Green Building Council Indonesia
Towards Indonesia’s Sustainable Future through Sustainable Building and Construction

Presented by Naning Adiwoso
Reported by Prasetyoadi and Savitra
The security of people and nations rests on four pillars - food, energy, water and climate. They are all closely related, and all under increasing stress.
Green Building Council Indonesia

Why Green Buildings?

End-use purposes
- Heating
- Water heating
- Cooling
- Lighting
- Others

United States
Australia
Canada
India

Commercial

Rural, China
Urban, China
United States
India
Australia
Canada
Kuwait

Residential

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GHG Emission Reduction Potential by Sector

Source: IPCC, assessment of emission reduction potential in different sectors depending on the carbon market price
<table>
<thead>
<tr>
<th>City</th>
<th>Energy Insecurity</th>
<th>Water Scarcity</th>
<th>Climate Change (Floods/Droughts, Storms, Sea Level Rise)</th>
<th>City Vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mumbai</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Kolkata</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
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<tr>
<td>Delhi</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Hyderabad</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Chennai</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Jakarta</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Kuala Lumpur</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Metro Manila</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Bangkok</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Ho Chi Minh City</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Consequence for Building Owner</th>
<th>Timeframe of Impact on a New Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storm damage</td>
<td>Increase in frequency and severity of storms will lead to more storm damage. Buildings will require more repair and maintenance work.</td>
<td>0-5 years and beyond</td>
</tr>
<tr>
<td>Geotechnical problems</td>
<td>Ground movements may increase in some areas due to increased drying of soil; repair and underpinning work will be needed for affected constructions.</td>
<td>0-5 years and beyond</td>
</tr>
<tr>
<td>Flood damage</td>
<td>Vulnerable buildings will face increased risk of flooding. Affected buildings will require extensive repair.</td>
<td>0-5 years and beyond</td>
</tr>
<tr>
<td>Corrosion of metals</td>
<td>Corrosion of metal components from water damage may increase, and thus buildings will require more repair and maintenance.</td>
<td>5-10 years and beyond</td>
</tr>
<tr>
<td>Degradation of plastics and rubbers</td>
<td>Plastics will degrade faster due to increased UV-B levels. Maintenance and replacement cycles will need to be more frequent.</td>
<td>5-10 years and beyond</td>
</tr>
<tr>
<td>Degradation of surface coatings</td>
<td>Surface coatings will degrade faster due to increased UV-B levels. More frequent maintenance will be required.</td>
<td>5-10 years and beyond</td>
</tr>
<tr>
<td>Rain penetration and water damage</td>
<td>Rain penetration problems will increase. Affected buildings will require repair and, where possible, corrective action.</td>
<td>5-10 years and beyond</td>
</tr>
<tr>
<td>Higher summer temperatures</td>
<td>Lead to a significant increase in the demand for air conditioning in buildings (and hence in higher summer energy demand). Higher ground temperatures would also lead to ground contaminants becoming more active.</td>
<td>Major effects 10-20 + years</td>
</tr>
<tr>
<td>Durability of concrete</td>
<td>Concrete may carbonate more quickly due to higher CO₂ levels in the atmosphere; this and other mechanisms may lead to cracking problems with concrete elements. Vulnerable components will require monitoring, and repair where necessary.</td>
<td>Major effects 10-20 + years</td>
</tr>
<tr>
<td>Increased rates of coastal erosion</td>
<td>Sea level rise and storm surges will have catastrophic consequences for buildings in vulnerable locations.</td>
<td>Storm surges 0-5 years and beyond; sea level rise major effects 10-20 + years</td>
</tr>
</tbody>
</table>

“Adapting to climate change: It really is time for action...GBCI are on a never-ending road; this is with us for the rest of our natural lives”
The happening....

2000 air is the problem

2010 water shortage

2020 energy crisis

2030 “the challenge” should be able to make the climate like 1992 and carbon neutral or ZERO CARBON
Adaptation involves finding ways to protect people who are vulnerable to climate impacts through “Green Building”.

