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AGRICULTURE • INNOVATION • LIFE

FAKTOR-FAKTOR YANG MEMBERI KESAN KEPADA PENGURUSAN KELESTARIAN BANGUNAN WARISAN: REKA BENTUK PENCAHAYAAN OPTIMA

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SEMINAR 'MUZIUM UNTUK MASYARAKAT LESTARI'

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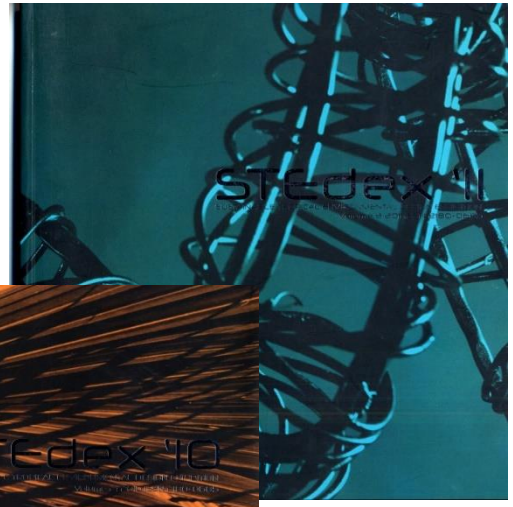

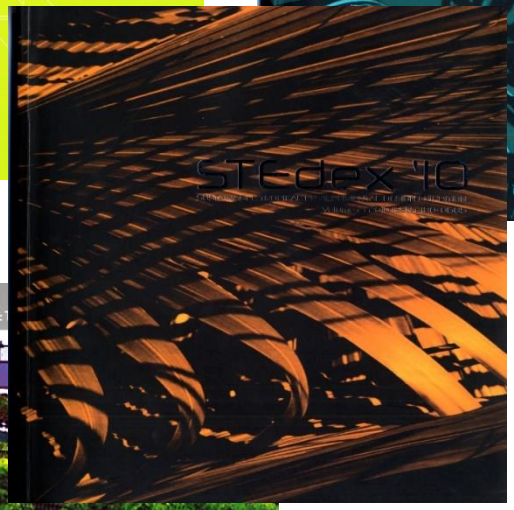

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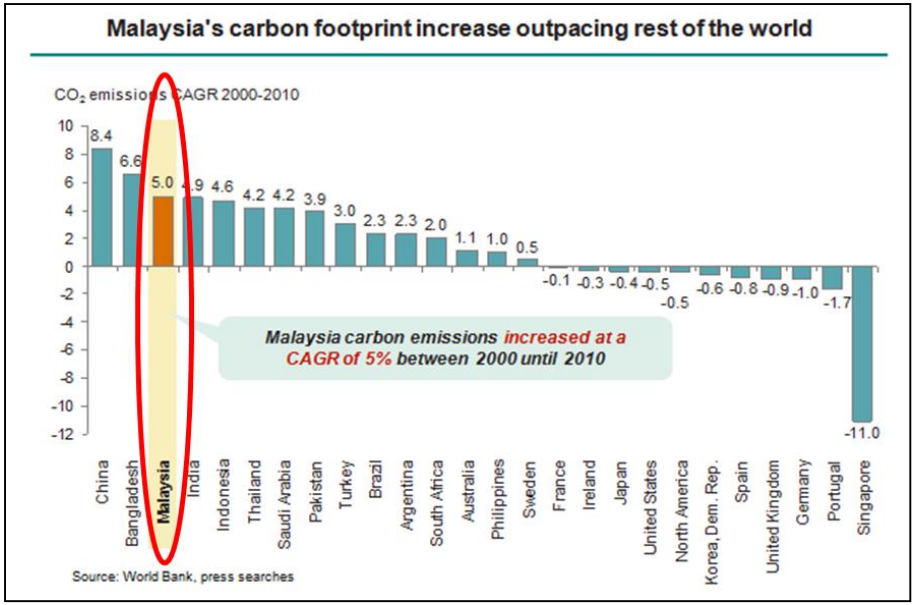
1. Introduction

Sustainable development is defined by the Brundtland Report as “the type of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

- United Nations, 1983

World Population by 2050 is **9.7b** (UN, 2015)



1. Introduction

ICOM members to “do everything we can to ensure that museums are part of the **cultural driving force** for the sustainable development of the world.”

