



**ADEME**



Agence de l'Environnement  
et de la Maîtrise de l'Energie

# LETCHI INTERNATIONAL PROJET Table ronde CAUE

REGULATORY FRAMEWORK FOR ENERGY  
EFFICIENCY IN BUILDINGS:  
INDIA, SRI LANKA, THAILAND AND VIETNAM

04 Juillet 2016  
Saint-Pierre, La Réunion



# INDIA: National Building Code 2005

- Promotes solar passive design: “Appropriate solar passive methods, such as orientation, double-glazing, trombe walls and solar collectors, shall be adopted to achieve climatic comfort with little use of conventional energy.” (Part 3, pg.62)
- Promotes the use of new and innovative materials and methods in building technology, taking into account “Impact of production of building materials on the consumption levels of natural resources.” (Part 5, pg.3)
- Address heat insulation: “For calculation of solar radiation on buildings and recommended limits of thermal transmittance of roofs and walls for different parts of the country and heat transmission losses due to different constructions, reference may be made to good practice” (Part 3, pg.35)

Source:<http://www.cseindia.org/content/national-building-code-2005>

# Energy Conservation Building Code 2007 (ECBC)

- Baseline code, part of it addresses passive design.
- It is referred to by green rating systems in which the passive design component of ECBC is mandatory.
- Sets minimum energy standards for
  - connected load of 500kW+ or contract demand of 600KVA+ or Air conditioned area of 1000 sq.mt+
- Code addresses
  - building envelope, HVAC
  - interior and exterior lighting
  - hot water
  - electrical power
  - motors

# THAILAND: BUILDING ENERGY CODE (BEC)

- Ministry of Energy
- Overall Thermal Transfer Value (OTTV)
- Roof Thermal Transfer Value (RTTV)
- Lighting Power Density (LPD)
- Cooling Efficiency (kW/ton or EER)
- Whole Building Energy Calculation (kWh/yr)
- Mandatory for new government buildings.
- Mandatory for new large commercial project.



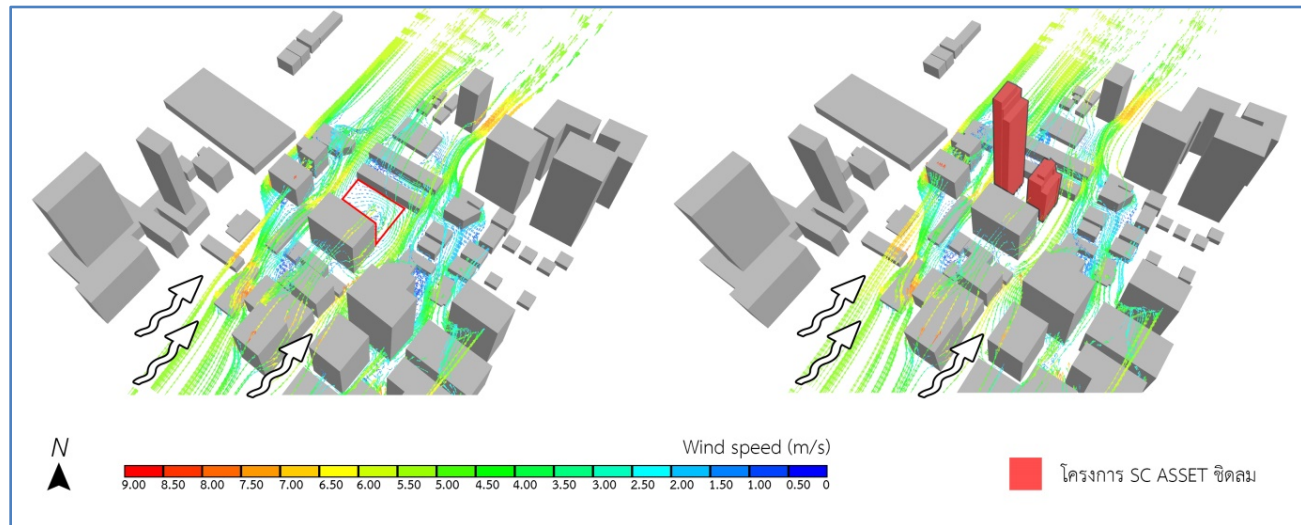
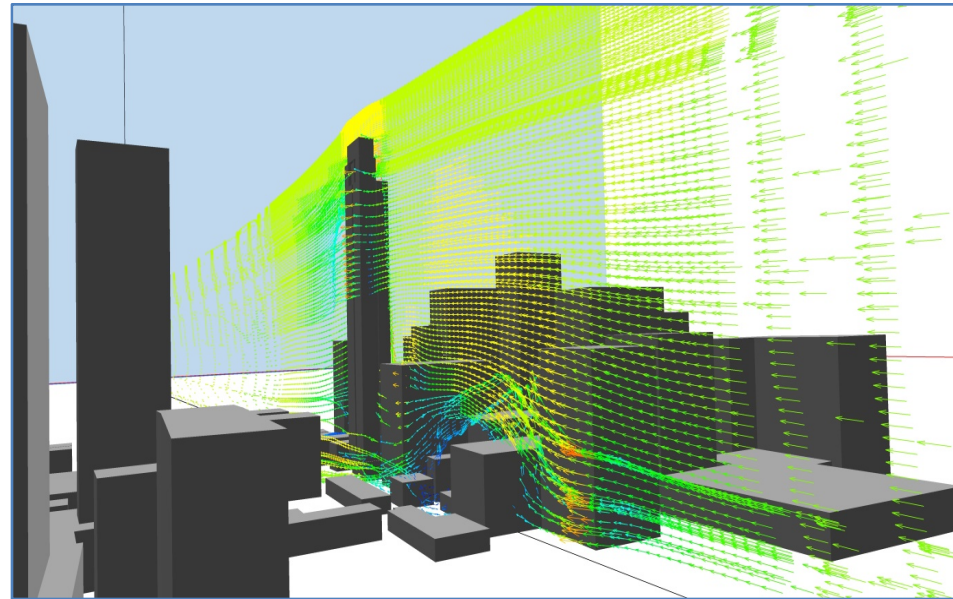
# OTTV/RTTV