**What is ‘green building’ in Indonesia?**

Green Building Council Indonesia do the actions........

inception – design – construction – commissioning - operation
that is … Growing Sustainability

for the effort toward green building, there are four overall guiding principles which have been developed since pre-industrial’s non fossil fuel era:

Engaging Sun, Soil, Water and Air

- **Sun**: reduce the fossil energy consumption by increasing passive cooling and day lighting, as well as electricity generation
- **Soil**: reduce waste, increase land use effectiveness and efficiency
- **Water**: reduce water consumption by increasing water reuse and collection
- **Air**: reduce building sector related air pollution, increase indoor air quality and natural ventilation
Benefit of Green Building

- Healthy and Safety
- Environmental
- Economic
- Community & Social Interaction
- Productivity

Building Value vs Building Performance:
Building value: No significant data that the value increase after green building certification, BUT they get benefit from saving on operating cost → building performance

Do Green Building Make Us Better People?
Green Building Council Indonesia

"green operational in building"

**COST TRANSFER**
- Total cost same
- Mechanical cost less
- Invest in Architecture
- Active to passive
- Fragile to robust
- Longer life
- Less cost over life
- Simpler

Source: WRI Report 2010
The Benefits

The Future of Buildings

- Carbon Reduction
  - Existing Buildings
  - Zero Carbon Buildings
  - Zero Carbon Networks
- Water Use Reduction
  - Reduce/Reuse
- Material and Waste Reduction
  - Building Recyclability
  - Embodied Waste
- Development
  - Low Income Housing

"It is clear that there will be increasing demand for sustainable designs around the world, from low energy buildings to carbon neutral cities."

Source: WRI Report 2010
Green Building Council Indonesia

The Benefits

GBC Indonesia will be the pioneer of new model of management change, that integrates economic, social and environmental consideration.

Source: WRI Report 2010
Millions of green jobs already exist in industrialized countries, emerging economies and developing countries. i.e.: In energy supply – renewable sources of energy, energy efficiency – particularly in buildings and construction

A worldwide transition to energy-efficient buildings would create millions of jobs as well as “green” existing employment for many of the estimated 111 million people already working in the construction sector. (ILO 2008)
Green Building Council Indonesia

- Not for profit organization
  - Established: April 2008
  - 7 initiators
  - 50 professional and practitioner as a core founder
  - Developer, designer, architect, building & facility management, contractor, structure engineers, mechanical & electrical engineers, landscapers, supplier, and etc.
  - Recognized by World Green Building Council
GBCI Founding Member

- CORE FOUNDER
- CORPORATE FOUNDING MEMBER
- GOVERNMENT INSTITUTION:
  - INDONESIA RESEARCH AND SCIENCE INSTITUTE (LIPI)
  - PROFESSIONAL ASSOCIATION AND INSTITUTIONS
  - MEDIA
Green Building Council Indonesia

Corporate Founding Member

• Developer:
  – Summarecon
  – Agung Podomoro
  – Agung Sedayu
  – Ciputra
  – Intiland Development
  – Springhill Group
  – Artha Debang
  – BSDCity (Sinar Mas Group)
  – Pikko Group

• Contractor:
  – Total Bangun Persada
  – Pembangunan Perumahan (PP)

• Energy:
  – Pertamina
  – PLN
  – Medco Energy

• Industry/Supplier:
  – Surya Toto
  – ICI
  – Dusaspun
  – Sumalindo
  – Phillips
  – Holcim
  – Lyman Group
Ensuring Indonesia’s Sustainable Future

GBC Indonesia’s Mission

- Promote & Stewards market transformation
- Educate the industry & public
- Forums for Industry dialog
- Builds Community
- Provides tools & expertise

“Ensuring Indonesia’s Sustainable Future”
GBC INDONESIA

as a market transformation agent and the drivers

- Rising energy costs
- Client demand
- ‘Measurability of green’

