HONG KONG:

Green building assessment tools
And sustainable practices

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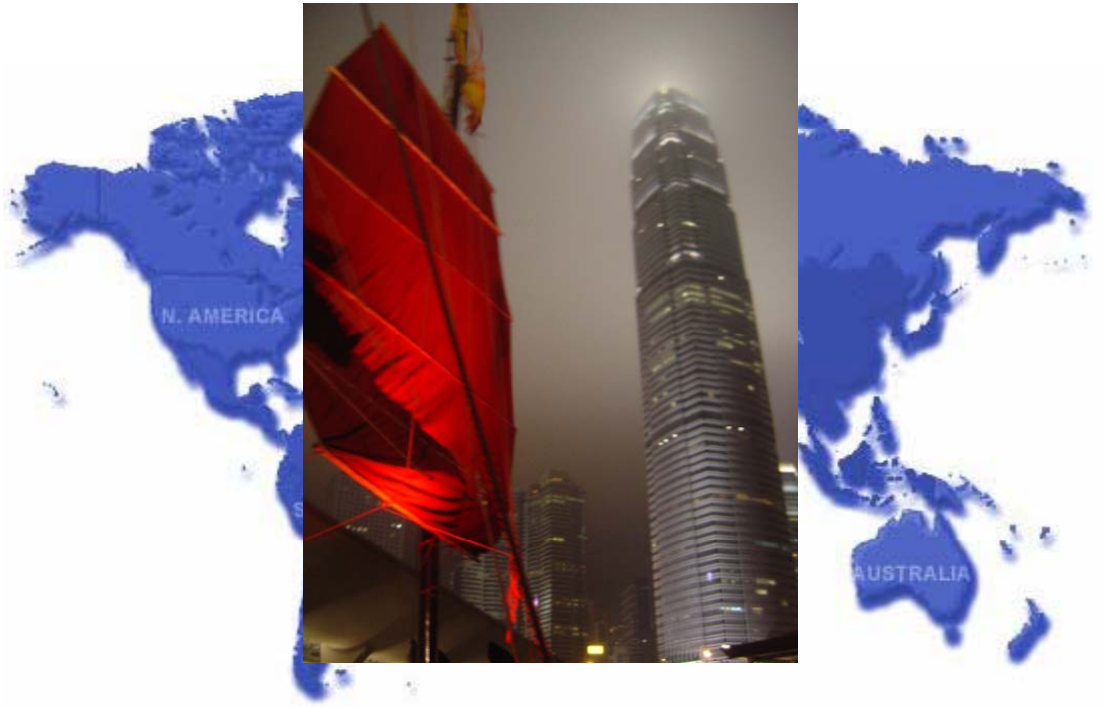
5. CURRENT ACTIVITIES AND PROJECTS.

1. HONG KONG SITUATION IN THE CONTEXT OF GREEN ARCHITECTURE TODAY. WHAT IS GOING ON?



LOCAL OR GLOBAL?

INFLUENCE OF DIFFERENT INTERNATIONAL GREEN BUILDING APPROACHES
UK, US, CHINA, JAPAN, AUSTRALIA.

What is green building?

HONG KONG: Green building assessment tools and sustainable practices

- **Green building** is the practice of *creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle* from siting to design, construction, operation, maintenance, renovation and deconstruction (U.S. EPA)

Table: Impacts of the built environment:

Aspects of Built Environment:	Consumption:	Environmental Effects:	Ultimate Effects :
Siting •Design •Construction •Operation •Maintenance •Renovation •Deconstruction	Energy •Water •Materials •Natural Resources	Waste •Air pollution •Water pollution •Indoor pollution •Heat islands •Stormwater runoff •Noise	Harm to Human Health •Environment Degradation •Loss of Resources

Green buildings are designed to reduce the overall impact of the built environment on human health and the natural environment by:

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee productivity
- Reducing waste, pollution and environmental degradation

What is Sustainable Building?

