Green Economy Guideline Manual

2014

EY
Building a better working world

Tourism

ISKANDAR REGIONAL DEVELOPMENT AUTHORITY

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Foreword

Malaysia's commitment to sustainable development is articulated through its national development plans including the "Tenth Malaysia Plan, The New Economic Model" which underlines the long term development framework for Malaysia. At the Earth Summit in 1992, Malaysia pledged to keep at least 50% of its land area as forest cover, and has maintained its commitment with forest cover in 2012 being at 56.4% of total land area.

Leaders of governments at the United Nations Conference on Sustainable Development (Rio+20, Rio di Janeiro, 2012) resolved to act on addressing challenges in achieving sustainable development through the development of 'Green Economy' in their countries. The Government of Malaysia at Rio+20 re affirmed its commitment to sustainable development, and its voluntary reduction commitment (announced at the15th meeting of Conference of Parties, Copenhagen, 2009) of greenhouse gas emissions intensity of GDP by up to 40% by 2020, compared to 2005 levels. Our Prime Minister has also launched our Low Carbon Society Blueprint (at the 18th meeting of Conference of Parties, Doha, 2012) as our commitment to building a green economy at Iskandar Malaysia.

Climate change is no longer a myth but a reality that affects all of us. The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) has stated that an increase of 0.85°C in the global average surface temperature could wreak havoc upon our environment. Earlier in 2014, Malaysia experienced one of its worst dry spells, triggering the Malaysian cabinet to consider calling a state of emergency in 15 areas in Malaysia that had not experienced rainfall in more than 20 days.

We have developed this Green Economy guidelines (GEG) manual which provides a checklist for businesses to address areas of procurement, operations and supply chain management in order to minimize impact on the environment. The development of these guidelines included consultations with ministries and government agencies, business associations, local bodies, international agencies and IRDAs own business teams.

The goal of the GEG manual is to help businesses and industries to study, evaluate, adopt and inculcate environmentally sustainable economic behavior leading to building a prosperous, resilient, robust and globally competitive green economy in Iskandar. This is in line with IRDA's vision of becoming a

"Strong and Sustainable Metropolis of International Standing". The LCS Blueprint has 3 main themes – Green Economy, Green Community and Green Environment. This manual is an output of the first theme and focuses on the **tourism industry**.

We hope businesses in Iskandar in the tourism industry will find these guidelines relevant and useful in evaluating and adopting more innovative and sustainable practices, contributing to Green Economy in Iskandar.

In closing, I would like to thank and congratulate all parties involved in the production of this manual. I would also like to make a special mention of the advice and support given by the Working Group to the IRDA team and consultant Ernst & Young's Climate Change and Sustainability Services team in putting together this manual.

Y. Bhg. Datuk Ismail Ibrahim

Chief Executive IRDA

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Glossary

AV	Audio-visual
BAU	Business-as-usual
BEMS	Building Energy Management Systems
CAGR	Compound Annual Growth Rate
CFL	Compact Fluorescent Lighting
ESG	Environmental, social and governance
EV	Electric vehicles
FWD	Food waste disposers
GBI	Green Building Index
GDP	Gross Domestic Product
GGP	Government Green Procurement
GHG	Greenhouse gases
GPS	Global Positioning Systems
HRV	Heat Recovery Ventilation
HVAC	Heating, ventilation and air conditioning
ICT	Information and Communications Technology
IHG	Intercontinental Hotels Group
IM	Iskandar Malaysia
IRDA	Iskandar Regional Development Authority
KeTTHA	Malaysia Ministry of Energy, Green Technology and Water
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
LEP	Light-emitting plasma
MICE	Meetings, Incentives, Conferences and Exhibitions
NEP	National Ecotourism Plan
PPP	Public-Private Partnerships
UNEP	United Nations Environment Programme

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNWTO	United Nations World Tourism Organization

Tourism Industry

1. Industry Overview

United Nations World Tourism Organization (UNWTO) defines tourism as "the activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited." Therefore, unlike other industries, the tourism industry consists of diverse sectors across the products and services lines including transportation, accommodation, food and beverage, and recreation and entertainment.