General motives

- Business reasons
- Environmental reasons
- Societal reasons

- Upfront cost
- Lack of education + awareness
- Lack of cohesion

- Environmental conditions
- Government regulation
- Advocacy + Education

Source: Green Building Market Report 2007
Green Building Council Indonesia encourage

Transform the market beyond of:

- Increased construction legislation
- Thermal performance regulation
- Design for carbon savings
- Modern methods of construction
- Implementation of low carbon & renewable energy technologies

Then, people will realize that for the next 5 years, green concept will be normal in general practices.
# Green Building Council Indonesia

## GBC Indonesia 10-years Vision(s) According to the Discussions with the Business Plan Team...

<table>
<thead>
<tr>
<th>By the end of 2012...</th>
<th>By the end of 2015...</th>
<th>By the end of 2019...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• GBC’s local initiative formalization &amp; Nationwide acknowledgment;</td>
<td>• The main actor in paradigm shifting, thus the biggest &amp; the most respectable promoter of the Sustainable Development;</td>
<td>• Endorsing at least one (1) Green City in Indonesia, and several areas as the Green Neighborhood;</td>
</tr>
<tr>
<td>• The one and only institution in Indonesia that internationally recognized &amp; comply with World GBC (by the end of 2009).</td>
<td>• The biggest collaborator hub, and acknowledged as the Knowledge Center for Green Environment &amp; Sustainable Development;</td>
<td>• Green Building and Environment (or Sustainable Development) Award</td>
</tr>
<tr>
<td></td>
<td>• Successfully in creating the awareness of the Sustainable Development: several buildings endorsed as the Green Building.</td>
<td></td>
</tr>
</tbody>
</table>
## Business Plan Development Stages of GBCI
### According to the World GBC’s Roadmap

<table>
<thead>
<tr>
<th>Vision</th>
<th>Mission</th>
<th>Values</th>
<th>Goals</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>The aspirations of GBC Indonesia in the future and what GBCI hopes to achieve</td>
<td>Brief statement of GBC Indonesia’s overall purpose in the present time</td>
<td>Beliefs that are shared among the stakeholders of GBC Indonesia and drive GBC Indonesia’s culture and priorities</td>
<td>Refer to a purpose or a target; or things that GBC Indonesia wishes to pursue or achieve</td>
<td>Planning or devising ways or means of reaching the goals and objectives set</td>
</tr>
</tbody>
</table>
Key Stakeholders of GBC Indonesia and Hypothetical Relationship Model

**Industries**
- FSI: Financial Services Industry
- ECU: Energy & Utilities
- RHC: Real Estate, Hospitality & Constructions

**Individual Professionals**
- Networking & collaborating
- Setting up environment-friendly standards
- Brand leveraging

**Associations**
- Networking & collaborating
- Knowledge exchange

**Civil Societies**
- Networking & collaboration
- Grass-root promoting
- Creating mass movements

**NGOs**

**Communities**

**Universities & Research Inst.**
- Networking & collaboration
- Expertise support
- Develop new environment-friendly standards

**Government**
- Local
- Central

- Partnerships
- Endorsing initiatives
- Legal adoption new standards
- Agreed new standards enforcement

- Networking & collaborating
- Setting up environment-friendly standards
- Brand leveraging
GBC Indonesia’s Strategic Themes

2009 – 2012
- Memberships
- Financials
- Networking & Collaboration Platform
- Guidelines & 1st Rating Systems
- Acknowledgement from WGBC
- Basic Infrastructure & facilities

2011 – 2015
- Campaign & socialization
- Membership expansion
- Operation improvement
- Credible rating system
- Sufficient Infrastructure & facilities

2014 – 2019
- Setting up National standards in Sustainable Development
- Creating ‘Best Practices’ and ‘Though Leadership’
- Campaign & socialization
- Networking & collaboration
- Membership expansion
- Operation improvement
- Advance infrastructure & campus