- The term relates to both process and product;
- It is more meaningful at a national or regional or urban level;
- Strictly speaking, a fully sustainable building would have to, over its **life-cycle**:
  - Not cause a diminution of fossil fuel supply;
  - Not cause a diminution in net potable water supply;
  - Not cause a diminution in supply of virgin materials;
  - Cause zero net emissions;
  - Cause zero negative ecological impacts;
  - Cause no negative impacts on construction workers, occupants or users (or investors??);
- These are fairly tough targets to meet…

Bad Habits in the Building Sector

Cause	Intermediate	End Result
Too much AC	Excess energy use	Excess GHG High operating costs Occupant discomfort
Bad orientation	Excess solar gain or not enough	Excess AC & GHG High operating costs Occupant discomfort
Too much glass	Bad energy performance Too much solar gain	Excess AC & GHG High operating costs Occupant discomfort
Wretched	Too much area / volume	Excess heating and AC Excess GHG High operating costs
	Excess materials	Embodied GHG Excess cost

Green Building and Sustainable building (based on performance)

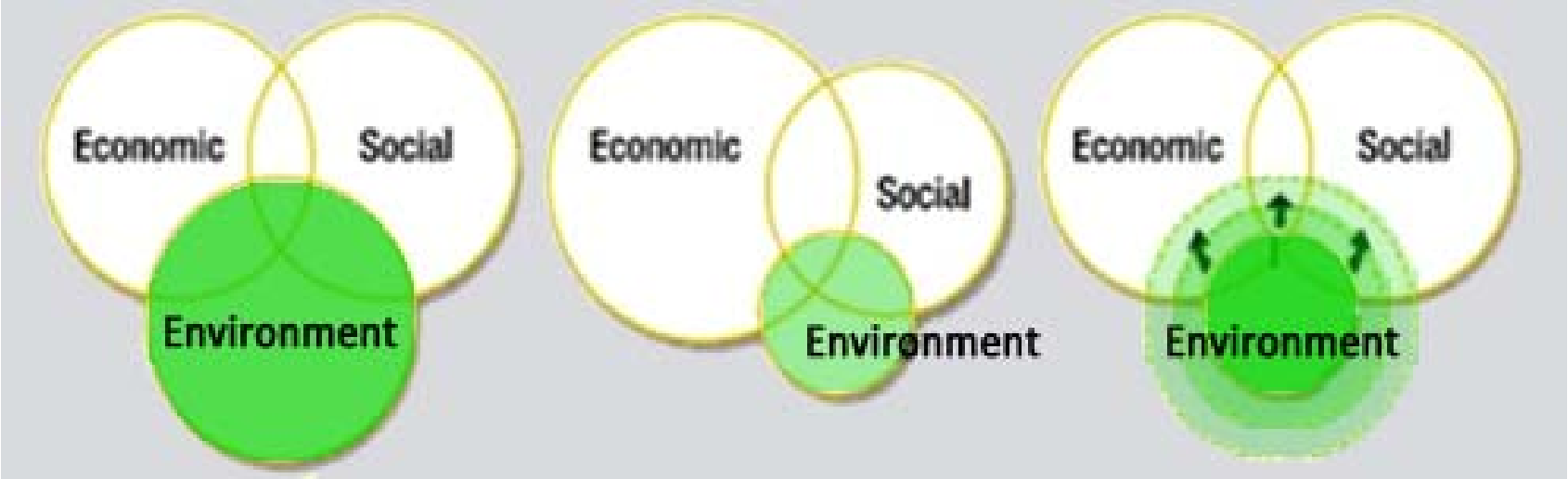
- Fuel consumption of non-renewable fuels
- Water consumption
- Land consumption
- Materials consumption
- Greenhouse gas emissions
- Other atmospheric emissions
- Impacts on site ecology
- Solid waste / liquid effluents
- Indoor air quality, lighting, acoustics
- Longevity, adaptability, flexibility
- Planning for good management
- Cost

- Social and economic considerations
- Urban / planning issues

Green Building

Sustainable Building

The Three Pillars of Sustainable Development



(Source: http://www.iucn.org/programme/)

From left to right:

the theory, the reality and the change needed to achieve Utopia.

