

Reconnecting with Nature

By : Gregers Reimann

Managing Director

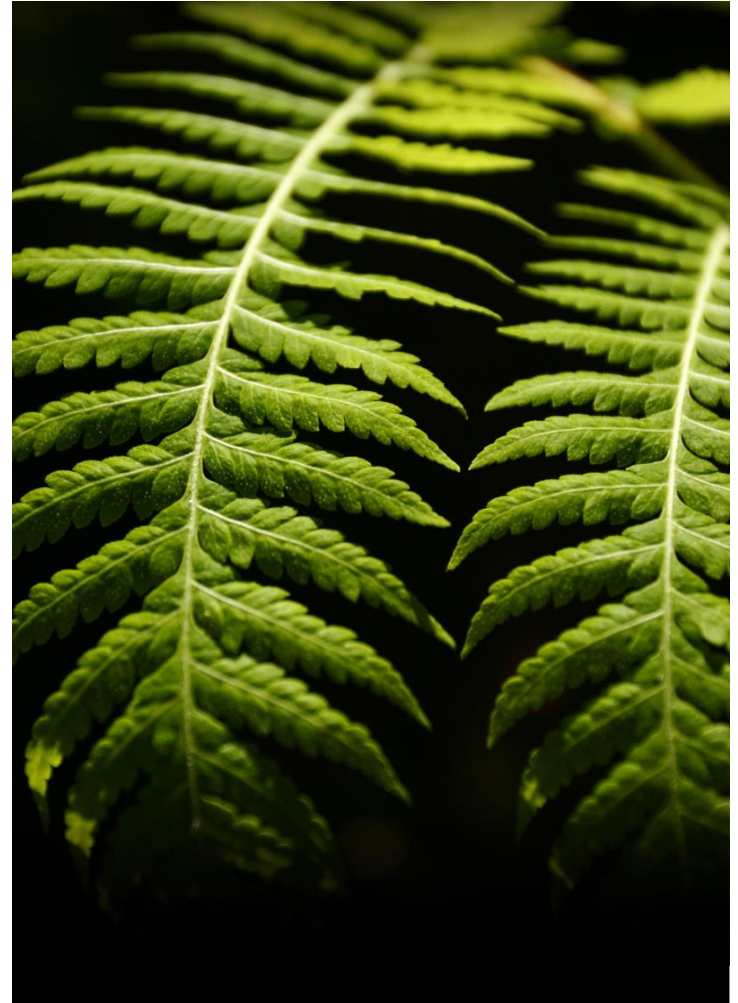
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- 2) We are 'hardwired' for biophilia
- 3) Biophilia and green rating tools
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What is Biophilia?

BIOPHILIA AS A CONCEPT



The concept of biophilia implies that humans hold a biological need for connection with nature on physical, mental, and social levels and this connection affects our personal well-being, productivity, and societal relationships. – *Sheeps Meadow*, 2004

Bio

connected with life and living things

philia

denoting fondness, especially an abnormal love for a specified thing

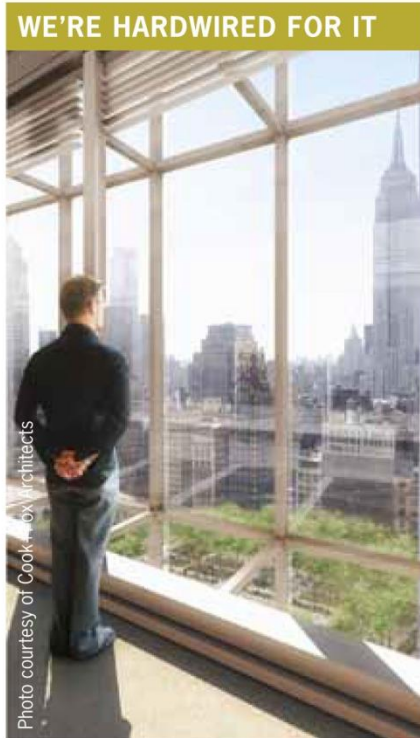
loosely translated as
Love of Nature

Biophilia is real



- **“What is the most attractive office space?”**
Along the façade with a view out
- **When asked to “Draw your favorite place”**
96% of the kids drew an outdoor location
- **20% more self-discipline**
for teenage girls with greenery outside their home

We are Hardwired for Biophilia...



Affective responses toward environmental settings are not mediated by cognition but stem from a rapid, automatic, and unconscious process by which environments are immediately liked or disliked... because of the hardwired emotional affiliation with certain natural elements, nature-based architecture can awaken fascination for natural forms – Joye, 2007

...yet, we spend **90%** of our time indoors

...so, better make it worthwhile through biophilic design

Examples of Biophilia



Fallingwater
by Frank Lloyd Wright



Kampung House
(Vernacular Malaysian Architecture)

Example of Biophilia (Malaysia)



Photo by Lin Ho

Paramit – factory in the forest

Architect: Design Unit
ESD: IEN Consultants

Nominee for "Best New Building of the World 2018"
RIBA International Prize

Example of Biophilia (Malaysia)



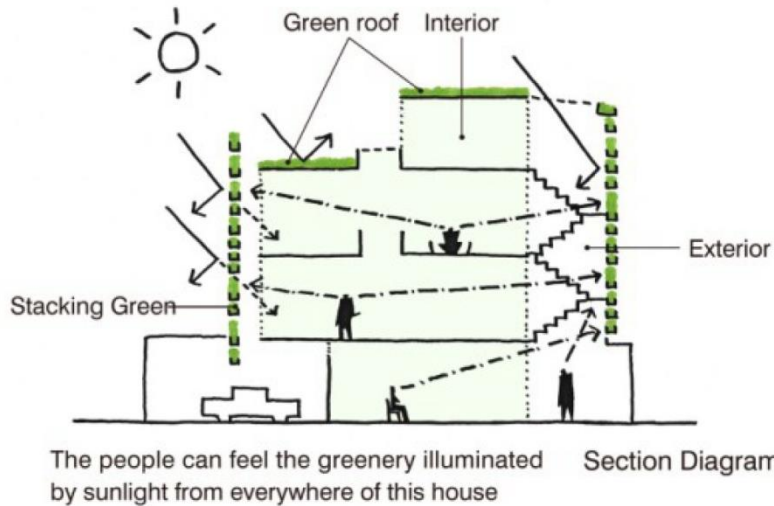
Photo by Lin Ho

Paramit – factory in the forest

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Nominee for "**Best New Building of the World 2018**"
RIBA International Prize

Example of Biophilic building (Vietnam)



Stacking Green

Greenery, daylight, air flow and views are important to this reinvented tube-house in Ho Chi Minh Vietnam, by architect Vo Trong Nghia. The award-winning project – without Green certification – addresses well being at the building and argues for the same at the urban scale.