Type of Building	OTTV (Watt/m <sup>2</sup> )
(a) Educational facility, Office	50
(b) Retail, Shopping center, Convention center	40
(c) Hotel, Hospital, Condominium	30

Type of Building	RTTV (Watt/m <sup>2</sup> )
(a) Educational facility, Office	15
(b) Retail, Shopping center, Convention center	12
(c) Hotel, Hospital, Condominium	10

# Environmental Impact Assessment (EIA)

- Ministry of Natural Resource & Envir.
- Large residential project (> 4,000 m<sup>2</sup>)
- Large commercial complex (> 10,000 m<sup>2</sup>)
- Wastewater
- Garbage
- Traffic
- Green area (sustainable green area)
- Energy efficiency (OTTV, RTTV)
- Airflow study
- Light Reflectance
- Overshadowing

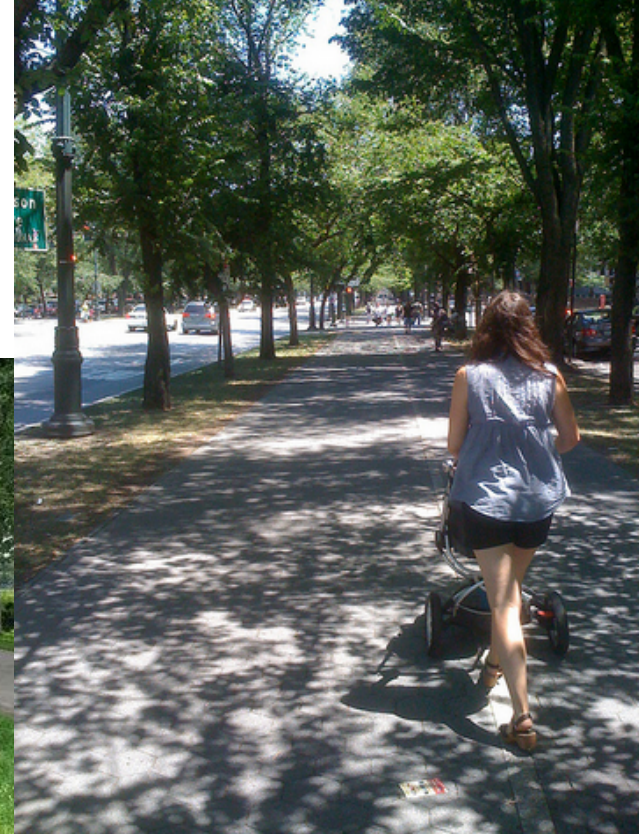


# NHA ECOVILLAGE



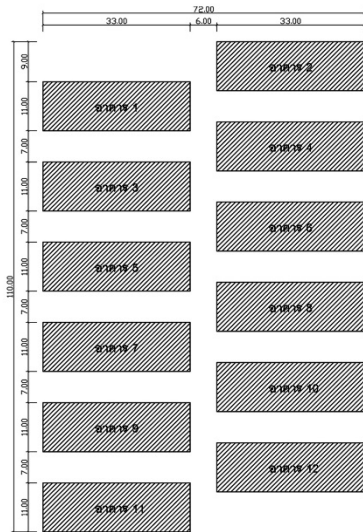
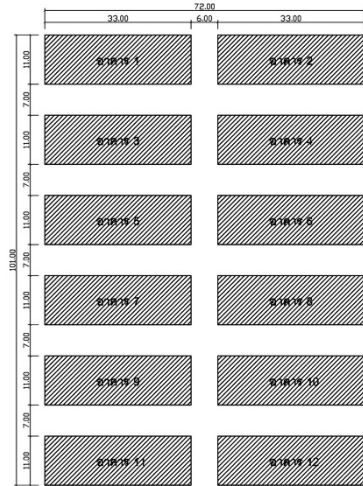
SITE PLANNING & LANDSCAPE	28 points
BUILDING DESIGN	42 points
BUILDING SYSTEMS	15 points
PROJECT MANAGEMENT	10 points
INNOVATION	5 points

**TOTAL = 100 points**





# Wind Orientation (1 point): Overlapping

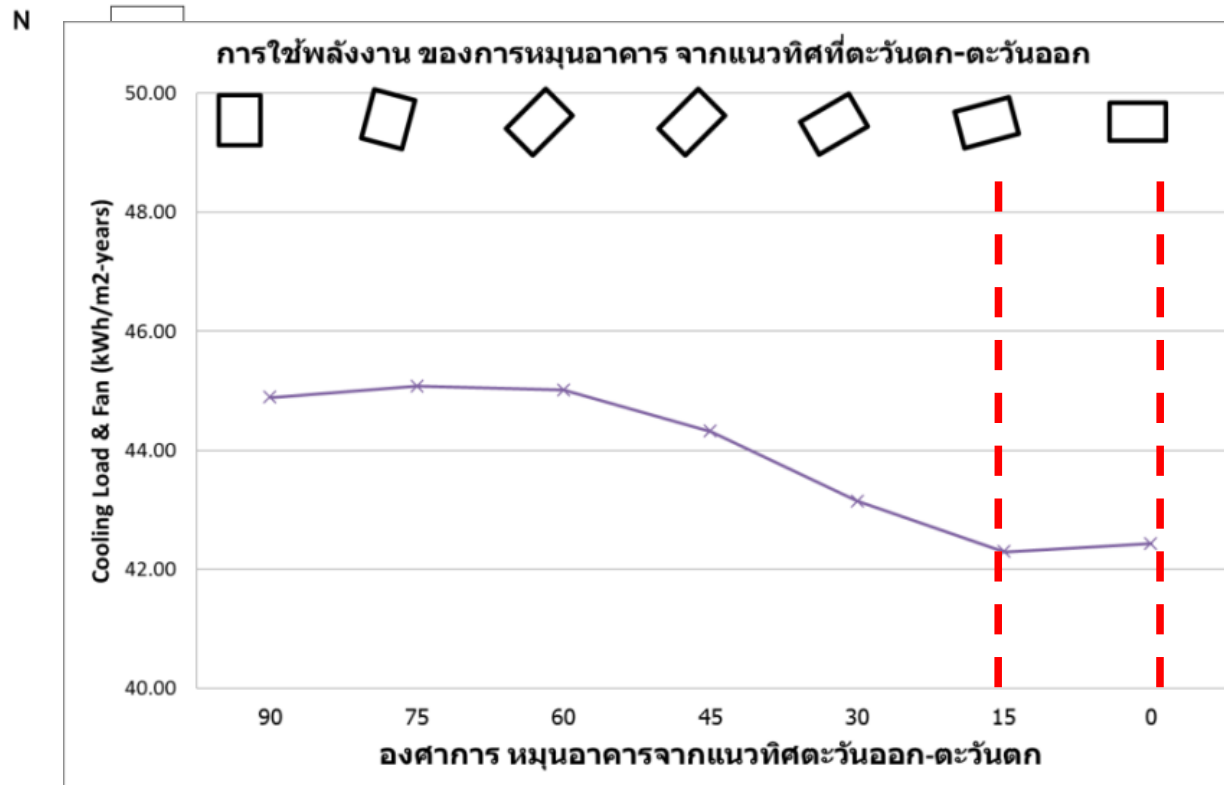
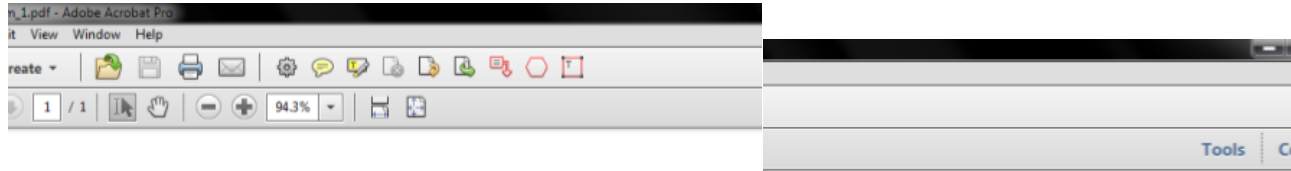