2. PLETORA OF ASSESSMENT TOOLS. WHAT LABEL SHOULD HK FOLLOW ?

HONG KONG….THE BATTLE OF GREEN LABELS ?

Enhancing Hong Kong's Built Environment

HK-BEAM

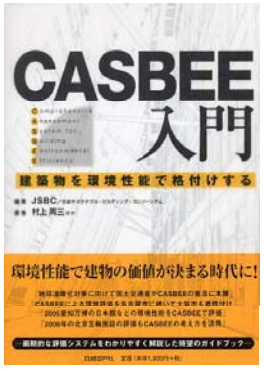
U.S. GREEN BUILDING COUNCIL

LEED

USGBC

绿色建筑标识

GREEN BUILDING LABEL



green star™

Green building certification tools

- LEED – USGBC
- BREEAM – UKBRE
- CASBEE – Japan
- GB Tool – Canada
- HK-BEAM – Hong Kong
- Green Building – Taiwan
- Green Building Label(GBL)–China
- Green Star - Australia

Green building certification tools

- LEED – USGBC

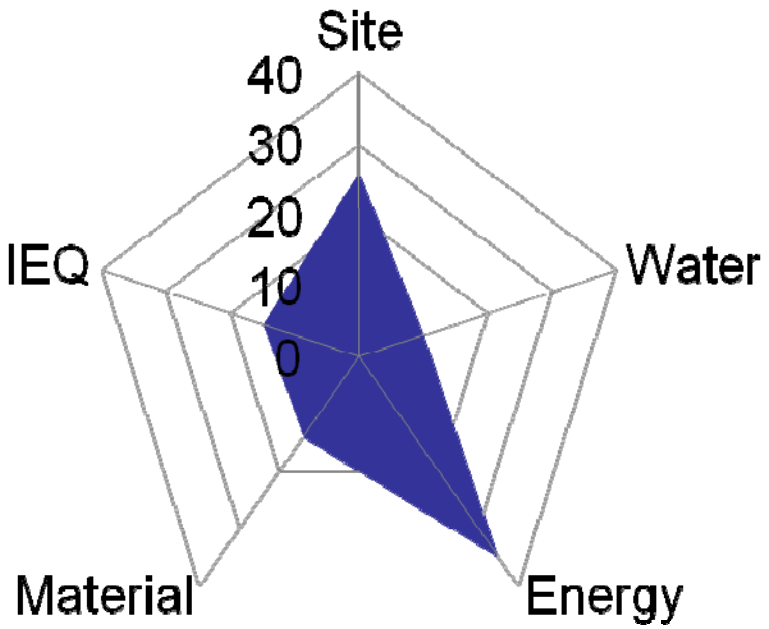
LEED® for New Construction

Total Possible Points**	110*
Sustainable Sites	26
Water Efficiency	10
Energy & Atmosphere	35
Materials & Resources	14
Indoor Environmental Quality	15

** Out of a possible 100 points + 10 bonus points*

*** Certified 40+ points, Silver 50+ points, Gold 60+ points, Platinum 80+ points*

Innovation in Design	6
Regional Priority	4



Green building certification tools

- Green Building Label(GBL)–China

Green Building Label (China)
(Public buildings)