Tourism is an important industry sector in the global economy. Tourism contributes to the economy not only through export revenue, but also through job creation and by stimulating growth of local businesses and infrastructure. The number of global travel arrivals reached 1.1 billion in 2014, showing an average growth of 4.7%. Its impact (direct, indirect and induced impacts) is estimated to be around 9% of the total global Gross Domestic Product (GDP) (UNWTO, 2013). This figure is larger than the contribution of major manufacturing sectors, such as automotive and chemicals.

In Malaysia, tourism plays a major role as the second largest foreign exchange earner. More specifically, the tourism industry is expected to grow in terms of GDP contribution from 8% in 2005 to 12% by 2025 (Iskandar Malaysia Development Authority, 2011). As evident from Malaysia Budget 2015, the government is committed to growing this industry. The tourism industry is poised to receive support from the government, including RM316 million for various programs by the Ministry of Tourism and Culture (Budget 2015: Full text of Najib's speech, 2015).

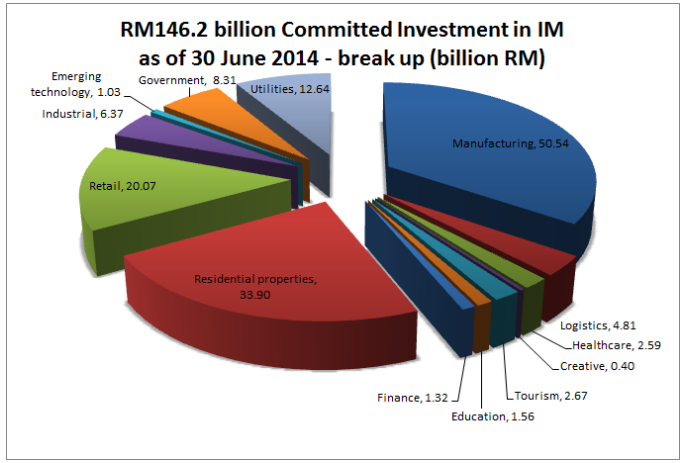

Figure 1: Cumulative investment in IM (Low & Kasmuri, 2014)

1.1. Environmental Impacts

In 2008, the UNWTO conducted a joint-study with the United Nations Environment Programme (UNEP) to measure the environmental impact of the tourism industry. By analysing three major sectors, which are (1) transport, (2) accommodation, and (3) activities, the UNWTO estimated that global tourism accounts for approximately 5% of global emissions.

On an international level, the industry is expected to grow at a faster rate than the total economy at a Compound Annual Growth Rate (CAGR) of 4.2% for the period 2013-2023 (World Travel & Tourism Council, 2013). Furthermore, tourism-related emissions are expected to grow around 161% between 2005 and 2035 based on a 'business-as-usual' (BAU) scenario below (UNEP & UNWTO, 2008).

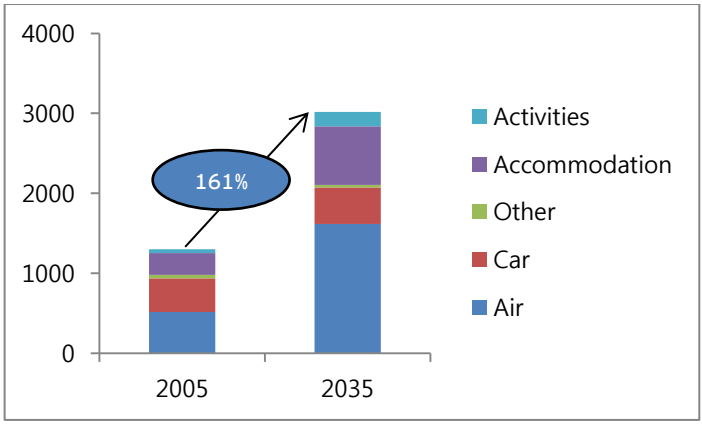

Figure 2: BAU scenario of CO_2 emissions of tourism sector (in $MtCO_2e$)