Strengthening the Foundations
- Building the Credibility and Creating the Awareness
- Expand and Transforming the Markets

Perceived and Real Value
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Building Functions & Markets Category – Certification Chains

Building Materials → Single Buildings → Neighborhoods → Cities

Bricks → Cements → Steels → Roofs → Sanitations → Etc.
<table>
<thead>
<tr>
<th>Country</th>
<th>Control and Regulatory Instruments</th>
<th>Economic and Market-Based Instruments</th>
</tr>
</thead>
</table>
| India   | • Energy Conservation Building Code (ECBC) will shortly become mandatory for commercial buildings with a connected load of 500kW or greater, and applicable to all buildings with a large air-conditioned floor area of 1000sqm or greater, and is recommended for all other buildings.  
• The National Building Code (2005) is voluntary. | • The Government of India is planning an expenditure of INR490m through the Ministry of New and Renewable Energy (MNRE) during 2008-12 for the promotion of energy efficient solar or green buildings in India.  
• Energy Service Companies (ESCO) market is developing with government support. See WRI 2009 report "Powering Up". |
| Indonesia | • Currently the national and municipal governments in Jakarta are updating the building code.  
• The Ministry of the Environment is currently drafting a regulation (Indonesian: Peraturan Menteri Lingkungan Hidup) that would require new buildings to meet and be certified against green criteria. | |
| Malaysia | • A Code of Practice on Energy Efficiency and Renewable Energy for non-residential buildings (MS 1525) issued by SIRIM Berhad, a government owned national organization for industrial standards, will provide minimum criteria for new and retrofitted buildings to be designed, constructed, operated and maintained in a manner that reduces energy use.  
• Contemplating stricter energy use standards to be released in the next year. | • The Malaysian government provides incentives for buildings to use photovoltaic (PV) technology. The government will pay fully for PV projects that cost less than six million Malaysian ringgit. The government will subsidize 50 percent of the cost of projects greater than six million).  
• In October 2009, the Malaysian government introduced substantial incentives to promote the use of the newly launched Green Building Index certification. |
| Philippines | • The Senate has been recently discussing the creation of government incentives for green buildings.  
• The Government Energy Management Program (GEMP) requires all government buildings to reduce by 10 percent or more the consumption cost of fuel, water, office supplies, electricity and other utilities by installing energy-efficient lights and fixtures.  
• Companies consuming more than two million fuel oil equivalent liters annually are also required to submit annual energy conservation reports detailing conservation efforts and results. | • The Department of Trade provides incentives for the use of new green building technologies. |
GBCI respect for the values of ecological balance, human rights, business ethics and more sustainable and equitable development are at the heart of strategies for progress on corporate responsibility throughout the world.

The Actions

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• Has the mainstream use and awareness of Green Practices in Indonesia
• Encourage the strong government and market support for Green Building Practices
• Has motives for being socially responsible
GBCI Indicator in Social

Convenience of building users

Accessibility in buildings

Ease of accessibility to the building site

Community participation in control

All matters relating to health, education and safety of occupants
GBCI Indicator in Economy

Effectiveness of a local nature in order to promote local revenue

Efficiency cost in buildings
Costs that come out since the building project will commence

Allocation of total funds used to build
GBCI Indicator in Environment

- water use
- energy use
- wastewater treatment
- material selection and component
- site situation
It’s not only a technology or engineering issue nor a trend, It’s a change of:

*Mindset - Behavior - A way of life – Culture*
the rating tools...”GREENSHIP”
Basic Principles of Green Building:
1. Site Management
2. Water Management
3. Energy & Atmosphere – ETH
4. Material Resources – SDA
5. Indoor Air Health & Comfort

LEED:
1. Sustainable Sites
2. Water Efficiency
3. Energy & Atmosphere
4. Material & Resources
5. Indoor Environmental Quality
6. Innovation & Design Process

GBC Indonesia:
1. Appropriate Site Development
2. Energy efficiency and refrigerant
3. Water Conservation
4. Material Resources and Cycle
5. Indoor Air Health and Comfort
6. Building Environment Management

Each country must have the local regional standard based on local condition.