Drawing by Vo Trong Nghia

Visual connection to nature & greenery from all rooms



Stacking Green
Vo Trong Nghia - Green façade
Image by Hiroyuki Oki



Stacking Green
Vo Trong Nghia - Daylit interior
Image by Hiroyuki Oki

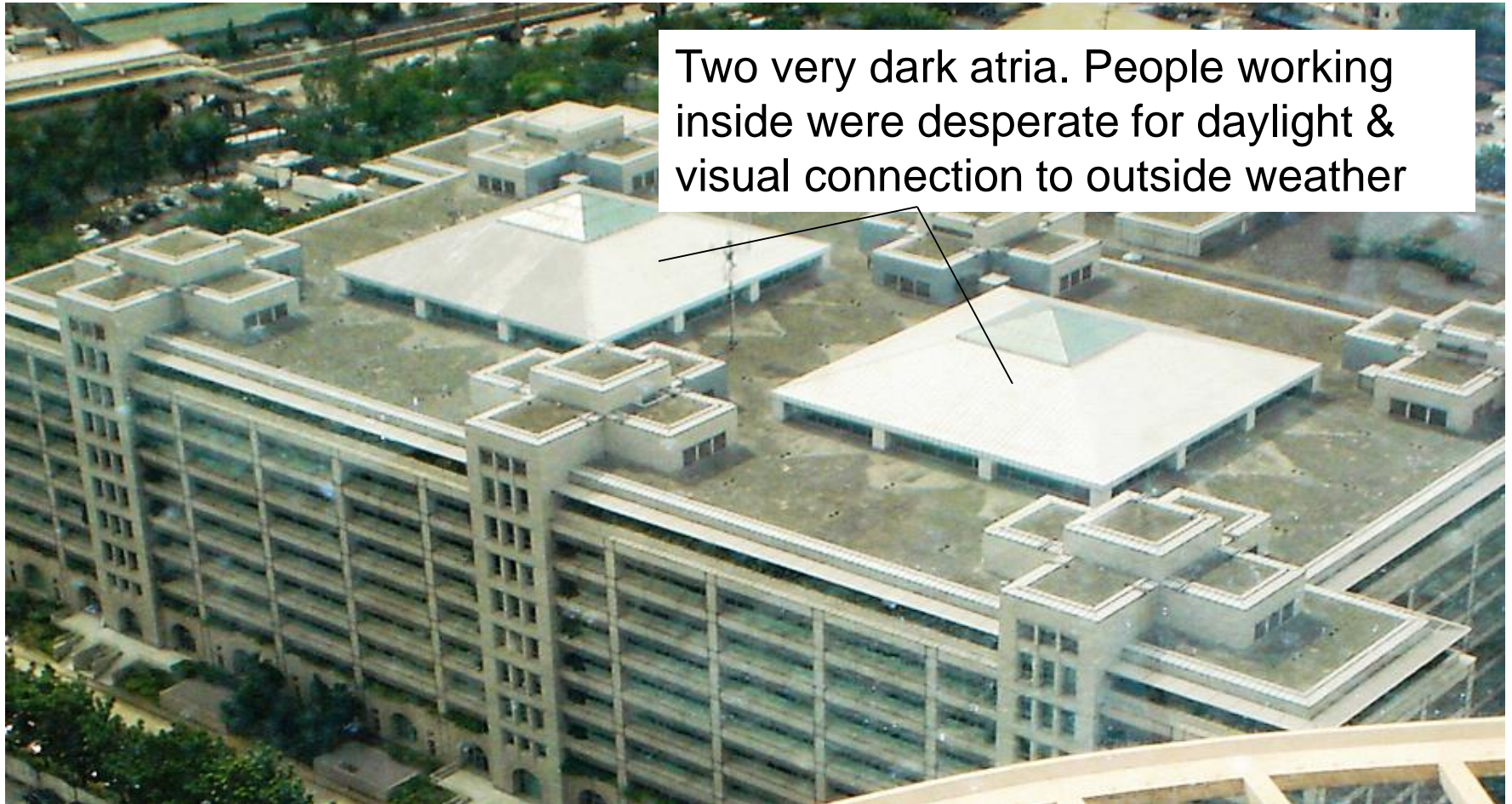
Example of Biophilia (Malaysia)



