

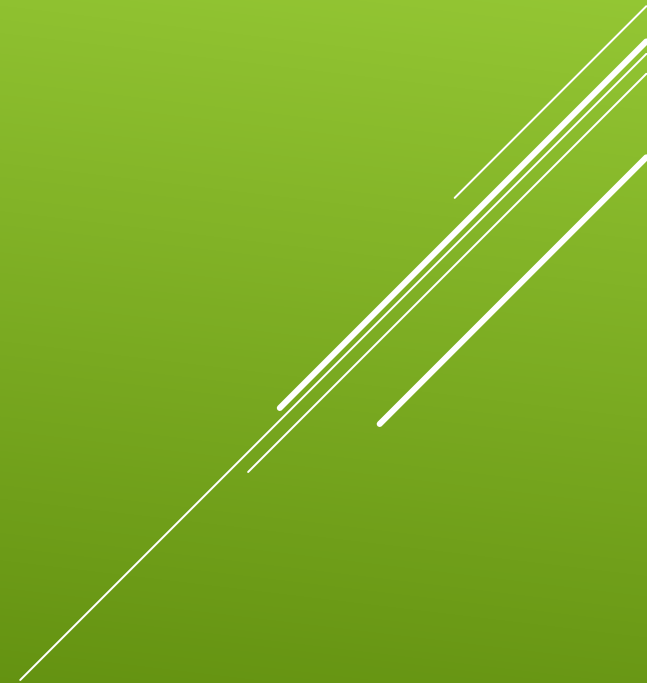
**CHALLENGES OF GREEN
BUILDINGS FROM M&E ENGINEER
PERSPECTIVE**

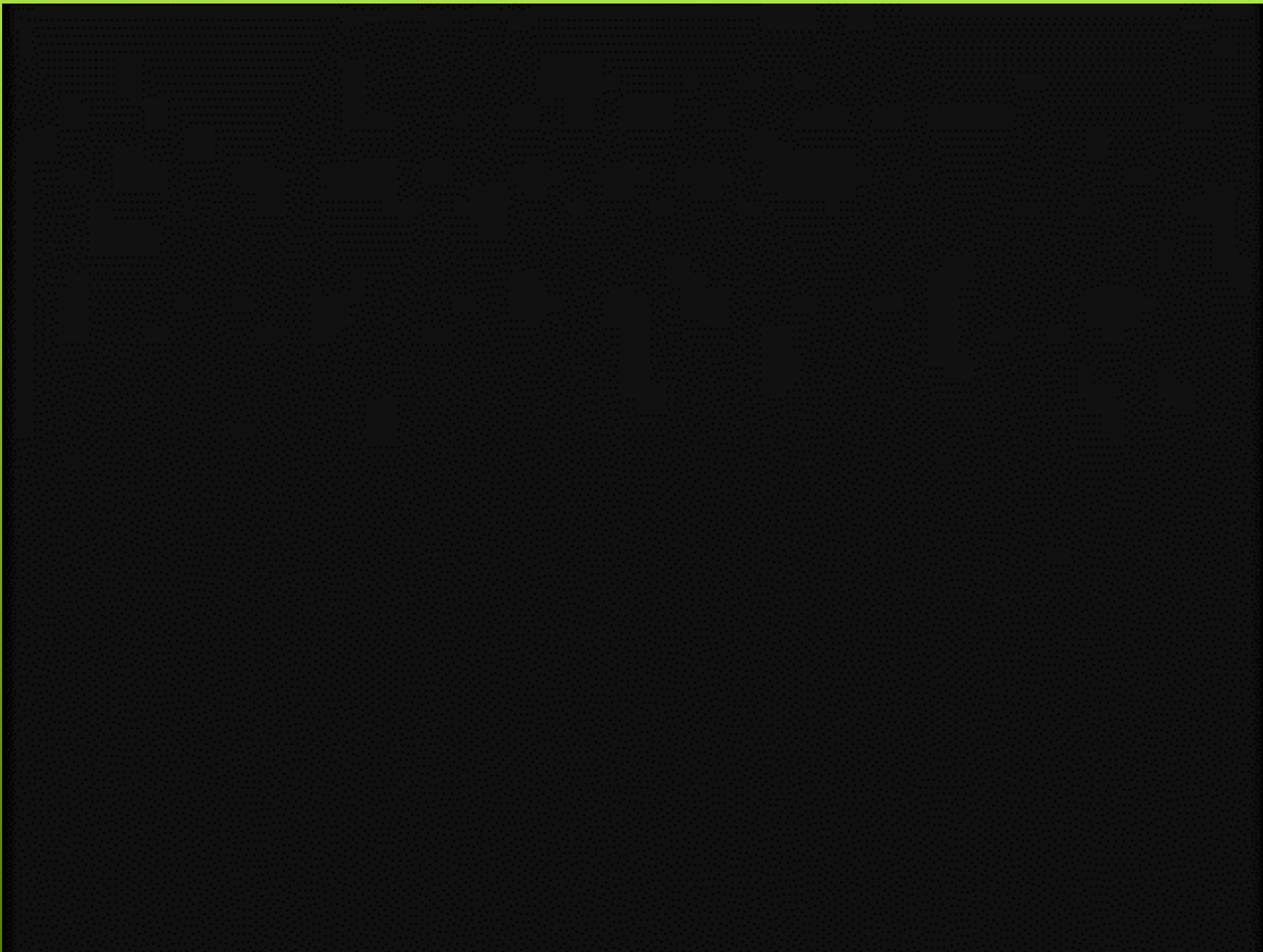
The background is a solid green color. On the right side, there are several white lines of varying lengths and thicknesses, all slanted diagonally from the bottom-left towards the top-right, creating a sense of motion or architectural lines.