No specific standardization for all the world then
**Complementary Differences**

<table>
<thead>
<tr>
<th><strong>Government</strong></th>
<th><strong>GREENSHIP</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mandatory</strong></td>
<td><strong>Voluntary</strong></td>
</tr>
<tr>
<td>- Lowest common level</td>
<td>- Higher standards</td>
</tr>
<tr>
<td>- No choice</td>
<td>- Have a choice</td>
</tr>
<tr>
<td>- Most industry should be able to implement</td>
<td>- Flexible implementation</td>
</tr>
<tr>
<td>- Encourage market going green</td>
<td>- Market responses more positive (\rightarrow) CSR</td>
</tr>
<tr>
<td>- Legitimation</td>
<td>- Consensus</td>
</tr>
<tr>
<td>- Ability to enforce</td>
<td>- Do not need any enforcement</td>
</tr>
<tr>
<td>- Ability to assess</td>
<td></td>
</tr>
</tbody>
</table>
## Comparison Rating Tools

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>LEED</th>
<th>LEED India</th>
<th>Green Mark</th>
<th>Green ship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate Site Development</td>
<td>16,5%</td>
<td>18,8%</td>
<td>20,0%</td>
<td>16,2%</td>
</tr>
<tr>
<td>Energy Efficiency and Conservation</td>
<td>27,1%</td>
<td>24,6%</td>
<td>35,0%</td>
<td>26,3%</td>
</tr>
<tr>
<td>Water Conservation</td>
<td>5,9%</td>
<td>8,7%</td>
<td>15,0%</td>
<td>21,2%</td>
</tr>
<tr>
<td>Material Resource and Cycle</td>
<td>18,8%</td>
<td>18,8%</td>
<td>0,0%</td>
<td>14,1%</td>
</tr>
<tr>
<td>Indoor Health and Comfort</td>
<td>25,9%</td>
<td>21,7%</td>
<td>15,0%</td>
<td>11,1%</td>
</tr>
<tr>
<td>Building Environment Management</td>
<td>0,0%</td>
<td>0,0%</td>
<td>0,0%</td>
<td>12,1%</td>
</tr>
<tr>
<td>Innovation</td>
<td>5,9%</td>
<td>7,2%</td>
<td>15,0%</td>
<td>0,0%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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</tbody>
</table>
# BENCHMARK

<table>
<thead>
<tr>
<th>Code</th>
<th>Rating</th>
<th>Max Point</th>
<th>Sub Total</th>
<th>Percentage</th>
<th>REFERENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APPROPRIATE SITE DEVELOPMENT</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Pre-Requisite</td>
<td>Basic Green Area</td>
<td></td>
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</tr>
<tr>
<td>ASD 1</td>
<td>Site Selection</td>
<td>2</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ASD 2</td>
<td>Community Accessibility</td>
<td>1</td>
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</tr>
<tr>
<td>ASD 3</td>
<td>Public Transportation</td>
<td>2</td>
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<tr>
<td>ASD 4</td>
<td>Bicycle</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASD 5</td>
<td>Site Landscaping</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASD 6</td>
<td>Micro Climate</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASD 7</td>
<td>Storm Water Management</td>
<td>3</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8</td>
<td></td>
<td>16,2%</td>
<td></td>
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</tbody>
</table>

**REFERENCES**

<table>
<thead>
<tr>
<th>Regulation</th>
<th>SNI</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
## APPROPRIATE SITE DEVELOPMENT