.... instead of being stuck in traffic

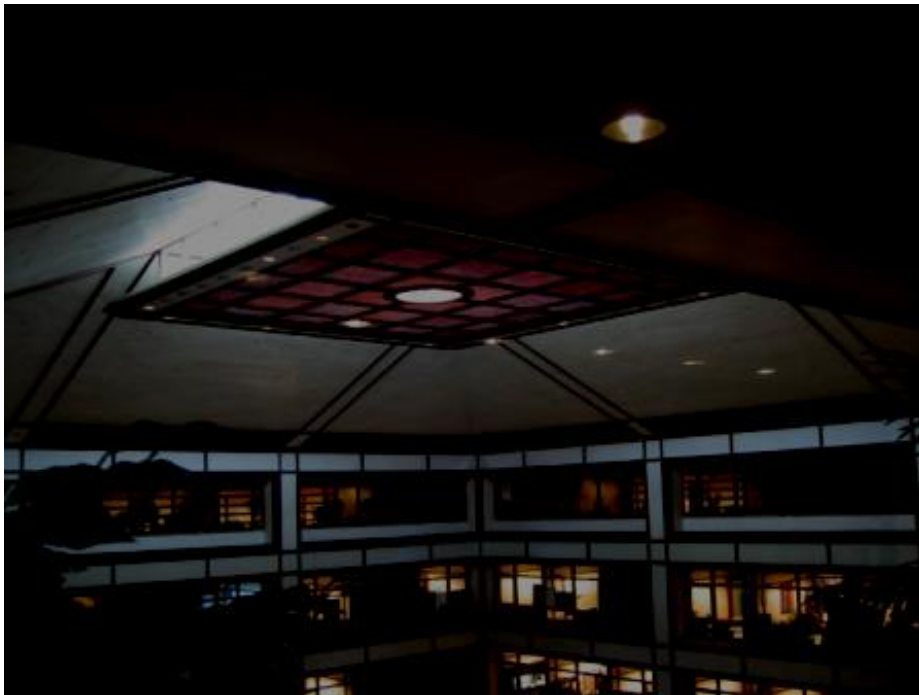
Commute in nature along river in Kuala Lumpur

Biophilic atrium retrofit case study: Asian Development Bank, Philippines



Biophilic atrium retrofit case study: Asian Development Bank, Philippines

BEFORE



AFTER



Survey after the retrofit showed that 92% of the occupants preferred the retrofitted atrium.

Only heard 1 complaint: "Give me even more daylight please!"

Biophilic elements in the Law

- “Right to Light” [UK law]

Right to light is a form of **easement** in **English law** that gives a long-standing owner of a building with windows a right to maintain the level of **illumination**. It is based on the **Ancient Lights** law.^[1] The rights are most usually acquired under the **Prescription Act 1832**. Neighbours cannot build anything that would block the light without permission.

Once a right to light exists, the owner of the right is entitled to "sufficient light according to the ordinary notions of mankind":

Colls v. Home & Colonial Stores Ltd (1904).

- Mandatory daylight requirement for work spaces [Danish law]

The daylight factor must be 2% or higher at workspaces



Biophilia in Green Building Tools?

Asian Green building tools reviewed

1. *Green Mark (Singapore): RB version 4.1 + NRB version 4.1*
2. *GBI (Malaysia): RNC version 1.02 + NRNC version 1.02*
3. *Greenship (Indonesia): All buildings, version 1.1*
4. *BERDE (Philippines): VRD version 1.1.0 (2013) + CB version 1.1.0 (2013)*
5. *Lotus (Vietnam): R version 2.0 + NR version 2.0*
6. *BEAM Plus (Hong Kong): All buildings, version 1.1 (2010.04)*
7. *CGBL(China): Residential version 2006 + Commercial, version 2006*
8. *EEWH (Taiwan): EEWH-RS version 2007 + EEWH-BS version 2007*
9. *TREES (Thailand): All buildings, version 1.1*
10. *CASBEE (Japan): All buildings, 2011 Edition*
11. *KGBC (South Korea): Multi-unit residential version 2002 + Others version 2002*
12. *GREENSL (Sri Lanka): All buildings, December 2010*
13. *GRIHA (India): SVA GRIHA, version 2013 + All buildings, version 3*
14. *LEED (India): All buildings, version 2011*

Study by: Kishnani et al. (2012)

Biophilia in Green Building Tools?

Findings of Asian Green building tools review

- All tools seem to say that greenery and water are important, but almost none link these to the occupant well-being
 - e.g. use greenery to reduce urban heat island effect, but not for biophilic purposes
 - e.g. harvest rainwater to reduce potable water, but not for biophilic purposes
- The tools are not deeply biophilic
- Biophilic principles are undervalued
 - missing
 - (mis)placed in a category other than well-being

Study by: Kishnani et al. (2012)

Biophilia in Green Building Tools?

Most and least biophilic tools

Percentage of achievable credits
that are linked to natural system
or biophilic features

1. Green Mark (Singapore): RB version 4.1 + NRB version 4.1
2. GBI (Malaysia): RNC version 1.02 + NRNC version 1.02
3. Greenship (Indonesia): All buildings, version 1.1
4. BERDE (Philippines): VRD version 1.1.0 (2013) + CB version 1.1.0 (2013)
5. Lotus (Vietnam): R version 2.0 + NR version 2.0 ←----- **Highest score 18%**
6. BEAM Plus (Hong Kong): All buildings, version 1.1 (2010.04)
7. CGBL(China): Residential version 2006 + Commercial, version 2006
8. EEWH (Taiwan): EEWH-RS version 2007 + EEWH-BS version 2007
9. TREES (Thailand): All buildings, version 1.1 ←----- **5% or less**
10. CASBEE (Japan): All buildings, 2011 Edition
11. KGBC (South Korea): Multi-unit residential version 2002 + Others version 2002
12. GREENSL (Sri Lanka): All buildings, December 2010 ←-----
13. GRIHA (India): SVA GRIHA, version 2013 + All buildings, version 3 ←-----
14. LEED (India): All buildings, version 2011 ←-----

Study by: Kishnani et al. (2012)

New WELL Certification

with credits for Biophilia (qualitative & quantitative)



International Insights

NEW TREND: HEALTHY BUILDINGS

"We shape our buildings, and afterwards our buildings shape us" These words, uttered by Winston Churchill during his speech at the House of Commons in 1943, are the very essence of a new trend that has emerged for buildings globally and in the Asian region.



With over 500 registered projects in over 30 countries, covering more than 100 million sq.ft, one third of which is located in Asia, the WELL Building Standard is making

being? The answer is no, only partially, and unlike WELL typically not as predominantly mandatory requirements. Most of the existing green building



by the immense financial logic of the WELL building standard. With attractive ROIs related to overall health care cost savings, worker productivity increases and reduced sick days and intangible benefits such as improved sales from better customer experience and increased work value produced by employees, the WELL building standard provides a great business case - one that in this region has been picked up very quickly by China, where WELL certification is highest outside of the US.