The industry has large potential to reduce emissions. According to an analysis by UNWTO, emissions from the global tourism industry can be reduced by 38% with technical efficiency achieved in all transport, accommodation and activities sectors. The reduction could even reach 44% if changes are made in transportation modes, destination distances and length of stay. Under this scenario, if all of the efforts fore-mentioned are maximized, the industry emissions can be reduced by 68% compared to the BAU emissions. This figure is lower than the 2005 emissions by 16% (UNEP & UNWTO, 2008).

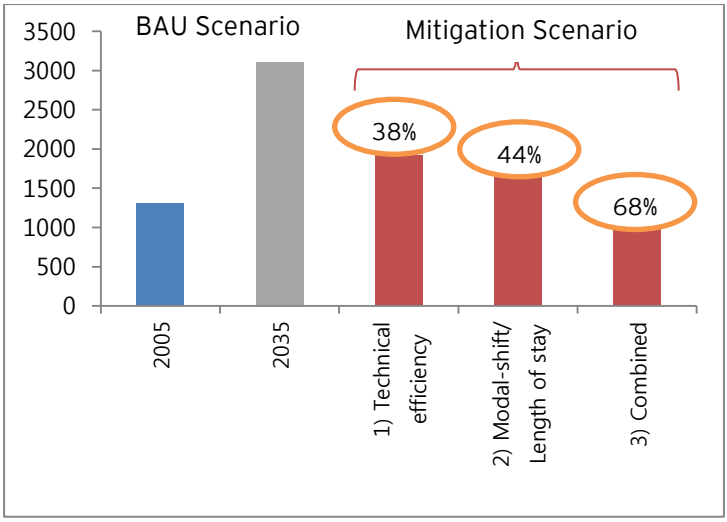

Figure 3: CO_2 mitigation potential from global tourism scenario (in $MtCO_2e$)

The tourism industry is very closely related to climate change. Many tourist attractions rely on the natural beauty of the region and seasonal activities. Malaysia is blessed with an incredible variety of marine life and clear warm waters around its many dive sites, as well as beautiful highlands and well-preserved rainforests. With 25.7 million tourist arrivals in 2013, Malaysia is ranked as the 9th most visited place in the world (Malaysia Tourism). As Malaysia heralds *Malaysia Year of Festivals 2015*, the demand for leisure and travel is expected to grow at a faster rate, so do the environmental impacts. Therefore, it is necessary for the industry to take actions to mitigate environmental

impacts and operate in a greener way.

This guideline will first analyse the tourism industry and its environmental impacts. Based on the analysis, it will then identify green growth opportunities and provide recommendations for improvement.

2. Identifying Green Opportunities

Tourism industry consists of all the products and services that a traveller needs during his/her travel experience. The industry can be classified largely into (1) transport, (2) accommodation, and (3) activities. Transport is defined as any modes of transportation that a traveller needs to get to places. This includes air, land and water transportation modes. Accommodation is defined as any facilities that travellers use to seek shelter, such as hotels, inns and motels. Activities refers to food and beverage serving activities, travel agencies activities, cultural, sports and recreation activities and retail trade of country-specific tourism characteristic goods (UNWTO).

2.1 Areas for Intervention

2.1.1 Transport

Emissions from global tourism in 2008 are 1,302 $MtCO_2e$, which is about 5% of total global emissions. Figure 4 shows that 75% of the emissions from global tourism come from the transport sector. Among the transport sector, most of the emissions are from air transportation mode. Car transportation is the next sector to cause large amount of emissions (UNEP & UNWTO, 2008).