OUTLINE OF THE PRESENTATION

1. Why Green?
2. What is Green?
3. What is Green Building from the perspective & personal experience as an M&E engineer ?
4. The Current Available Assessment Methods for Green Buildings.
5. The Assessment Criteria from Different Green Building Rating Tools.
6. The challenges that hindering developers or owners of the building to implementing sustainability environment from an M&E engineer perspective.
7. The Benefits of Going Green.
8. Q & A.
9. Thank you.

WHY GREEN ???



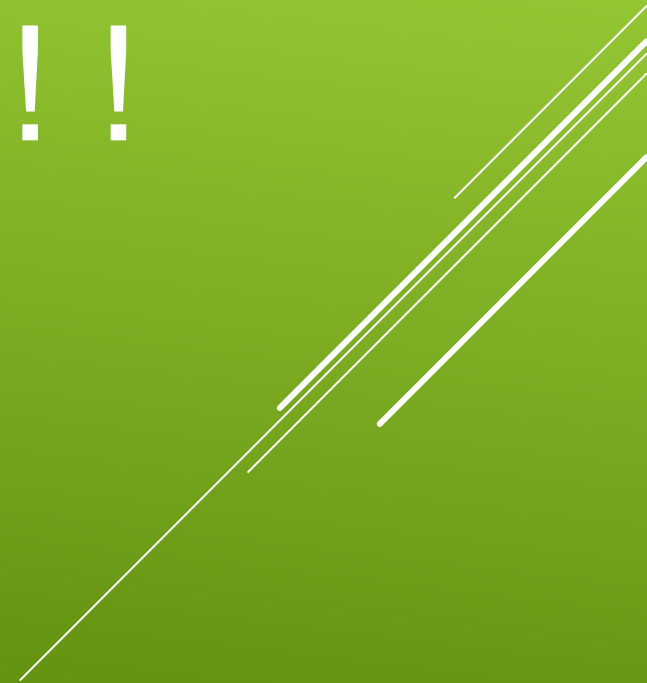


THE REASONS: -

- ▶ Ozone Layer Depletion!
- ▶ Global Warming!