Prof. Dr. Hans-Martin Hinz,
President of ICOM (2015),

Sustainable Indicators

1. SOCIAL
2. ECONOMIC
3. ENVIRONMENTAL

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1. Introduction

Contemporary vs Heritage

Guggenheim Museum, Bilbao

Pyramid of Giza, Egypt

1. Introduction

Contemporary vs Heritage

Guggenheim Museum, New York

Jiangzhao Museum

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2. Property Development Lifecycle

Pre-construction

1. Schematic Design Phase
2. Design Development Phase
3. Contract Documentation Phase

Construction

1. Contract Implementation Phase

Post-construction

1. Management Phase

- Board of Architects Malaysia, 2010

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- Introduction to Sustainable Development
- Property Development Lifecycle Process
- Current National Policies
- Green Building Ratings
- Optimizing Lighting
- Conclusions & Recommendations

3. Current National Policies

National Policies on Climate Change (2009) through the Strategic Thrust for RE and EE that champions the energy efficiency through promotion of green buildings in commercial/institutional, industrial and residential sectors.

The purpose is **to achieve energy efficiency** through application of low or zero energy concept in the design and construction of new buildings; retrofitting of efficient ventilation and cooling systems as well as lighting systems; energy conservation practice in buildings; retrofitting existing buildings to include EE features and generate RE; and development of a green building index.

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

YEAR	POLICIES/PROGRAMMES	AGENCY
FUTURE	• Green PASS (Green Performance Assessment System In Construction) • In consultation phase with stakeholders • Developed by Construction Industry Development Board of Malaysia (CIDB) • Covers construction phase and operational phase of the building. – Construction phase 5 elements- assessment of the construction site, building materials, energy, water and waste. – Operational phase 3 elements – Building indoor environmental quality (IEQ), energy and water	CIDB
2012	• PWD Green Rating Scheme (JKR Malaysia) • Rating tool for government buildings • 5 criteria - Energy efficiency, Indoor environmental quality, Sustainable site planning & management, Materials & resources, Water efficiency	PWD
2011	• Low Carbon Cities Framework & Assessment System	MESTW

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

2011	• Low Carbon Cities Framework & Assessment System
	  • Covers four aspect of township – Environment, Infrastucture, Transportation & Building
	  • Low Carbon Building: 5 criteria – Energy (EE+RE), indoor environment quality, site construction management, materials, water management
	  • PILOT projects – Miri City Council, University of Malaya, Pulau Sahbesar in Kenyir, Port Dickson Municipal Council and Hang Tuah Jaya in Melaka
	• Green Township – Putrajaya & Cyberjaya
	• Green Neighbourhood Guidelines
	  • Promoted by Ministry of Housing and Local Government (MHLG)
	  • for local council enforcement use in evaluating plan submission
		MEGTW
		
		MEGTW
		MHLG

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

	• in line with LCCF with 4 criteria - Smart Location, Neighbourhood Pattern & Design, Green Infrastructure, Green Communities Network • Building Sector Energy Efficiency Project (BSEEP) • 5-year project - collaboration between United Nations Development Program (UNDP), Global Environmental Facility (GEF) and the government (Public Work Department (PWD) as the implementor)	PWD
2010	• National Energy Efficiency Master Plan Study 2010 • Replacing Incandescent to Compact Florescent Lamp (CFL) • Replacing Inefficient Refrigerators with 5-star Refrigerators, • Raising Air Conditioner Temperature to 25°C, • Replacing T8 to T5 lamp for Government Offices • Energy Auditing for Commercial Buildings • Economic Transformation Programme • Energy Performance Management System (EPMS) for government entities	MEGTW

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

2009	• National Green Technology Policy • National Energy Centre (PTM) restructuring to Malaysian Green Technology Corporation (MGTC), • Green Technology Financing Scheme(GTFS) (2010 -2015) – Approved GT Value for Financing (RM): 1,118,895,495.00 – Balance of GT Value for Financing (RM): 2,381,104,505.00 • Green Township in Putrajaya and Cyberjaya, • International Greentech and Eco Products Exhibition and conference Malaysia (IGEM). • National Policy on Climate Change	MEGTW MNRE

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

	• Green Building Index (GBI)
	  • Developed by Malaysian Institute of Architects (PAM) and the Association of Consulting Engineers Malaysia (ACEM) supported by Malaysia Green Building Confederation (MGBC). Separates between Residential & Non-residential – the non-residential rating tools are customised by nature of whether they are commercial, industrial or institutional - including the Industrial Rating Tool
	  • 6 criteria measuring energy efficiency (EE) – indoor environment quality, sustainable site and management, materials and resources, water efficiency, and innovation
		private initiative

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

2001 - 2008	• The Efficient Management of Electrical Energy Regulation 2008 • Uniform Building By-Laws (UBBL) (1984), amended 2007 • Code of Practice on EE and Use of RE for Non-residential Buildings – MS 1525: 2001, revised 2007 – by SIRIM • Guidelines for Conducting Energy Audits in Commercial Buildings (2004) • Design Strategies for Energy Efficiency in New Buildings (Non-Domestic) (2004)	