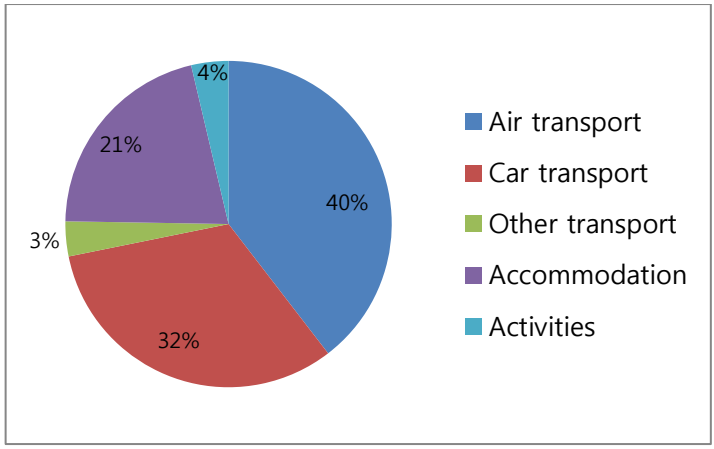

Figure 4: Emissions from global tourism (in $MtCO_2e$), 2008

2.1.1.1 Air Transport

Air transport is the largest contributor of greenhouse gases (GHG) emissions (40%) in the tourism industry despite the number of travels via air being the smallest (Figure 5). In addition, UNWTO reports that 40% of 840 million international travels by air in 2006, with the majority on long distance flights (UNEP & UNWTO, 2008). Considering the bulk of emissions from the air transport sector come from international air travel, it is important to green the operations in this sector.

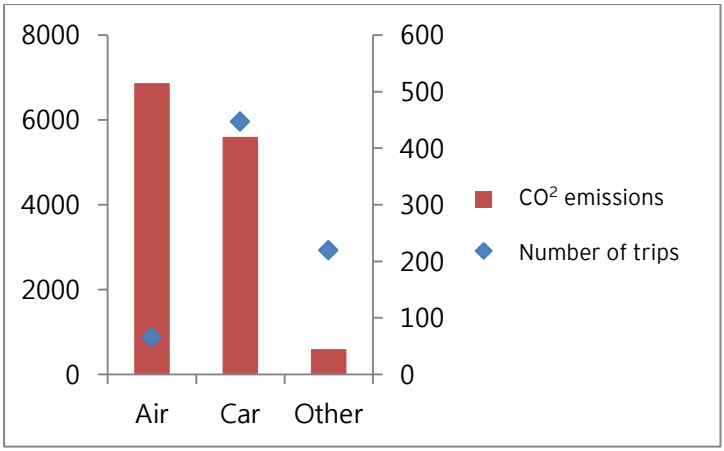

Figure 5: Number of international travels and associated CO_2 emissions in 2005 (in $MtCO_2e$, millions)

2.1.1.2 Land Transport

This guideline focuses on cars as the main mode of land transportation in the tourism industry. Cars are effective mostly for travel within the region and can be utilized by small groups of tourists. In addition, car transport options in the tourism industry are diverse because a traveller may choose to drive his own car, take a cab or rent a car.

The car transport sector is the second largest emitter in the global tourism industry. With the new Malaysian government policy in 2014 offering incentives for small, energy-efficient car production, the expected increase in fuel efficiency and use of hybrid or electric cars will

potentially allow this sector to reduce its environmental impact.

Of the different car transport options, this guideline will focus on the car rental business sector. From airports to local areas in travel destinations, travellers may easily find car rental services. After a period of decline, global industry analysts estimate that the industry is poised to recover and contribute USD 53 billion in revenue by 2015 (Global Industry Analysts, 2011). Therefore, rental cars are an important part of the tourism industry. Considering the size and the importance of the industry, a small effort to green the area would lead to a significant impact in the reduction of GHG emissions.

Although this guideline will focus on the car rental sector, many of the recommendations can be applied generally for other land transport options as well. For instance, hotels and tourist attractions can partner to provide shuttle buses which reduce the need for car rentals and thence mitigating transport emissions. As accessibility to tourist attractions increase, tourist arrivals will also rise, contributing to the economy of this industry.