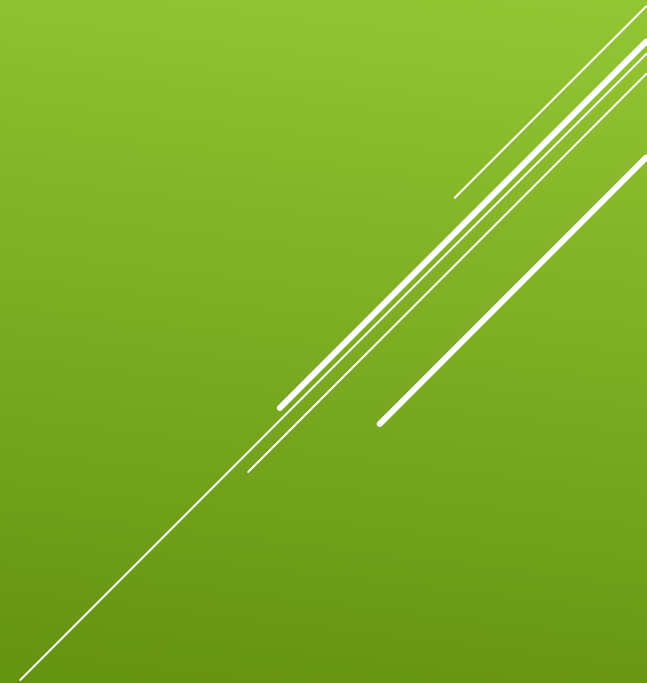


CLIMATE CHANGE !!!



WHAT ARE THE EFFECT OF CLIMATE CHANGE???

- ▶ Global Temperature Rise



What Impacts Can Be Expected?

FOR 1–4°C WARMING

RAIN

- 3–10% **less rainfall per degree** in Mediterranean, SW North America, southern Africa dry seasons
- 3–10% **more rainfall per degree** in Alaska and other high latitude NH areas
- 3–10% **more heavy rain per degree** in most land areas

RIVERS

- 5–10% **less streamflow per degree** in some river basins, including the Arkansas and Rio Grande

FOOD

- 5–15% **reduced yield of US corn, African corn, and Indian wheat per degree**

SEA ICE

- 15% and 25% **reductions in Arctic sea ice area per degree**, in the annual average and September (respectively)

FOR 1–2°C WARMING

FIRE

- 200–100% **increase in area burned per degree** in parts of western US

FOR 3°C

COASTS

- Loss of about 250,000 square km of **wetlands and drylands**
- Many millions more people at risk of **coastal flooding**

EXTREMES

- About 3 out of 10 summer seasons expected to be **warmer than all but 1 summer out of 20** in the last decades of the 20th century over nearly all land areas

FOR 4°C

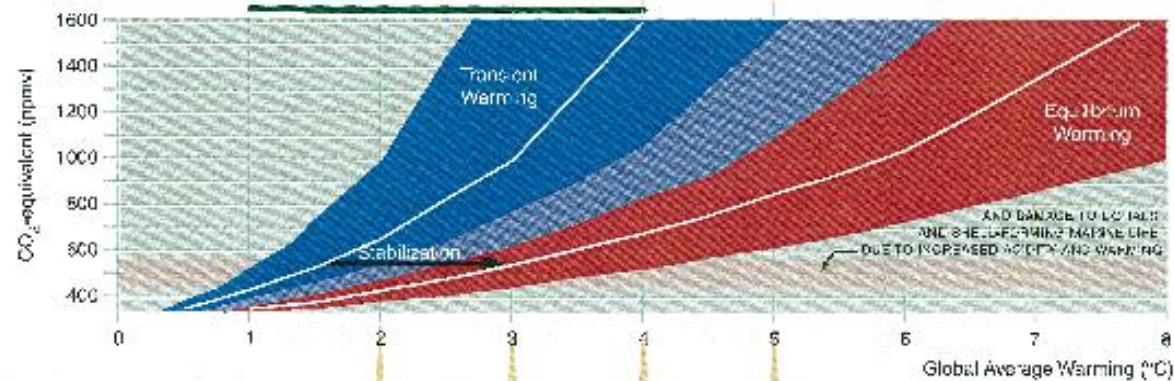
EXTREMES

- About 3 out of 10 summers warmer than the **warmest ever experienced** during the last decades of the 20th century over nearly all land areas