# SOLAR ORIENTATION (1 point)

<15 degree from south, 75% of all buildings





# RULE & BUILDING CODE SYSTEM

## LAWS

**Construction law** No. 50/2014/QH13  
**Urban planning law** No. 30/2009/QH12  
**Housing law** No. 56/2005/QH11

## DECREE

**Regulations of new urban area** Decree No. 02/2006/NĐ-CP  
**Urban Planning, Architecture, and Urban design management** Decree No. 38/2010/NĐ-CP

## CIRCULAR (mandatary)

**Regulation on Non-baked wall ration** Circular 09/2012/TT-BXD  
 From 2012: All the state budget buildings: at least 50% non baked material.  
 From 2015, Building over 9 floors: at least 30% non-bake material.  
 After 2015, Building over 9 floors: 100% non-baked light materials.

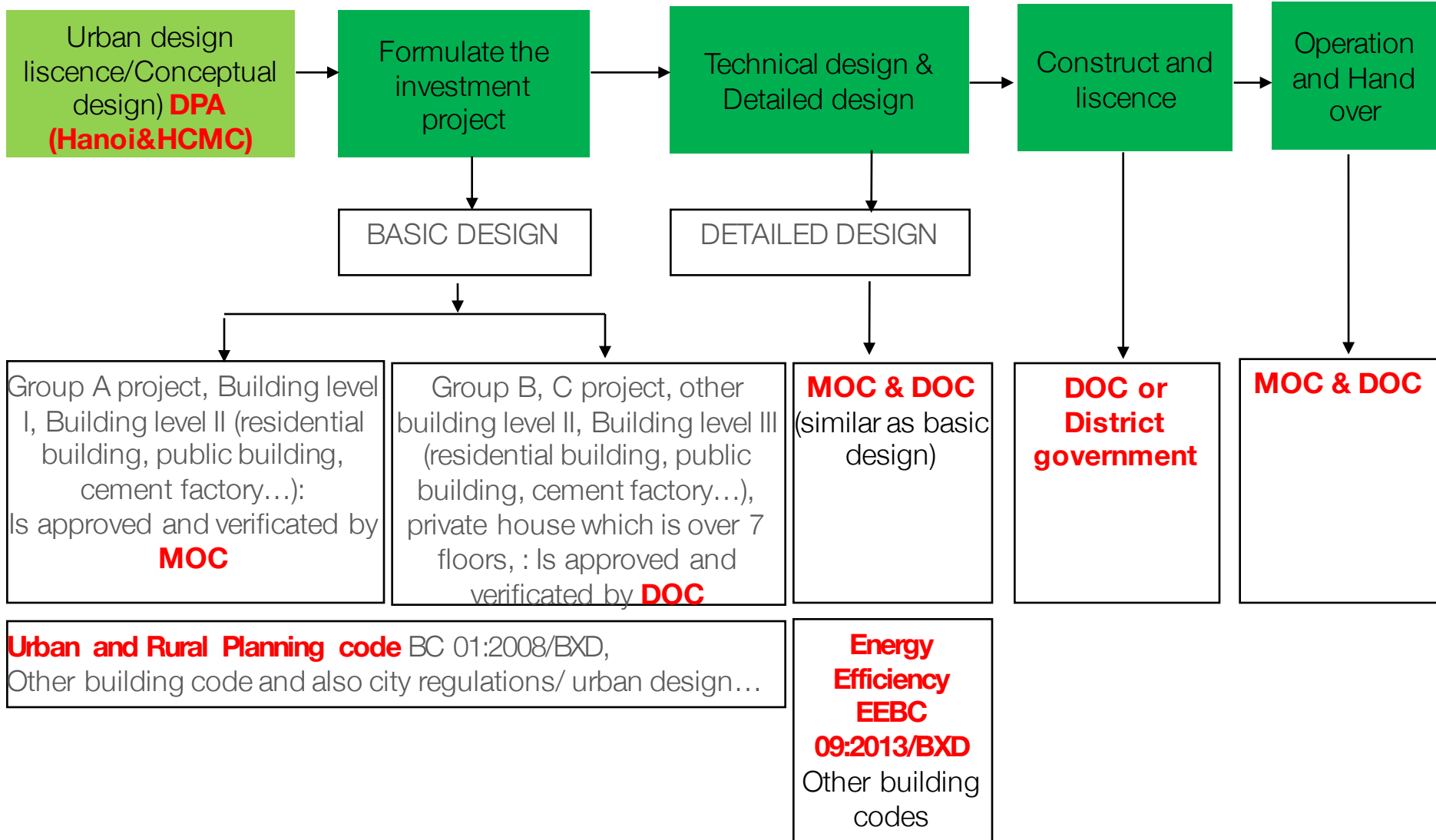
## BUILDING CODES (mandatary)

**VIETNAM BUILDING CODE BC 01 – 18**  
**Urban and Rural Planning code** BC 01:2008/BXD  
**Natural Physical & Climatic Data for Construction** BC 02:2009/BXD  
**Energy efficiency building code** EEBC 09:2013/BXD

## OPTIONAL TOOLS (It is not regulations/laws)

**Green building tools: Lotus** VGBC/ **Leeds** USGC/ **Edge** IFC/ **Breem** UK / **Green star** Singapore/ **CTX** MOC research