2.1.2 Accommodation

The accommodation sector accounts for around 21% of tourism industry's GHG emissions (Figure 4). However, environmental impact mitigation effort in this sector is very important because there are many economical, easily-adoptable, and practical options that can lead to a significant amount of reduction.

This guideline will mainly focus on hotel, which is the most energy- and emission- intensive sub-sectors in the accommodation sector (Table 1) (UNEP & UNWTO, 2008). Nevertheless, this guideline can be useful to other types of accommodation as well as other built environment in the tourism establishments, such as shopping malls, recreational facilities and information centres.

Type of accommodation	Energy use per guest nights (MJ)	Emissions per guest night (kg CO_2)
Hotels	130	20.6
Campsites	50	7.9
Pensions	25	4.0
Self-catering	120	19.0
Holiday villages	90	14.3
Vacation homes	100	15.9

Table 1: Average energy use by accommodation types

Energy is one of the top three expenses for hotels. Hotels use significant amount of energy for a variety of purposes, mostly for heating (including cooking), cooling, elevators, and purifying water. Types of energy use may vary according to geographical location, size of hotels and destination. Therefore, through efficient use of energy, hotels may not only reduce GHG emissions but also achieve cost savings.

2.1.3 Tourism Activities

The GHG contributions from tourism activities stand at a low 4% of the total emissions (Figure 4). However, the majority of tourism activities happen outdoors. It is therefore paramount to have a clean environment to maintain the attractiveness of tourist destinations (UNEP & UNWTO, 2008).

Emissions from tourism activities are closely related to energy use. For example, a significant amount of energy is required to power a large leisure park like Legoland. Depending on the space availability and techno-commercial feasibility, large-scale renewable energy generation systems can be employed for lighting, heating, and various other uses.

Other tourist destinations in the region, too, will benefit

from this initiative. Taman Negara, for instance, relies on the beauty of its nature and favourable weather so that tourists can come for a hike or just a visit. With less GHG emissions in Iskandar Malaysia (IM), the likelihood of extreme weather in the region could be reduced and ultimately benefit the tourism industry.

Although tourism activities sector contribute a significantly smaller proportion of GHG emissions, it is clear that any efforts by any sector will not only affect its own sector but also every other sectors, just as how environmental changes would affect all sectors. For example, extreme environmental changes, such as depleting shoreline and destruction of corals, would discourage divers to fly into the region, decreasing demand for air flights into the destination as well as accommodation in the area.

Therefore, in order to promote sustainable business practices and profitability in the tourism industry, every stakeholder has to make active contributions in to creating a green economy in the industry. Stakeholders can aim to have their products and services eco-certified, which assures travellers that products or services are backed by sustainable practices and ethical commitment.

2.2 Potential Options

The interconnectedness of the different sectors in the tourism industry makes it important for businesses to be aware that no one green measure is specific to a particular sector. For example, a transport business is likely to look into improving its fuel efficiency because the bulk of its emissions are derived from that operation. However, the transport business also has office buildings and other built facilities. These are also areas for greening although, in other sectors, like the accommodation sector for instance, this will form the focus of its greening initiatives. Nevertheless, every sector has the same areas for improvements, albeit at different priority level, and actions could still be taken on those areas to mitigate environmental impacts.

Malaysia is home to a host of natural attractions that have garnered worldwide attention such as Mulu National Park and Kinabalu Park which are both listed as United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites. While promoting the natural attractions in the country to tourists, the Malaysian Government also realizes the importance of sustainable tourism, ecotourism and the balance between conservation and development. The Ministry of Tourism, Malaysia, has

adopted the National Ecotourism Plan (NEP) to provide policies and guidelines for the conscientious development of ecotourism. The NEP outlines action plans of the Malaysian government to create an ecotourism destination and includes accreditation of tourism-related goods and services, categorizing sites and activities and use of local services. More information on how the Malaysian government supports ecotourism can be found on www.corporate.tourism.gov.my.