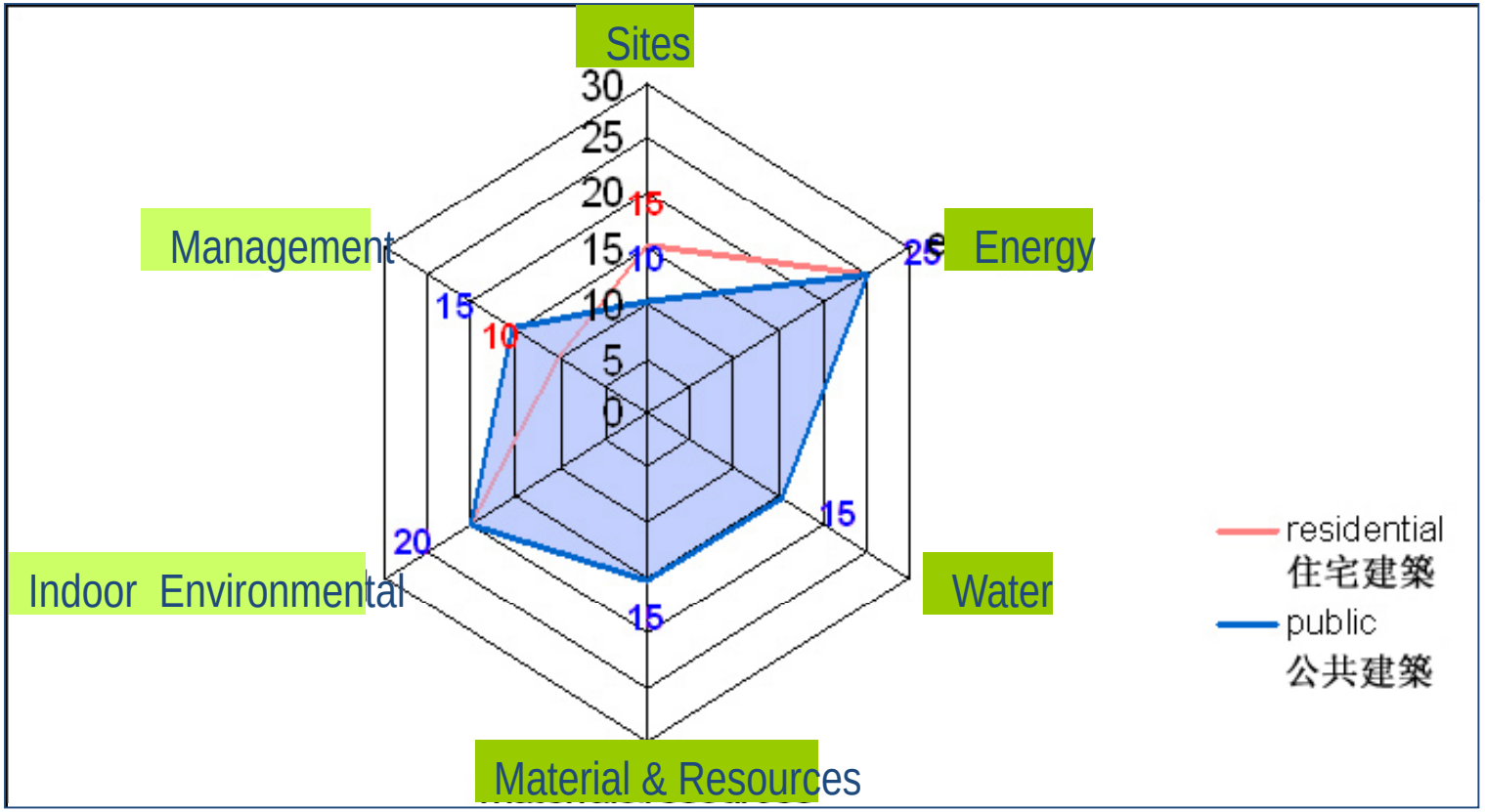
- ★—— 22 ~ 34 scores
- ★★—— 35 ~ 45 scores
- ★★★—— 46 ~ 57 scores

Green Building Design Label

Star-class	General Items (43 scores)						Green Building Label
	Land Saving & Outdoor Environment (6 scores)	Energy Saving & Utilization (10 scores)	Water Saving & Utilization (6 scores)	Material Saving & Utilization (8 scores)	Indoor Environmental Quality (6 scores)	Operation & Management (7 scores)	Optimal Items (14 scores)
★	**3**	**4**	**3**	**5**	**3**	**4**	**-**
★★	**4**	**6**	**4**	**6**	**4**	**5**	**6**
★★★	**5**	**8**	**5**	**7**	**5**	**6**	**10**

Table 1 Item Requirements for Grade Division (Public Buildings) (Source: Evaluation Standard of Green Building)