The WELL Standard addresses seven

a year and costing nations like Indonesia an estimated RM160billion [\$35 billion] in economic losses.

For most people living in cities, 90% of our time is spent indoors - be it at our workplace, home or even in the car stuck in traffic. Unfortunately for a lot of people, while being stuck in the office to avoid bad outdoor air pollution might sound like a good idea, the comfort of being indoors can be nothing but an illusion as concentrations of some pollutant indicators can be 2 to 5 times higher indoors compared to outdoors. In fact, we have had to invent the term "Sick

as studies issued under the Population Health Management Journal shows that eating unhealthily can be linked to a 66% increased risk of productivity loss. And Malaysia is the fattest nation in Asia with 42% of the population being overweight and 14% obese, in part because more than half of Malaysians have been reported to practice inactive lifestyles (defined as weekly exercise amounting to less than 150 minutes).

The WELL Building Standard looks at creating wellbeing at the workplace by setting forth preconditions that call for building owners to make available

About The Contributor



Sheena is in the process of joining the WELL Faculty while working as a green building consultant at iEPA Consultants



Gregers is the managing director of iEPA Consultants, the pioneering green building consultancy in Malaysia.

Let's do a WELL calculation example in the Malaysian context using our own office as an example, where 81% of our company's monthly expenditure goes to staff salaries, while other expenses (15%) and rental (4%) account for the rest of the expenses. From the employer's perspective, and under the assumption that by following the WELL standard, the absenteeism and presentism can

Article in Property Insight magazine (December 2017 issue)

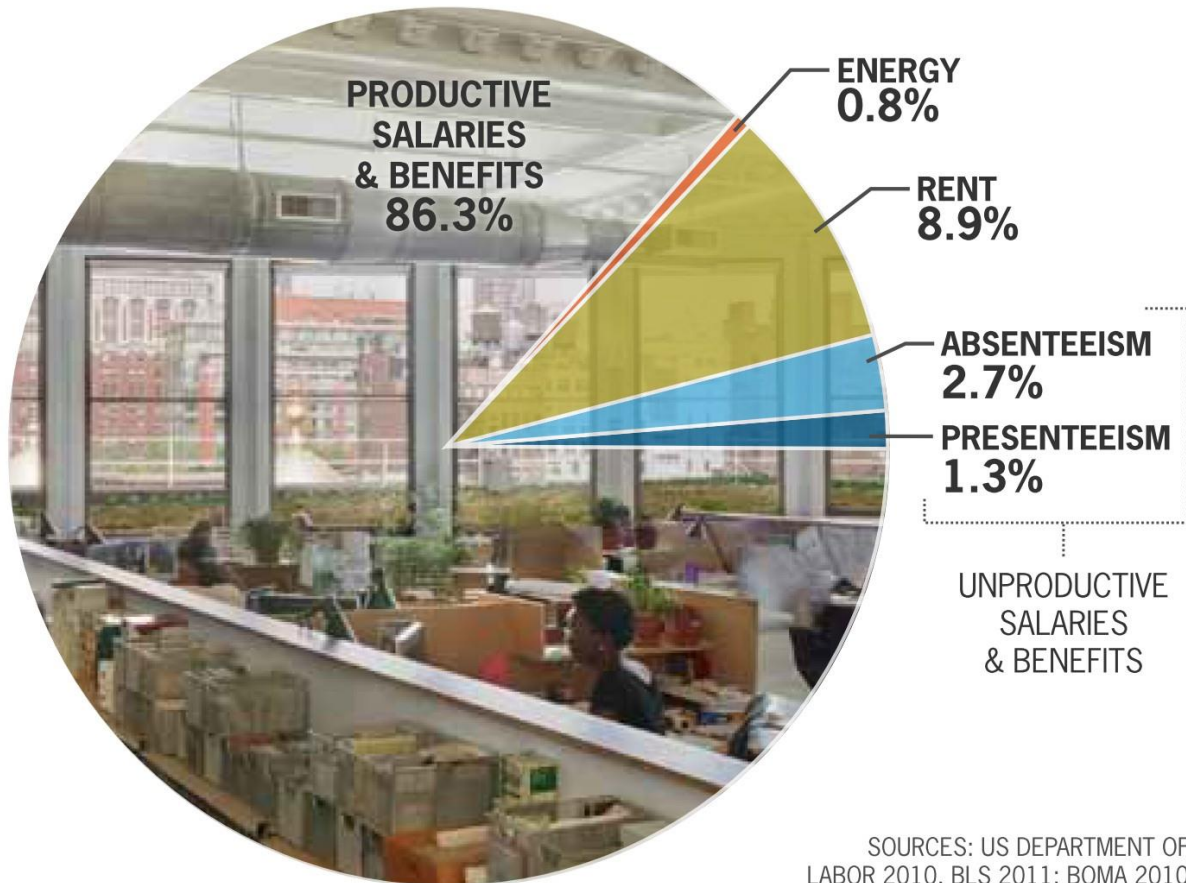


Biophilia & Economic Sen\$e



There's great economic value in the positive effects of biophilic design on well-being, stress reduction and enhanced learning

Biophilia & Economic Sen\$e



BIOPHILIA CAN RE-ENGAGE LOSSES FROM UNPRODUCTIVE OPERATING COSTS

More than 90% of a company's operating costs are linked to human resources, and **financial losses due to absenteeism and presenteeism account for 4%**. Commercial spaces that give occupants access to nature serve as a release to outside stresses, and tend to cause less environmental stress themselves. It makes fiscal sense for companies to try to eliminate environmental stress that cost them thousands of dollars per year in employee costs.

SOURCES: US DEPARTMENT OF LABOR 2010, BLS 2011; BOMA 2010

Graphics credit: Catie Ryan for Terrapin Bright Green

There's great economic value in the positive effects of biophilic design on well-being, stress reduction and enhanced learning

Unproductive 66 days per year!