<table>
<thead>
<tr>
<th>PURPOSE</th>
<th>Maintaining or expanding the greening of town to enhance environmental quality, reducing direct runoff drainage system from overload pressure and minimize the impact on ground water systems for building use</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENCHMARK</td>
<td>The presence of vegetation landscape area (soft-scape) that is free from the building structure and building a simple structure of the garden (hard-scape) above ground or below ground with an area of minimum 10% of the total area of land or 50% from open spaces within the site.</td>
</tr>
<tr>
<td>BACKGROUND</td>
<td>Unplanned urban development causes land conversion toward uncontrollable construction. The results are poor air quality, the high concentration of pollutant and floods. Air quality due to CO2 as a result of human activity can not be absorbed by plant small amounts. Floods occur in the absence of water catchment areas due to closure of the ground by buildings and pavement. Therefore there needs to be immediate action to address this.</td>
</tr>
<tr>
<td>Code</td>
<td>Rating</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>EEC 1</td>
<td>Energy Efficiency Measure</td>
</tr>
<tr>
<td>EEC 2</td>
<td>Natural Lighting</td>
</tr>
<tr>
<td>EEC 3</td>
<td>Ventilation</td>
</tr>
<tr>
<td>EEC 4</td>
<td>Climate Change Impact</td>
</tr>
<tr>
<td>EEC 5</td>
<td>On Site Renewable Energy</td>
</tr>
</tbody>
</table>

**ENERGY EFFICIENCY AND CONSERVATION**

**Total:** 26

**Percentage:** 26.3%
ENERGY EFFICIENCY AND CONSERVATION

<table>
<thead>
<tr>
<th>PURPOSE</th>
<th>As a supporting facility procedures for monitoring and recording of electricity consumption, encouraging the consumption of energy savings through the application of energy efficiency measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENCHMARK</td>
<td>Installing sub-meters to measure electricity consumption, use of natural light optimally, encourage the use of efficient ventilation in public areas to make air infiltration from the outside, submit the calculation of CO2 emission reductions, and using new and renewable energy sources</td>
</tr>
<tr>
<td>BACKGROUND</td>
<td>One important aspect in making energy savings is the management which consist of measuring, recording and monitoring of energy consumption. Installation of Sub-Metering in certain places to support this management activity during the operation</td>
</tr>
<tr>
<td>Code</td>
<td>Rating</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>WATER CONSERVATION</strong></td>
</tr>
<tr>
<td>WAC 1</td>
<td>Water Use Reduction</td>
</tr>
<tr>
<td>WAC 2</td>
<td>Water Recycling</td>
</tr>
<tr>
<td>WAC 3</td>
<td>Rainwater Harvesting</td>
</tr>
<tr>
<td>WAC 4</td>
<td>Alternative Water Resource</td>
</tr>
<tr>
<td>WAC 5</td>
<td>Water Fixtures</td>
</tr>
<tr>
<td>WAC 6</td>
<td>Water Efficiency Landscaping</td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
## WATER CONSERVATION

<table>
<thead>
<tr>
<th><strong>PURPOSE</strong></th>
<th>Facilitate efforts to save water, the use of clean water sources and ground water taps by installing high efficiency water and replace it with the other source which still support the human life</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BENCHMARK</strong></td>
<td>Installation water meter equipment, installation of rainwater storage tanks, planning for the installation of water recycling with sufficient capacity for the entire system needs flushing, irrigation and cooling tower, using alternative water resources</td>
</tr>
<tr>
<td><strong>BACKGROUND</strong></td>
<td>The availability of clean water becomes an important issues in Indonesia, moreover, the geographical location of Indonesia caused high rainfall in most regions. One way of saving water is good water output device, which is capable of flowing water with a constant water discharge under conditions that are too high pressure</td>
</tr>
</tbody>
</table>
# MATERIAL RESOURCES AND CYCLE