- **Green building certification tools**
  - Green Building Label(GBL)–China



CASBEE-NC (Japan)

Comprehensive Assessment System for Building Environment Efficiency

- Four basic assessment tools:

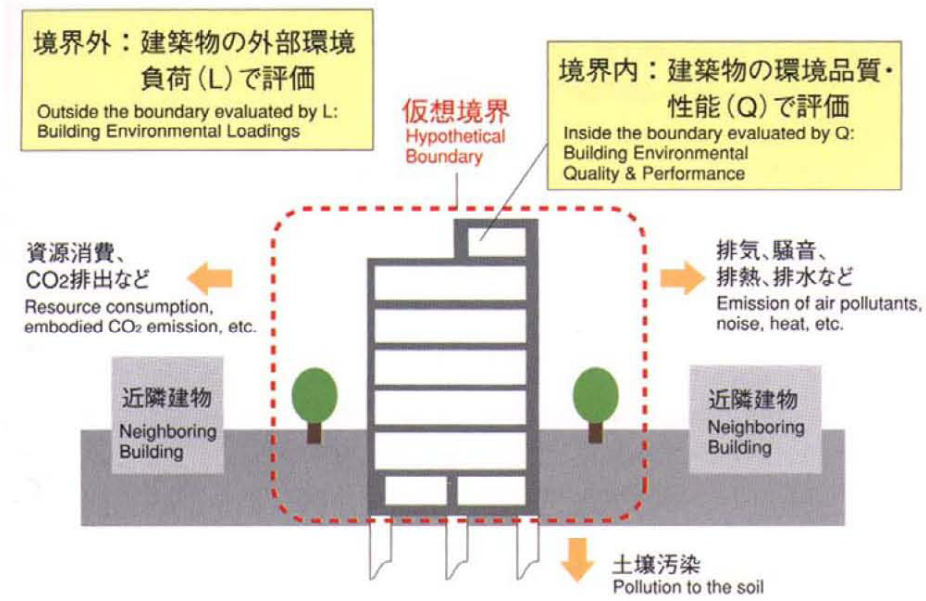
1) Pre-design (CASBEE-PD)
2) New Construction (CASBEE-NC) *
3) Existing Building (CASBEE-EB)
4) Renovation (CASBEE-RN)

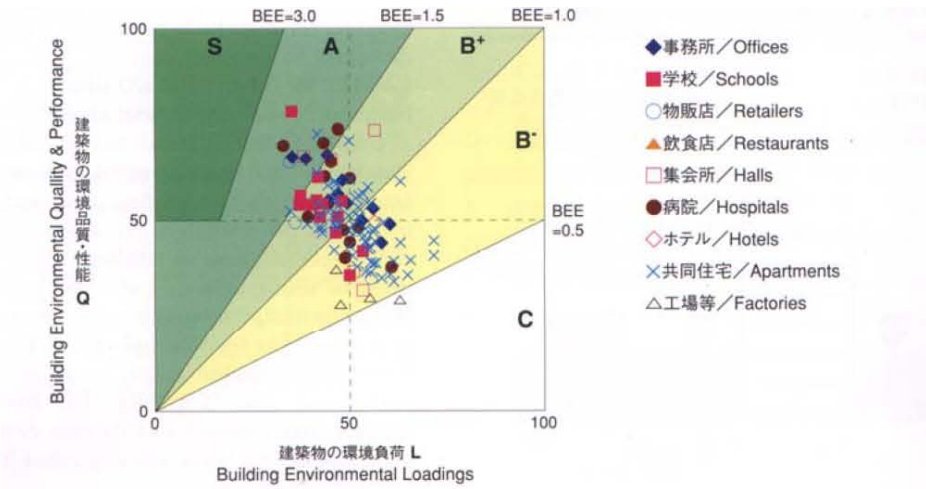
- New assessment tools (2005):

1) Heat Island Effect (CASBEE-HI)
2) Expo Site (CASBEE-R(EXPO))

- Ranking:

Rank S BEE > 3
Rank A 3>BEE>1.5
Rank B+ 1.5>BEE>1.0
Rank B - 1.0>BEE>0.5
Rank C 0.5>BEE>0