Amount of time that average Malaysian worker is either absent or suffering from presenteeism

NB. The UK figure is only 30 days per year

**MOST EMPLOYERS DO NOT REALISE THAT
HEALTH IS WEALTH...**



**EMPLOYEES UNDER-PERFORMING IN POOR WORKING ENVIRONMENT DESPITE
81% OF COST ARE GOING TO SALARIES**

Biophilia & Economic Sen\$e

Biophilic retrofit of call center (Sacramento, US)

- Employees with a view to the outside could take 6-7% more calls than employees without a view
- The call center was retrofitted to give everybody a view out (more office space, different seating arrangement, operable windows)
- Cost: USD 1000 per employee
Savings: USD 2990 per employee
Payback time: **4 months**



Biophilia & Economic Sen\$e

Improved student learning

Windowless class
room test scores
dropped by
17%

CHILDREN
PROGRESSED
THROUGH SCHOOL
CURRICULA

20-26%

FASTER WHEN
LEARNING IN

DAYLIT

ENVIRONMENTS

Biophilia & Economic Sen\$e

Hospitals patients recover faster

HEALING VIEWS



Photo courtesy of G. Brändle, Agroscope

Patients with a view to nature, instead of a nondescript wall, are more likely to experience hospital stays that are 8.5% shorter, with fewer negative observational comments from nurses, and significantly fewer strong, post-surgical analgesics.
– Ulrich, 1984

**Patients can discharge
8.5% faster from hospital**



Khoo Teck Puat Hospital
(Singapore)

Biophilia & Economic Sen\$e

Significant increase in property value

PEOPLE WILL PAY

58%

MORE FOR A
PROPERTY WITH A
VIEW TO WATER

OR

127%

MORE FOR A
**LAKEFRONT
PROPERTY**



Photo courtesy of Cook+Fox Architects

Biophilia & Economic Sen\$e

Retail spaces

BIOPHILIA AND RETAIL



Retail customers judge businesses surrounded by nature and natural features to be worthy of prices up to 25% higher than businesses with no access to nature. – *Albee Square, Brooklyn, NY, 2010*

- Customers were willing to pay more for products when sold in a green retail setting:
 - +20% higher for convenient shopping (e.g. sandwich)
 - +25% higher for general shopping (e.g. jacket, watch)
- For a retail store chain in California with 73-stores, skylights were installed and sales increased by 40%



Daylit 'biophilic' buildings in Malaysia

The GEO office building, Greentech Malaysia HQ, Bangi



Blind encapsulated in double glazing, no maintenance needed. Looks as good as new after seven years and counting....!

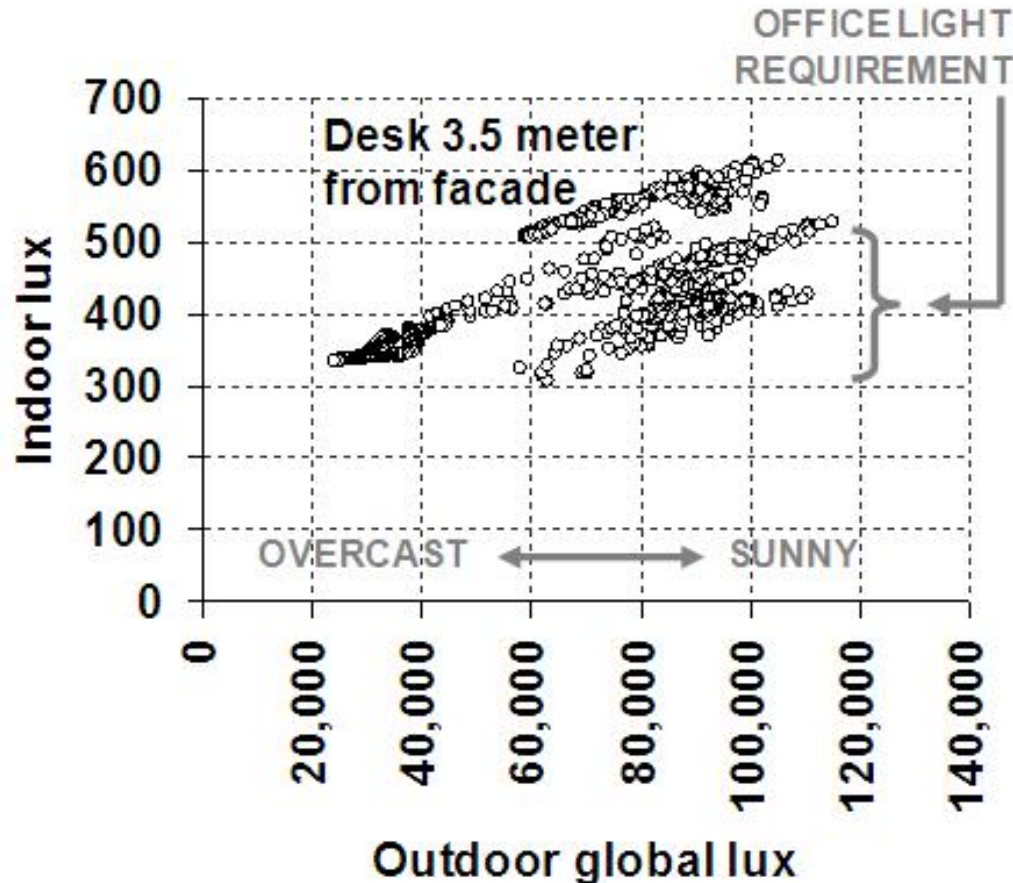


Daylight design by IEN Consultants

Semi-specular tannenbaum reflector in the ceiling. Maintains inward light reflection without causing glare to the occupants. Translucent cubicle walls parallel to the façade ensures daylight passage to table top.