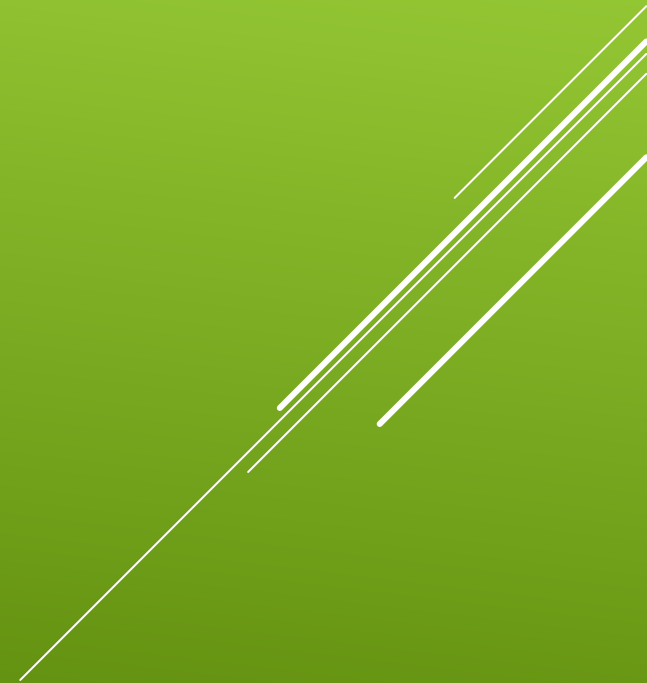
FOR 5°C

FOOD

- Yield losses in most regions and **potential doubling of global grain prices**



WHAT IS GREEN???



- ▶ Green is the symbolic colour of environmentalism and sustainability.
- ▶ In many cultures, green is the colour associated with nature and growth.
- ▶ Green is often used to describe efforts to reduce the impact of modern human life on the rest of the natural world.
- ▶ There is no single way to define “being green,” nor is there a limit to the number of efforts that can be made to go green.
- ▶ Green has no finite end—humans will always have to tackle new challenges to living in harmony with the environment. But consider your day-to-day actions individually, and look for easy ways to improve.

DEFINITION OF GREEN BUILDING (GBCA)

- ▶ A green building incorporates design, construction and operational practices that significantly reduce or eliminate its negative impact on the environment and its occupants.
- ▶ Building green is an opportunity to use resources efficiently while creating healthier environments for people to live and work in. Green building can also significantly reduce construction and performance costs.


A Green Building is designed:

- ▶ To save energy and resources.
- ▶ To recycle materials and minimise the emission of toxic substances throughout its life cycle.
- ▶ To harmonise with the local climate, traditions, culture and surrounding environment.
- ▶ To be able to sustain and improve the quality of human life while maintaining the ecosystem at local and global levels.

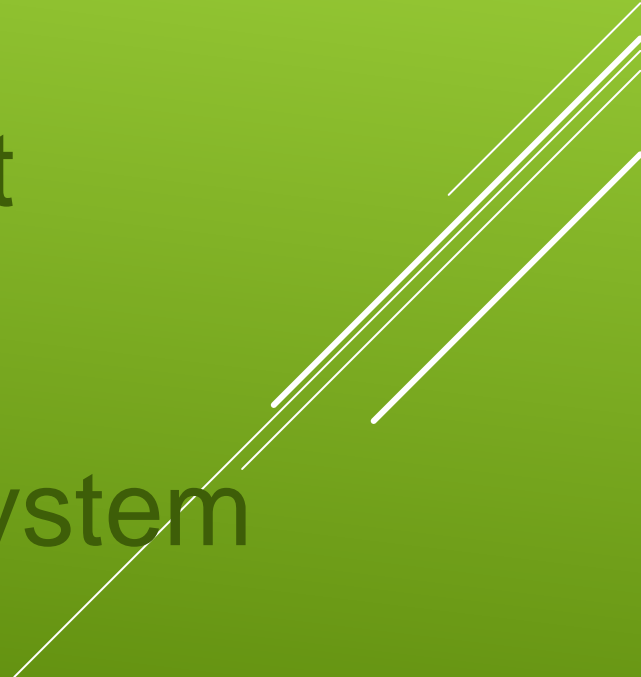
THE REQUIREMENT ON GREEN BUILDING FROM THE PERSPECTIVE OF M&E ENGINEER