Green Building (Taiwan)

綠建築標章
GREEN BUILDING

Green Building Assessment System

- 9 Major Indexes:

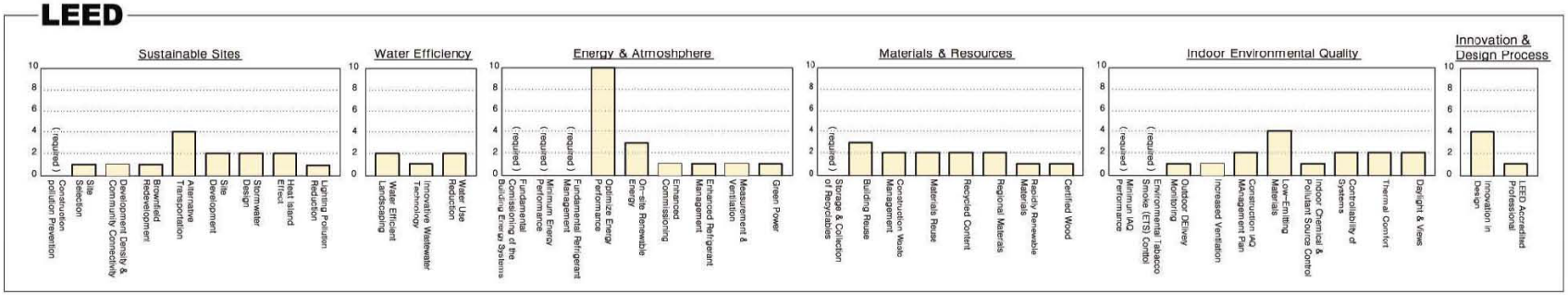
Table 0-1 9 Major Indicators of Green Building Assessment System, Their Relationship with Global Environment

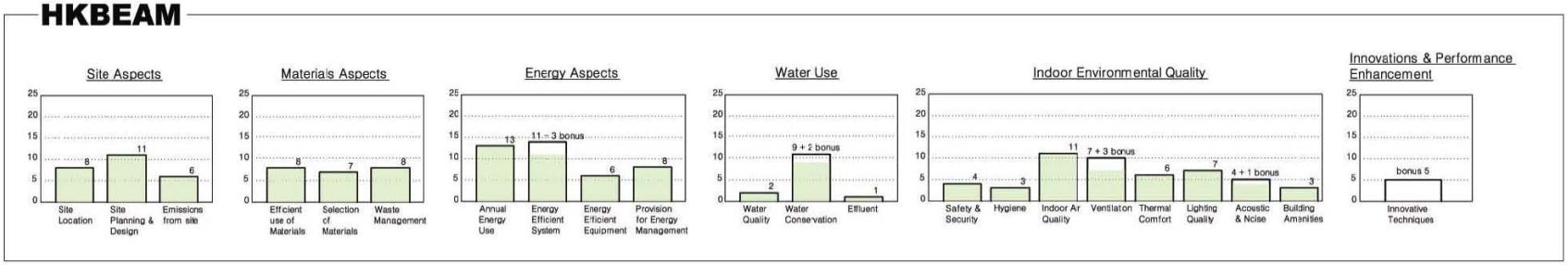
Major Index	Name of Indicator	Relationship with Global Environment						Order Arrangement		
		Climate	Water	Soil	Species	Energy	Material	Scale	Space	Operation Order
Ecology	1. Biodiversity	*	*	*	*			Large ↑ ↓ Small	Outdoor ↑ ↓ Indoor	First ↑ ↓ Latest
	2. Greenery	*	*	*	*					
	3. Soil Water Content	*	*	*	*					
Energy Saving	4. Daily Energy Saving	*				*				
Waste Reduction	5. CO_2 Emission Reduction			*		*	*			
	6. Waste Reduction			*			*			
Health	7. Indoor Environment			*		*	*			
	8. Water Resource	*	*							
	9. Sewage and Garbage Improvement		*		*		*			