Daylit 'biophilic' buildings in Malaysia

The GEO office building, Greentech Malaysia HQ, Bangi



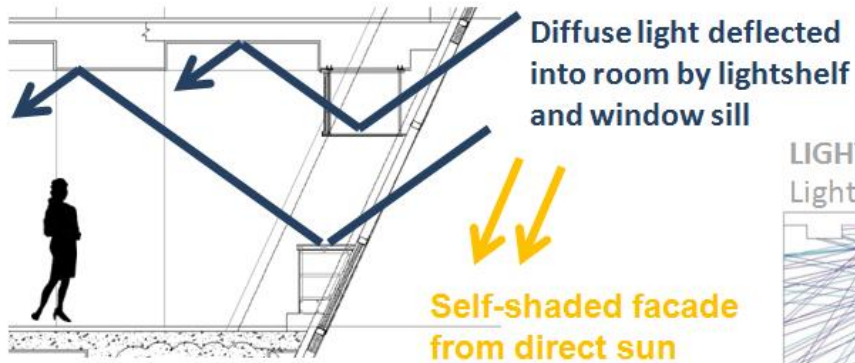
1. Occupants prefer working in daylight
2. Electrical lighting consumption is 25 times lower than the code requirement



Measured lighting consumption during office hours is only 0.56 W/m²

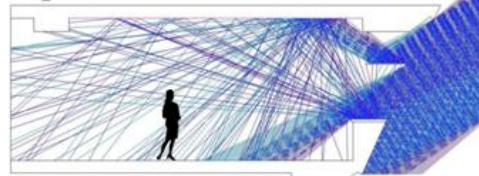
Daylit 'biophilic' buildings in Malaysia

The ST Diamond building, Putrajaya

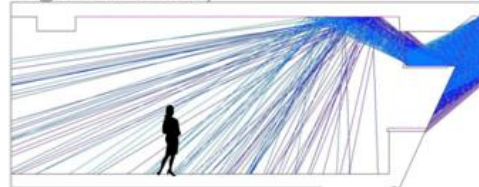


FACADE

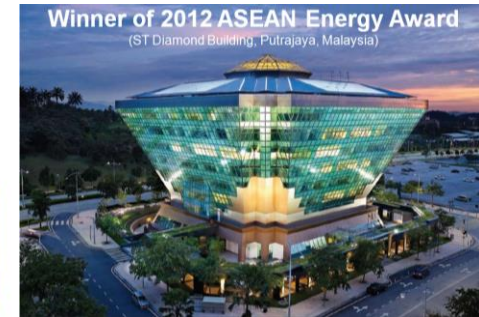
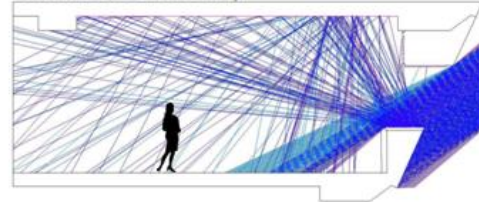
LIGHT REFLECTIONS FROM:
Lightshelf + Window sill



Lightshelf only



Window sill only



Fixed louvers allows daylight to enter and blocks glare

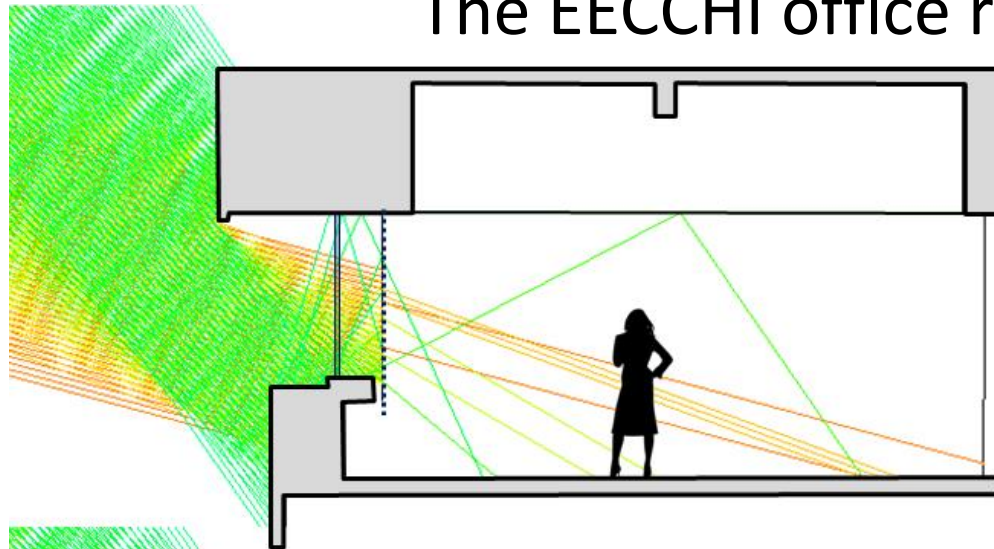
Daylight and view to outside preserved

Façade Daylight Design

The building is 50% daylit. The façade daylighting system consists of a mirror lightshelf and a white painted window sill. Both deflect daylight onto the white ceiling for improved daylight distribution until 5 meters from the façade + 2 additional meters of corridor space. Installed office lighting is 8.4 W/m², but 1-year measurements show consumption of only **0.9 W/m²** showing high reliance on daylighting

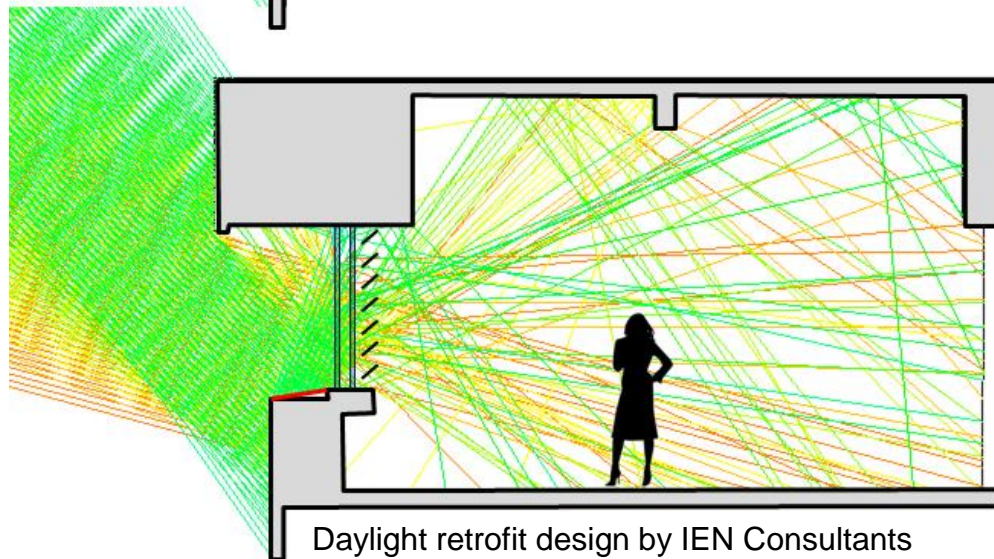
Daylit 'biophilic' building in Indonesia

