Gold	GBI Platinum
BEI kWh/m <sup>2</sup> .year	250	200 - 220	150 - 180	120 - 150	100- 120	<100
Energy Savings %	Base	10 - 20	30 - 40	40 -50	50 - 60	> 60
Incremental construction cost %	Base	1 - 3 (0 - 3)*	5 - 8 (1 - 5)*	8 - 12 (3 - 8)*	12 - 15 (5 - 10)*	>15 (6 - 13)*

\* Denotes revised projection in 2011

POINTS	GBI RATING	INFERENCE
50 to 65	GBI CERTIFIED	Good Practice
66 to 75	GBI SILVER	Excellent Practice
76 to 85	GBI GOLD	National Excellence
86 +	GBI PLATINUM	Global Excellence



**THANK YOU**

[www.greenbuildingindex.org](http://www.greenbuildingindex.org)  
[www.mgbc.org.my](http://www.mgbc.org.my)