<table>
<thead>
<tr>
<th>Code</th>
<th>Rating</th>
<th>Max Point</th>
<th>Sub Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRC 1</td>
<td>Building and Material Reuse</td>
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<tr>
<td>MRC 2</td>
<td>Environmentally Processed Product</td>
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<tr>
<td>MRC 3</td>
<td>Non ODS Usage</td>
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<tr>
<td>MRC 4</td>
<td>Certified Wood</td>
<td>2</td>
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<tr>
<td>MRC 5</td>
<td>Modular Design</td>
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<tr>
<td>MRC 6</td>
<td>Regional Material</td>
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<td>7</td>
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<td>14,1 %</td>
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</tbody>
</table>

**REFERENCES**

- Regulation: 4
- SNI: 0
### MATERIAL RESOURCES AND CYCLE

<table>
<thead>
<tr>
<th>PURPOSE</th>
<th>Preventing the use of materials that have ODP and ODS equal to or greater, using local material and use to reduce the use of new raw materials, reduce waste and to extend the lifetimes of a material substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENCHMARK</td>
<td>No use of CFC’s as refrigerants and Halon as a fire extinguisher, reuse the local material or from the other sources, using certified and renewable material which international and GBCI recognized, using modular or pre-fabricated material</td>
</tr>
<tr>
<td>BACKGROUND</td>
<td>From the environmental aspect, the use of buildings or the materials used means the role in reducing the burden from the city landfill construction waste due to demolition. From the economic aspect, to the owners of the building is certainly cost-saving construction. From the social aspect, stimulate the use of the former buildings of historical buildings are worth preserving for the identity of the city.</td>
</tr>
</tbody>
</table>
## Indoor Air Health and Comfort

<table>
<thead>
<tr>
<th>Code</th>
<th>Rating</th>
<th>Max Point</th>
<th>Sub Total</th>
<th>Percentage</th>
<th>Regulation</th>
<th>SNI</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHC 1</td>
<td>CO₂ Monitoring</td>
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<tr>
<td>IHC 2</td>
<td>Environmental Tobacco Smoke</td>
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<tr>
<td>IHC 3</td>
<td>Chemical Pollutan</td>
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<tr>
<td>IHC 4</td>
<td>Outside View</td>
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<tr>
<td>IHC 5</td>
<td>Visual Comfort</td>
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<tr>
<td>IHC 6</td>
<td>Thermal Comfort</td>
<td>2</td>
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<tr>
<td>IHC 7</td>
<td>Acoustic Level</td>
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<td><strong>Total</strong></td>
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<td><strong>11</strong></td>
<td><strong>11,1 %</strong></td>
<td></td>
<td><strong>6</strong></td>
<td><strong>5</strong></td>
</tr>
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</table>
INDOOR AIR HEALTH AND COMFORT

| PURPOSE | To maintain and improve indoor air quality by the introduction of outdoor air including monitor the concentration of CO2, reduce environmental pollution and cigarette smoke his presentation to the users of the building, reduce pollution of hazardous chemicals, eye fatigue, visual distractions and keeping the noise level inside the room at an optimal level. |
| BENCHMARK | Using no chemical pollutant paints, coatings and materials, the availability of the natural ventilation, natural lighting, thermal comfort, and optimal level of the acoustics level through design process |
| BACKGROUND | Source of indoor air pollution can come from outdoor air and from within the room. Quality Poor indoor air can decrease productivity and disrupt the comfort of building occupants. Ventilation to reduce indoor air pollution because the air flow into the room to perform dilution and cleaning up pollutants. Therefore we need a minimum level of optimum Heating, Ventilating, Lighting and Acoustic system in a building. |
## BUILDING ENVIRONMENTAL & MANAGEMENT