The EECCHI office retrofit, Jakarta



BEFORE RETROFIT

- Vertical blinds blocking most of the daylight
- Suspended ceiling



AFTER RETROFIT

- Mirror lightshelf on external ledge reflecting diffuse daylight onto the high ceiling (suspended ceiling removed)
- Perforate venetian blinds
- Extra window pane

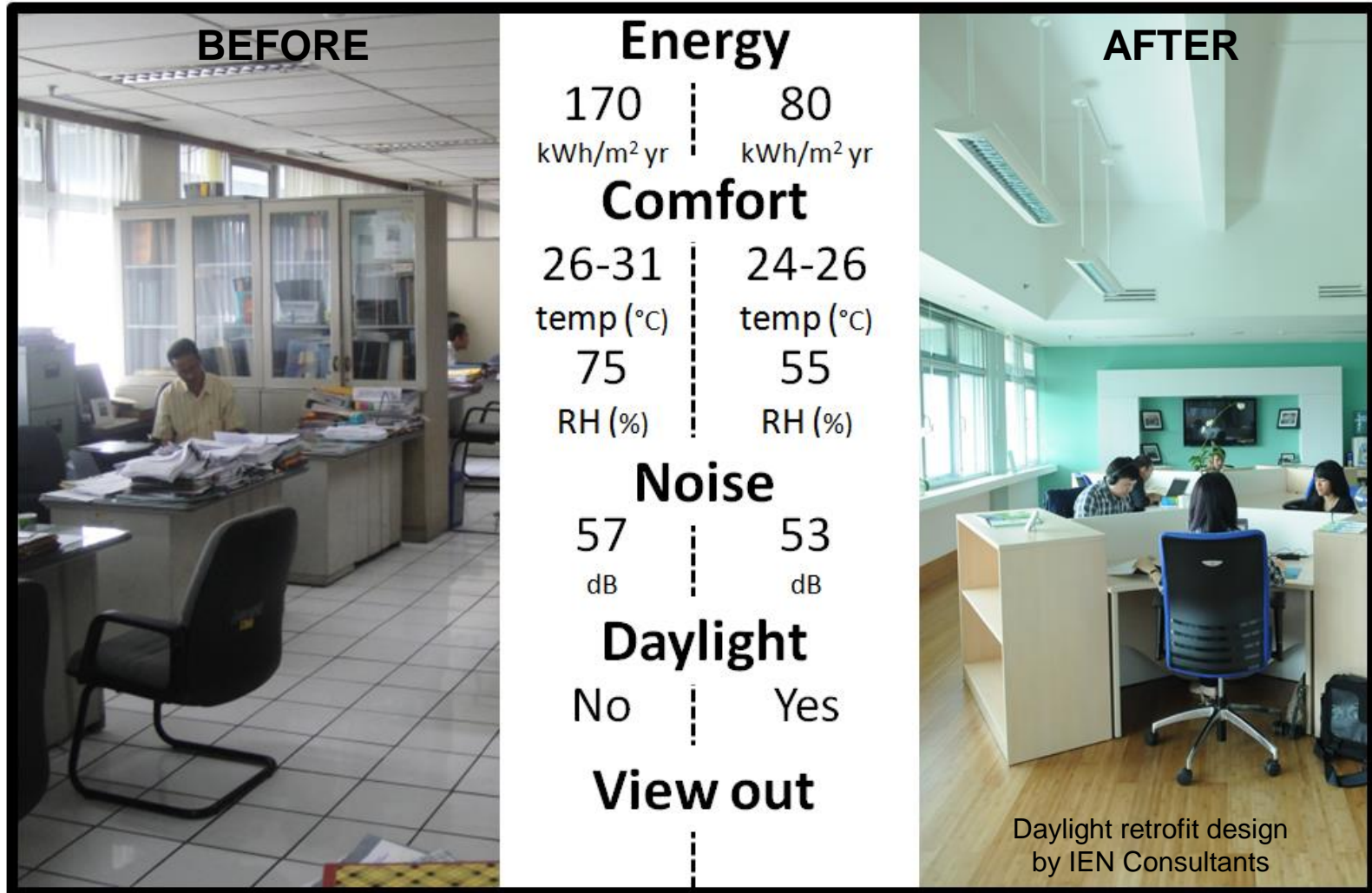
Daylight retrofit design by IEN Consultants