Other than natural beauty and cultural attractions, another draw for the tourism industry is Meetings, Incentives, Conferences and Exhibitions (MICE). 'MICE' is a unique group of tourism sector that integrates almost all elements of a tourism industry. Businesses in the MICE sector are involved in many aspects of tourism from planning, booking, executing events, transportation, and logistics to hospitality (Figueroa, 2014). Each of the subsectors of the MICE sector invariably has the potential to be more efficient and greener.

The MICE sector can be broadly grouped into six categories (MCI Sustainability Services, 2014):

1. Audio-visual (AV)

   The AV businesses can look into running its

operations with more efficient equipment, turning off equipment when not in use and also to recycle used bulbs.

2. Event and activity organizer
   Businesses in this field generally involves in planning, design and execution of the event. Businesses can adopt more sustainable practice such as sending e-invites and using Information and Communications Technology (ICT) to replace paper-based agenda sheet

3. Venue
   Businesses in this subsector has direct impact from their operations. Equipment installed in the venue, such as convention center or exhibition hall, has to be energy-efficient to mitigate environmental impact.

4. Food and beverage
   For MICE activities, food and beverage are generally present in large quantities. Business operators should provide an accurate estimation of quantity required to reduce wastages. Moreover, business operators could also collect and treat the wastes properly.

5. Accommodation

   Accommodation providers such as hotels have a variety of avenues to be more energy-efficient. From the design of the building, equipment in the built environment to the operations of the building, hotel operators should implement sustainable operation and inculcate green practices.

6. Transport

   Transportation operators should explore running vehicles on renewable energy such as biodiesel or electric.

Following the analysis on key areas for intervention done by leading business practices in each sector, this guideline suggests that greening initiatives can be broadly categorized into the following issues:

Areas	Aspects
Facility Efficiency	1. HVAC efficiency 2. Lighting efficiency 3. Water consumption 4. Measurement of environmental indicators

Renewable Energy	5.	Developing renewable energy sources
Waste Management	6.	Reducing, recycling, and disposal
Transportation and Logistics	7.	Vehicle efficiency
	8.	Transport infrastructure
	9.	Air travel
Monitoring & Reporting	10.	Measurement of environmental indicators
	11.	Certification of products and services

Table 2: Summary of recommended actions

3. Recommended Actions for Strategic Direction and KPIs

3.1. Facility Efficiency

Improving facility efficiency can be achieved by implementing a range of technologies, from improved heating, ventilation and air conditioning (HVAC), lighting efficiency, monitoring (enabled by Building Energy Management Systems and Smart Metering) to implementing sustainable building designs.

3.1.1 HVAC Efficiency

Action: Installing efficient HVAC systems

According to the Carbon Trust, a 1°C decrease in internal warehouse temperature results in a 10% reduction in energy consumption (Carbon Trust, 2002). This would also lead to a proportionate decrease in GHG emissions. Recommended actions that can improve energy efficiency include (University of Twente, Unilever, 2013):

- Insulation: If some rooms are too hot or too cold, inadequate air sealing or insufficient insulation could be the cause. Cavity wall insulation is used to reduce heat loss by filling the air space with material that inhibits heat transfer. It is often used

in doors, which are the primary culprits of air leaks in the building. Adding additional insulation (double-glazing) around the interior of the building and installing air curtains will also contribute to reducing energy usage.

- Infrared Assessment: To identify areas of energy wastage, infrared imaging is a valued tool in identifying problems related to energy loss, inadequate insulation, inefficient HVAC systems, radiant heating, water damage on roofs, and much more. Conducting an infrared inspection on leak tightness and coldness infiltration can detect potential areas for additional insulation. Professional energy auditors can be employed to carry out this process.