- ▶ Energy Efficiency
 - ▶ Water Efficiency
 - ▶ Indoor Air Quality
 - ▶ Proper Maintenance of the Building Equipment
- 

ENERGY EFFICIENCY

- ▶ Efficiency of the equipment
 - ▶ Selection of the equipment
 - ▶ Optimum design of the M&E System
- 

WATER EFFICIENCY

- ▶ Efficiency of the water fittings
 - ▶ Selection of the fixtures / equipment
 - ▶ Optimum design of the Plumbing System
- 

INDOOR AIR QUALITY

- ▶ Green, i.e., Fresh Air
- ▶ Minimum shall comply with UBBL requirement
- ▶ Reduce the Indoor CO₂ level (PPM)

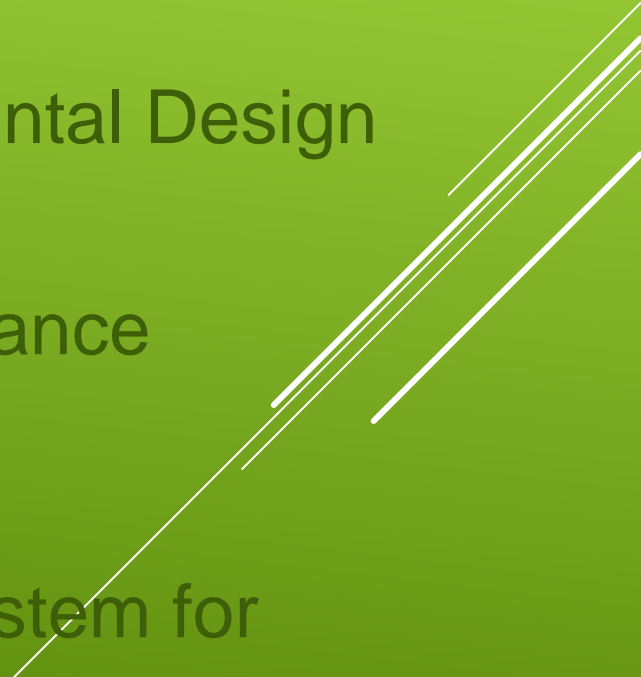
MAINTENANCE

- ▶ Maintain the performance of the equipment
 - ▶ Monitor the performance of the M&E System
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom right towards the top right, located in the lower right quadrant of the slide.

MAINTENANCE

- ▶ Maintain the performance of the equipment
 - ▶ Monitor the performance of the M&E System
- 
- A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

THE CURRENT ASSESSMENT METHODS FOR GREEN BUILDINGS

- ▶ BREEAM, UK – Building Research Establishment Environmental Assessment Method
 - ▶ LEED, USA – Leadership in Energy and Environmental Design
 - ▶ BEPAC, Canada – Building Environmental Performance Assessment Criteria
 - ▶ CASBEE, Japan – Comprehensive Assessment System for Building Environmental Efficiency
- 

THE CURRENT ASSESSMENT METHODS FOR GREEN BUILDINGS

- ▶ LCA / LCC Tool, Hong Kong – Life Cycle Assessment / Life Cycle Cost
 - ▶ EEWH, Taiwan – Green Building Evaluation System
 - ▶ Green Star, Australia / New Zealand
 - ▶ Green Mark, Singapore
- 

THE CURRENT ASSESSMENT METHODS FOR GREEN BUILDINGS

- ▶ GBTool, (20 Countries) – Green Building Tool
 - ▶ GBI, Malaysia – Green Building Index
- 