3. Current National Policies

Table 1: Various Building Related Policies and Initiatives Championed by the Government Together with Various Stakeholders (Source: Shuhaida, et al., 2013)

2000s - 1970s	• National Policy on the Environment (2002) • The Electricity Supply Act 1990 and the Electricity Supply Act (Amended) 2001 • Four Fuel Diversification Policy (1981) • National Depletion Policy (1980) • National Energy Policy (1979)	

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4. Green Building Ratings

Table 2: Selected Building Assessment Tools Across Sustainability Indicators and Stage of Building Life (Adapted from Mohd Annuar, et al., 2014)

Assessement Tool	Year	Sustainability Indicator			Building Life			
		Env.	Social	Econ.	Design	Construction	Operation	Decommission
GBI (PAM)	2009	X			X	X	X	
GreenPASS (CIDB)	2012	X				X	X	
PWD Green Rating	2012	X				X	X	
GreenRE (REHDA)	2013	X				X	X	

No socio-economic values?

Which tool?

Heritage Buildings?

4. Green Building Ratings- Environmental Measures

PART 1: Energy Efficiency (EE)
PART 2: Indoor Environmental Quality (EQ)
PART 3: Sustainable Site Planning & Management (SM)
PART 4: Materials & Resources (MR)
PART 5: Water Efficiency (WE)
PART 6: Innovation (IN)

GBI

- Architectural Building Materials
- Energy Efficiency
- Lighting, Visual & Acoustic Comfort
- Indoor Environmental Quality
- Renewable Energy
- Recycled Content Materials
- Site & Environmental Protection
- Water Efficiency
- Waste Management
- Green Building Consultants & Service Providers

MGBC

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4. Optimizing Lighting

Case Study Research:
Lighting Optimization for Heritage Building (Sahraei, 2014)

Royal Abu Bakar Museum

National Textile Museum

Case 1: National Textile Museum

Source: www.muziumtekstilnegara.gov.my

Case 2: Muzium Di Raja Abu Bakar

4. Optimizing Lighting

- Possibilities of accepting new and modern tools and devices to reduce electricity

1. Conserving electricity could be done by **employing new tools, devices, and technologies** are possible and can be done easily by accepting suitable methods and approaches.

2. **Hiding the tools or matching their characteristics** with historic buildings' components, structure, and material in terms of the colour and design form.

4. Optimizing Lighting

- How tools and facilities contributes to electricity consumption reduction

1) Employing and installing energy efficient tools and devices including electricity saving lights like LEDs, lighting controller tools like timers and sensors, and tools that **work automatically and gives automatic characteristics to the lighting system**.
2) Installation of lighting tools and devices **to control any possible damages on the valuable and historic characteristics** of these buildings.
3) **Hiding the tools or matching their characteristics** with historic buildings' components, structure, and material in terms of the colour and design form.

4. Optimizing Lighting
-How BIM can be integrated to reduce electricity

1. The historic buildings' features and specifications are conserved **thru installation of a successful lighting system** which can control possible damages for their valuable characteristics.

2. Among the required features:

- need to be **intelligent** and **simple**,
- **provides feedback**,
- **considers daylight** as an available source of energy for providing illumination,
- **considers different level of heat and humidity** inside the historic buildings
- -considers the **level of needed illumination** for reducing and controlling electricity waste.

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5. Conclusions & Recommendations

- Existing **green rating indexes** that are currently benchmarking sustainable buildings in Malaysia not quite comprehensive to museums.
- **Heavy emphasis on the environmental indicator** in the local Green Rating Tools.
- Obvious **gaps in the social and economic indicators**.

Premature to recommend a quick referral to any one green building index for specific museum typology.

5. Conclusions & Recommendations

RECOMMENDATION 1

Develop own comprehensive Green Rating tool called **Green Museum Index** for museums.

Heavier measures on museums social and economic contribution's indicators thus making museums as a **potential comprehensive sustainable entity** by its own uniqueness.

5. Conclusions & Recommendations

RECOMMENDATION 2

Possible sustainability management start with the **lighting considerations** for heritage buildings.

They include potential technologies and emphasis on the **interior part of the heritage building** for enabling knowledge transfer in a building life cycle.

5. Conclusions & Recommendations

New role for the Department of Museums Malaysia in enhancing **sustainable development** for Malaysia.

Fostering closer collaboration between institutional and research institutional ICOM members in Malaysia.

Department of Museums Malaysia has potential to play a significant role in **developing a new Green Museum Index** for all members of ICOM.

Acknowledgements

Lighting designers of National Textile Museum

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Director of Royal Abu Bakar Museum

Lighting designer of Royal Abu Bakar Museum

Lighting technician of Royal Abu Bakar Museum

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Terima Kasih | *Thank You*

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