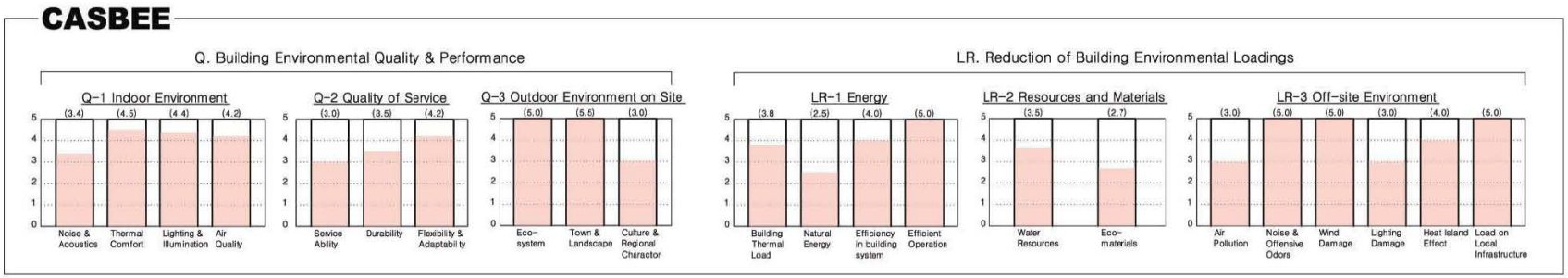
- RANKING:
  Number of EEWH indexes passed