kWh/m² year



Daylit 'biophilic' building in Indonesia

The EECCHI office retrofit, Jakarta



Daylit 'biophilic' building in Malaysia

The MMK high rise office, Damansara Perdana

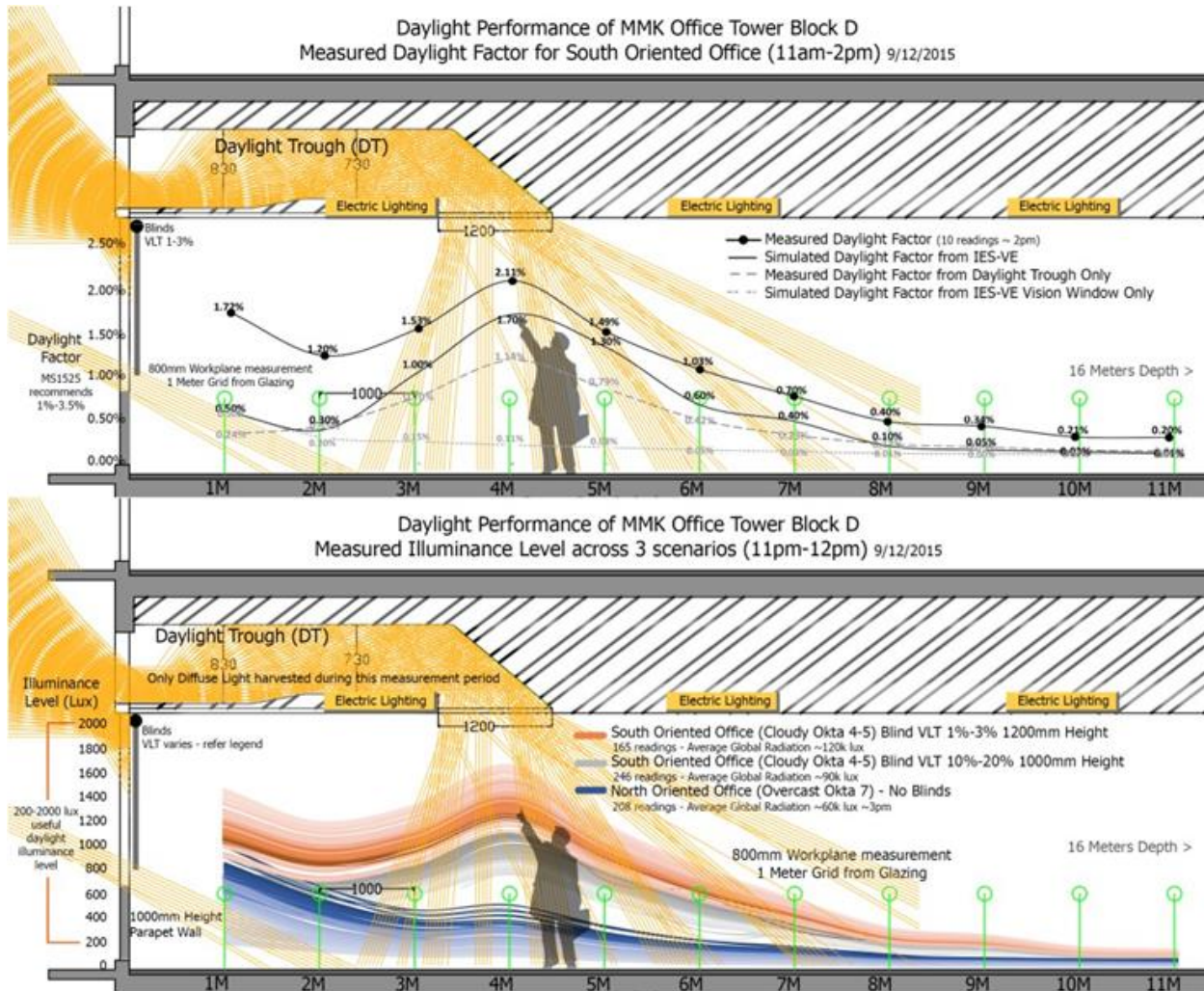
**Innovative
daylight duct
from facade**



Daylight design by IEN Consultants

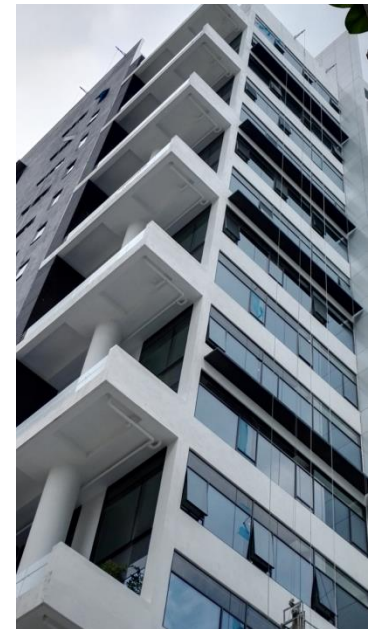
Daylit 'biophilic' building in Malaysia

The MMK high rise office, Damansara Perdana



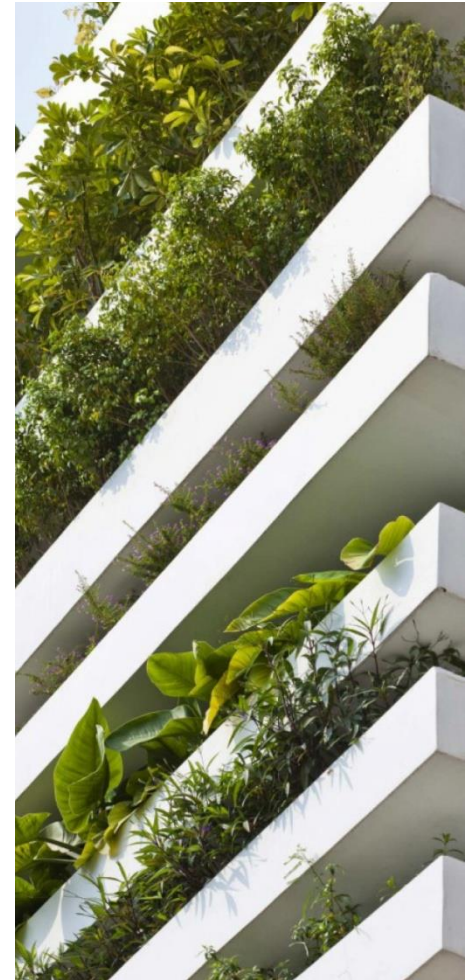
Daylight design by IEN Consultants

Measured daylight show that the first **7 meters** can be daylit, even when the blinds are fully engaged



Concluding remarks

- Humans are naturally drawn to nature
- Biophilic design is important
- Biophilic design make economic sen\$e
- Biophilic design is arguably under-represented in green building tools in Asia
- Several good examples of built environment allowing occupants connecting with Nature



Thank you



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