- Heat Recovery Ventilation (HRV): HRV is an energy recovery ventilation system which uses heat exchangers to heat or cool incoming fresh air, recapturing 60%-80% of the conditioned temperatures that would otherwise be lost. Instead of opening a window for ventilation, the HRV system is able to provide fresh air without any heat loss or gain. In climates such as Malaysia with warm, humid weather, HRVs can also remove

humidity before it enters the air ducts to keep the interior comfortable and prevent the HVAC system from having to work harder.

- Alarm for warehouse doors: Alarms of annunciators indicate when doors are open and prevent unwanted heat loss or gain. This simple yet efficient measure has proven to be very cost effective in many cases.

- Green façade and roofs: Vegetation or plant cover on roofs over a water-proof membrane is known to reduce building heating and cooling needs. In addition, it can retain rainwater for other uses if an efficient drainage system is installed. This measure qualifies for Leadership in Energy and Environmental Design (LEED) points.

Image 1: Green Façade at Hotel B3 in Bogota, Colombia (Green Roofs & Walls)

Action: Maintaining efficient HVAC systems

Dirt and neglect are the top causes of heating and cooling system inefficiency and failure. It is important to have a qualified technician perform regular maintenance on the HVAC system every year. Maintenance activities include (US EPA, 2009):

- Lubricate moving parts. Electrical devices that lack lubrication can cause friction in motors and increase the amount of electricity consumption. Lack of lubrication can also cause equipment to wear out more quickly, requiring more frequent repairs or replacements.

- Check the condensate drain in the air-conditioner. If plugged, stagnant water in the drain may damage the hose, affect indoor humidity levels, and breed bacteria and mold.

- Inspect, clean, or change the air filter in your central air conditioner. A contractor can demonstrate how to do this for company maintenance staff to do so on a more regular basis.

- Clean the air-conditioner blower components and coils. Proper airflow over the coils allows your system to run efficiently, reducing energy costs and lengthening equipment lifespan.

- Check the central air conditioner refrigerant charge and adjust it if necessary to ensure it meets manufacturer specifications. Too much or too little refrigerant charge can damage the compressor, reducing the shelf life and increasing costs.

Leading hotels have discovered that regular maintenance of equipment promote efficient use of energy for their operations. International Tourism Partnership, in its guidelines for greening hotels, suggests hotels to conduct regular check and maintenance for all equipment, and identify simple changes that can lead to saving energy. London Marriott Hotel County Hall was able to save energy by 37% by cleaning filters and coils in air conditioners, and was also able to save significant amount of energy by changing cooling and heating running times in banquet rooms (Marriott International, 2013).

Action: Glazing

Transparent and clear glass panes used in buildings are prone to increase the heat gain inside buildings and hence additional air conditioning (higher capital and operating costs) becomes necessary. Proper selection of glazing properties helps improving energy efficiency in buildings as a good glazing will reduce solar heat gain from both direct and diffuse solar radiation (BSEEP, 2013). Better glazing efficiencies can be achieved by taking into consideration the following key factors (and other considerations as deemed appropriate for the building)

- Choosing the glazing with appropriate visible light transmission, low solar heat gain coefficient
- Single and double glazing low-E value coatings
- Reduction of glazing area, where possible

Action: Wall Insulation

Malaysia has a mild climate with outdoor dry bulb temperatures reaching 26.9^{0}C during day time and 24^{0}C during night time. Heat is both conducted from the outside into the building and as well as from inside of the building to the outside. While the impact of insulation on building

energy reduction may not be very significant, the effect on reduction in peak cooling load is certain. A feasibility study on the economics of insulation materials should be done before embarking on the installation of insulation systems (BSEEP, 2013).

Action: Roof Insulation

Energy efficiency brought about by different types of roofs varies for each type, operating hours and the space immediately below the roof. Ideally an insulated roof during day time to prevent heat gain and non-insulated roof during night time to cool the building would be the most appropriate one for Malaysian climate. However, business needs (office / hospital / warehouse / cold storage), occupant comfort, wind velocity, rains, etc. are the key decisive factors in determining the roof type and materials used. In a simulation study carried out while developing *The Building Energy Efficiency Technical Guideline for Passive Design (2013)* suggests that provision of 25mm of insulation provided maximum incremental savings. Keeping in mind the electricity tariffs in Malaysia are bound to increase with time, business need to evaluate the energy consumption, return on investment, business needs of roof insulation and proceed accordingly.