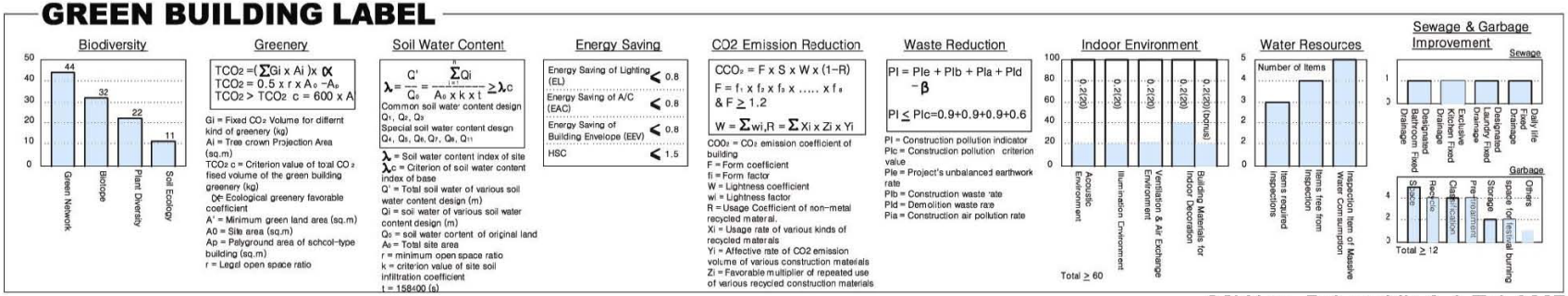
http://www.cabc.org.tw/gda/index.htm

Comparison and analysis of international tools

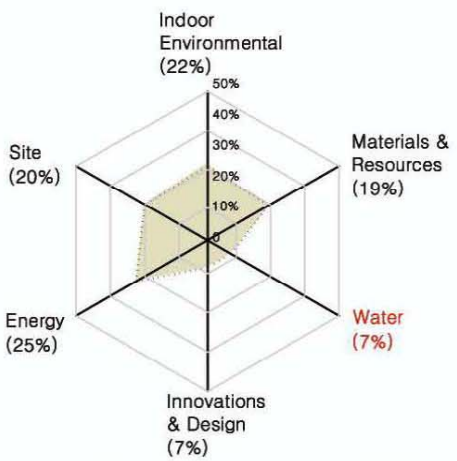




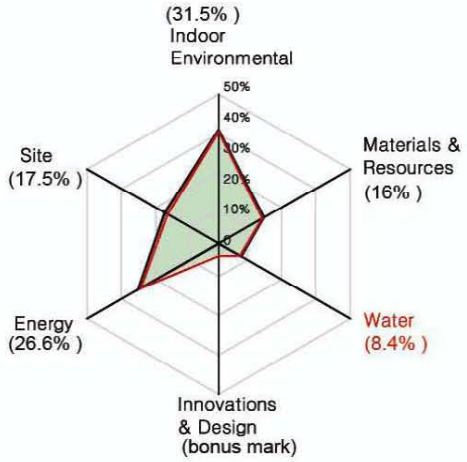




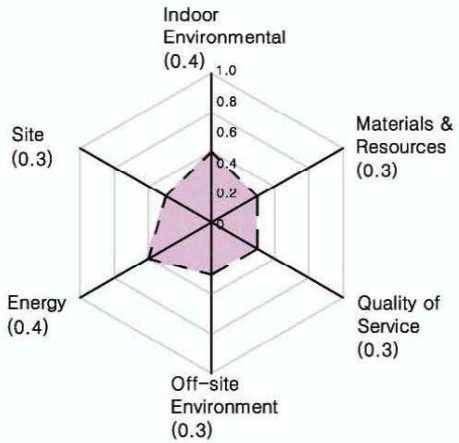
SSY Lau, Baharuddin & J. Tai, 2007



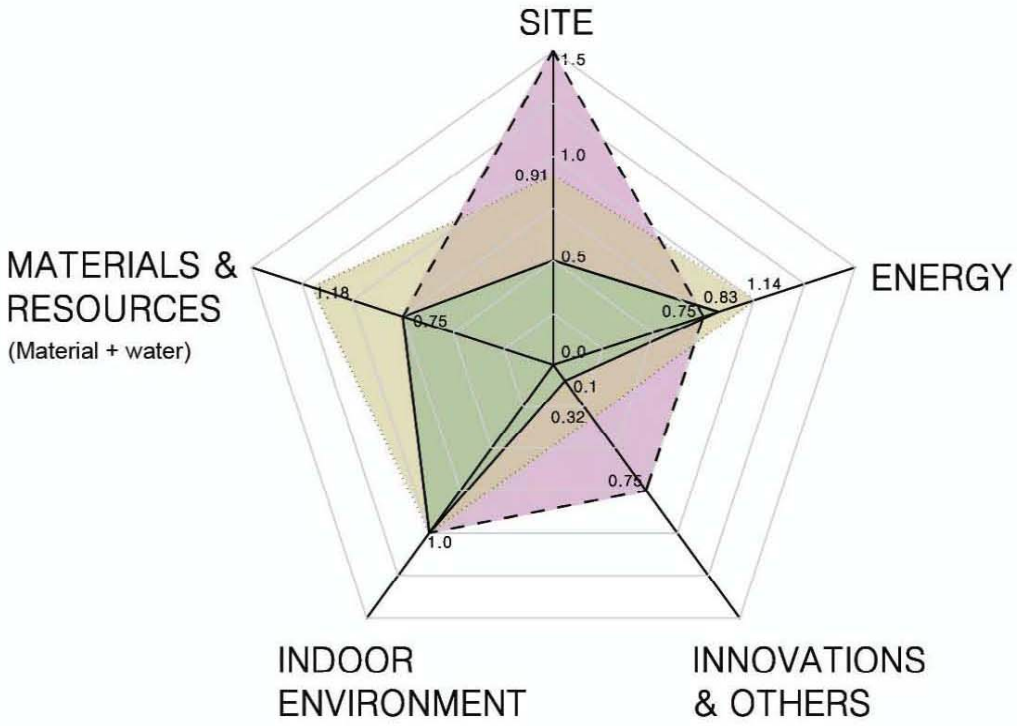
Score Distribution of LEED



Score Distribution of HKBEAM



Weight of CASBEE-NC



* Assumption :
1) Indoor Environment = 1.0

LEED

HKBEAM

CASBEE-NC

RELATIVE SCORE DISTRIBUTION SSY Lau, Baharuddin & J. Tai, 2007

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