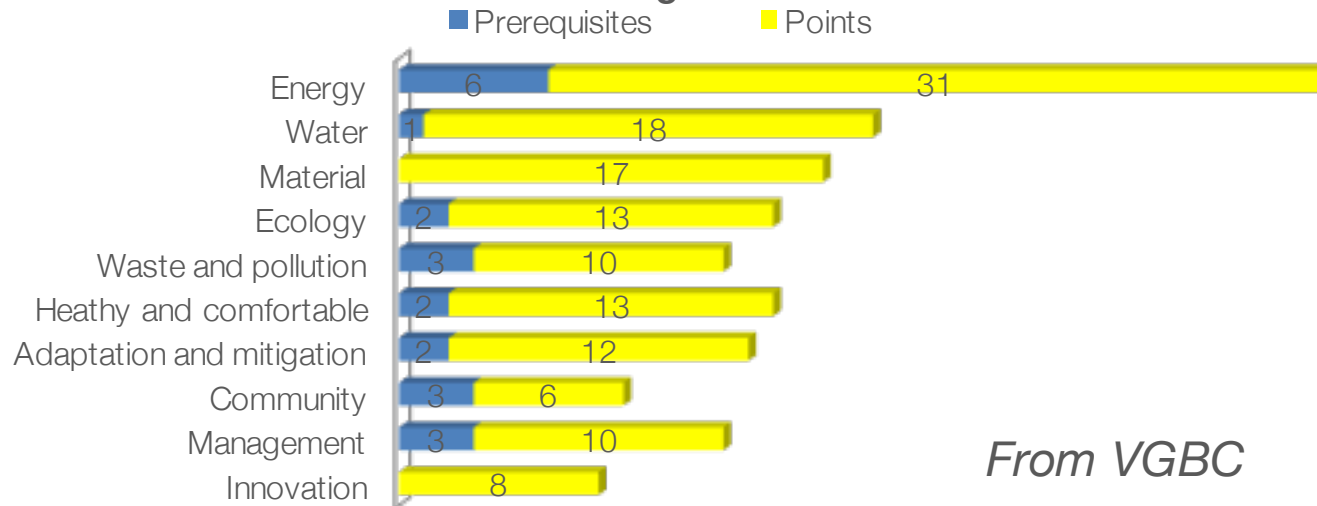
# BUILDING CONSTRUCTION PROCESS



# GREEN BUILDING TOOLS

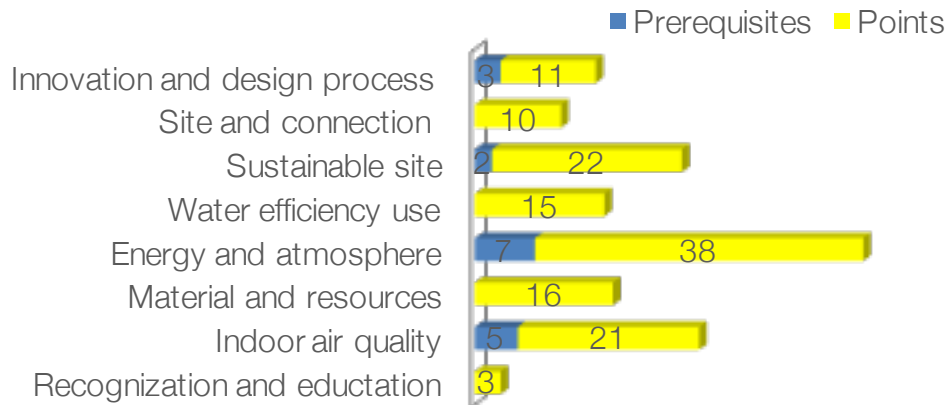
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## Lotus - Green building lotus



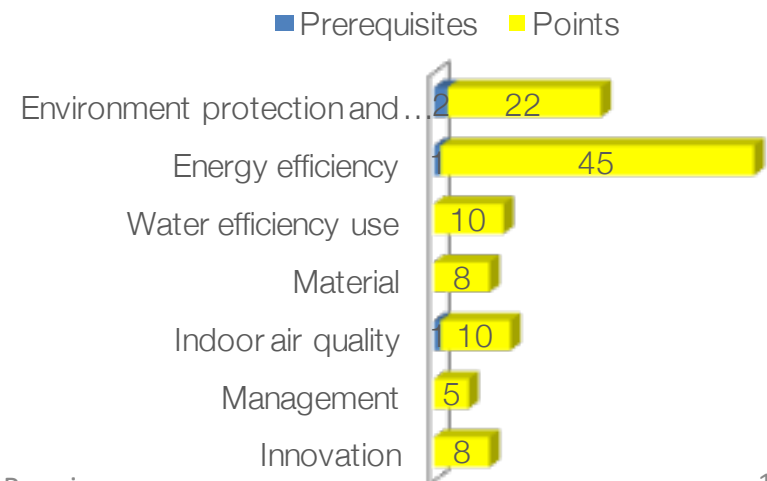
*From VGBC*

## Green building rating tool - LEED for Homes



*From USGC*

## MOC 's green building rating tool



# SRI LANKA: Building codes and legal framework

- a. UDA Planning and Building Regulations – formulated under the - Urban Development Authority Act, No. 41 of 1978 and subsequent revisions
- b. Energy Efficient building Code within the purview of - Sustainable Energy Authority Act, No. 35 of 2007

Although the legal framework encompasses many areas of urban development and housing, among others the key acts are as defined above.

These implicitly apply to concepts of passive design.

# Energy Efficient Building Code (EEBC)

## Energy Efficient building Code within the purview of - Sustainable Energy Authority Act, No. 35 of 2007

Currently, the EEBC exists as a voluntary code of practice. The EEBC is independent of the UDA planning and building regulations discussed above, therefore not incorporated into the compliance process for buildings in Sri Lanka.