<table>
<thead>
<tr>
<th>Code</th>
<th>Rating</th>
<th>Max Point</th>
<th>Sub Total</th>
<th>Percentage</th>
<th>Regulation</th>
<th>SNI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEM 1</td>
<td>AP as a Member of The Project Team</td>
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<tr>
<td>BEM 2</td>
<td>Pollution of Construction Activity</td>
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<td>BEM 3</td>
<td>Advance Waste Management</td>
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<td>BEM 4</td>
<td>Proper Commissioning</td>
<td>2</td>
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<tr>
<td>BEM 5</td>
<td>Submission Implementation Green Building Data for Database</td>
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<td>BEM 6</td>
<td>Fit Out Guide</td>
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<td>BEM 7</td>
<td>Occupant Survey</td>
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<td><strong>12.1%</strong></td>
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<td><strong>5</strong></td>
<td><strong>3</strong></td>
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</tbody>
</table>

**BUILDING ENVIRONMENTAL & MANAGEMENT**
# BUILDING ENVIRONMENTAL & MANAGEMENT

| **PURPOSE** | Directs the steps of a Green Building design from an early stage to facilitate the achievement of a design that meets the rating including Commissioning Testing procedure, Advance Waste Management, Implementation Data Base, Fit Out Agreement with the tenant, and Occupant Survey |
| **BENCHMARK** | Involve an expert who has been certified as the AP, having a letter of agreement with the tenant or tenants of the building, Design and technical specifications should be complete and implement the installation of the entire construction, Measuring user experience through a survey of building materials to influence the design and operation of building systems |
| **BACKGROUND** | The building is a product that comes from assembling a variety of materials that do not necessarily match each other. This makes each building unique. Therefore, to ensure all systems are working well then there should be a continuous process to ensure all systems, especially on equipment (equipment) went as planned and sustainable. |
“Planning is bringing the future into the present so that we can do something about it now”
Site Area : 5.38 Ha

Total Area : 5,3846 Ha
Built Total Area : 19.827,70 M² (36.82 %)
Open Total Area (with hardspace) : 22.210,27 M² (41.25 %)
Green Total Area : 11.808,02 M² (21.93 %)

Total Area : 5,3846 Ha
Built Total Area : 18.243,64 M² (33.88 %)
Open Total Area (with hardspace) : 17.541,20 M² (32.58 %)
Green Total Area : 18.061,16 M² (33.54 %)
associated natural and recyclable materials, always green-building rating-minded, “Lifecycle”-minded in design, use more sustainable building advance methods and global material evaluation for every materials specified...
“We define our landscapes as much as they define us”
Green Building Council Indonesia

City Hall DKI JAKARTA

appreciation of the project which give attention to environmental conservation
Jakarta’s governor first initiated to renovate this building, and planned to improve the building’s performance renew it, and make it a pilot project for other government buildings that first applies Green Building system.
The world we have created today as a result of our thinking thus far, has problems which cannot be solved by thinking the way we thought when we created them.
Danida Office Renovation, Jakarta

Best interior design approach
Efficiency in energy consumption
Danida Office Renovation, Jakarta

Maximum street level noise reduction and air tightness
Visual comfort and better day lighting distribution by raising ceiling height
Clear accessibility and circulation
Danida Office Renovation, Jakarta

Sustainability
Maximum thermal and humidity comfort
Investor and Analysts should engage with building sellers and real estate developers, to assess a project’s exposure, vulnerability and capacity to mitigate energy insecurity, water scarcity and climate change risks.

Real Estate Developers should expand their green building capacity and start reporting energy, water and climate risks.

Government should establish an enforce stricter building codes that contemplate energy insecurity, water scarcity and climate change impact.

Green Building Council should expand building guidelines to include materials/design features that are resistant to climate change and any external impact.

Government, Real Estate Developers, Green Building Council, Universities, Engineers and Architects should work together to improve green building awareness, technical capacity, public data on resources and environmental risks, and investment in R&D for region-specific green building technologies.

For....
To tackle climate change we don’t have to reduce our quality of life, but we do have to change the way we live.
It is the FUTURE that we decide
Delaying action to address climate change will increase the environmental and societal consequences as well as the costs. The longer we wait to tackle climate change, the harder and more expensive the task will be (GBCI team)
‘The planet should not be used as a warehouse of resources to serve humanity's selfishness’ (GBCI team)