THE ASSESSMENT CRITERIA FROM DIFFERENT GREEN BUILDING RATING TOOLS

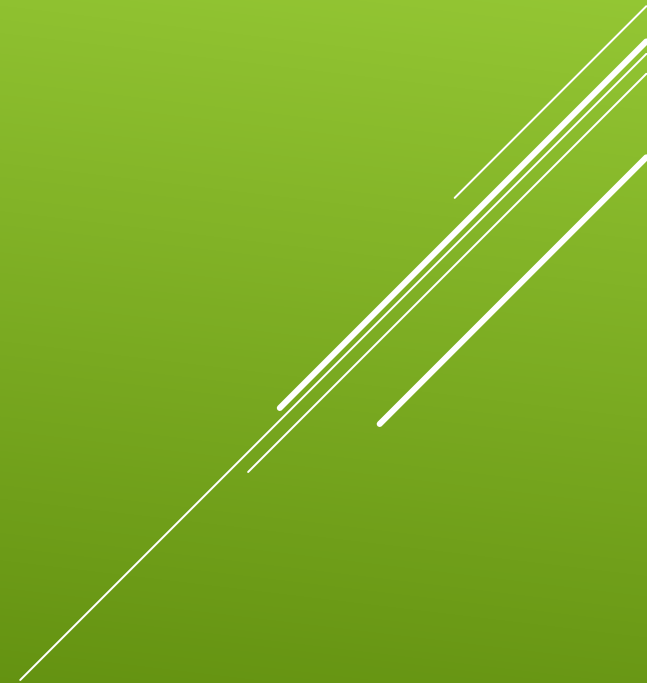
Name Year	BREEAM UK 1990	LEED USA 1996	GREEN STAR Australia 2003	GREEN MARK Singapore 2005	GBI Malaysia 2009
Assessment Criteria	1. Management	1. Sustainable Site	1. Management	1. Energy Efficiency	1. Energy Efficiency
	2. Health & Comfort	2. Water Efficiency	2. Transport	2. Water Efficiency	2. Indoor Environmental Quality
	3. Energy	3. Energy & Atmosphere	3. Ecology	3. Environmental Protection	3. Sustainable Site Planning & Management
	4. Transportation	4. Materials & Resources	4. Emissions	4. Indoor Environmental Quality	4. Material & Resources
	5. Water Consumption	5. Indoor Environmental Quality	5. Water	5. Other Green Features	5. Water Efficiency
	6. Materials	6. Innovation & Design / Construction Process	6. Energy		6. Innovation
	7. Land Use		7. Materials		
	8. Ecology		8. Indoor Environmental Quality		
	9. Pollution		9. Innovation		

THE CHALLENGES THAT HINDERING
DEVELOPERS / OWNERS OF THE BUILDING TO
IMPLEMENTING SUSTAINABILITY ENVIRONMENT
FROM THE PERSPECTIVE OF M&E ENGINEER



- ▶ Economic and financial barrier
 - ▶ Awareness and understanding barrier
 - ▶ Expertise and technology barrier
 - ▶ Lack of training and education
 - ▶ Lack of commitment from organization, i.e., social commitment
 - ▶ No requirement and demand from stakeholders
 - ▶ Lack of enforcement, i.e., Government Policy
- 

THE BENEFITS OF GOING GREEN



FROM ENVIRONMENTALIST PERSPECTIVE

- ▶ reducing pollution ,
- ▶ conserving natural resources,
- ▶ recycling non-biodegradable products,
- ▶ contributing to conservation of forests and wildlife,
- ▶ cultivating more plants and trees in vacant lands, and
- ▶ helping to maintain the ecological balance on the earth, so that all living beings can survive and thrive in their natural habitat.

FROM M & E ENGINEER PERSPECTIVE

- ▶ Save Energy
- ▶ Save Resources
- ▶ Save Money
- ▶ Save the Ecosystem
- ▶ Save Your Health
- ▶ Save the Future
- ▶ Save the Planet



Q & A



THANK YOU