Action: Zoning and Infiltration control

Zoning is the process of positioning air-conditioned spaces in a building in a coherent fashion such that wastage of conditioned air is minimized. In general it is done by locating rooms according to the leakage flow of air-conditioned air from the coldest room will benefit other spaces before it completely escapes out of the building.

Zoning the most air-conditioned areas at the core of the buildings surrounded by comparatively lesser air-conditioned areas, optimizing window areas, converting glazed areas to opaque, etc. are among the widely practiced techniques to achieve energy efficiency.

Infiltration is the process of out-door air entering the air-conditioned space introducing sensible and latent (moisture) heat into the building, which increases the energy requirements. Sealing cracks in walls, window panes, controlling window/door operation with sensors, door pumps, air curtains could be adopted to minimize infiltration losses. Please refer the *Building Energy Efficiency Technical Guideline for Passive Design (2013)* for case studies on various scenarios of simulation conducted for more information on avoiding infiltration losses.

3.1.2. Lighting Efficiency

Action: Day light harvesting

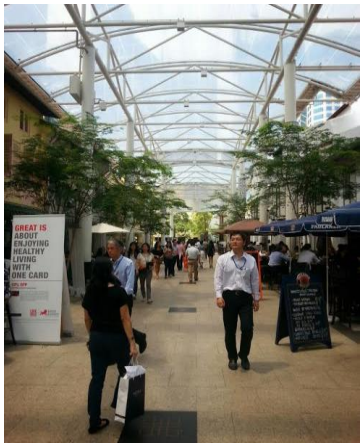

Image 2: Daylight Harvesting in Far East Square Singapore

Malaysia being located close to the equator, with lesser seasonal variation has reliable day light available for about ten hours a day. Natural day light harvesting is amongst the most efficient method to improve energy efficiency in buildings because diffuse light is not much affected by the sun appearing in the sky/hiding behind the clouds. To achieve better utilization of day light harvesting appropriate tropical climate day light harvesting techniques need to be deployed to gain the optimum benefits.

- Utilizing daylight to combine with artificial lighting is a simple, efficient way to reduce lighting.
- Analyzing the location, layout and orientation of windows (west / east), Incorporating skylights into roofing and utilizing transparent weather-resistant material that can maximize natural light passage is

one of the key measures to maximize use of daylight.

- Skylights that can be operated to open and close can additionally lead to savings in energy used for ventilation or cooling.

- Solar heat gain minimization, glare protection, deep day light penetration, uniform day light distribution, etc., needs to be investigated thoroughly, and addressed before implementation of a well-designed day light harvesting system to optimize performance.

Action: Switching to energy-efficiency lighting

In 2010, the *British Broadcasting Corporation* carried out a quantitative energy analysis and identified solid-state Light Emitting Plasma (LEP), Light Emitting Diodes (LED) and fluorescent lighting as the most energy-efficient sources (BBC, 2011).

Figure 6: Comparison of Lighting Types

LED is one of today's most energy-efficient and rapidly-developing lighting technologies. LEDs are "directional" light sources, which mean they emit light in a specific direction unlike traditional light sources which emit light and heat in all directions. For this reason, LED lighting is able to use light and energy more efficiently in many applications. Residential LEDs use at least 75% less energy, and last 25 times longer, than incandescent lighting (US Department of Energy, 2014).

As a cheaper alternative, high efficiency Compact Fluorescent Lighting (CFL) consumes 25% of the energy of an incandescent bulb and lasts nine times as long, or up to 7 years (Tufts University, 2014). Aside from its lower cost,

CFL bulbs are known to be versatile. They can be applied nearly anywhere that incandescent lights are used, and are particularly suitable for area lighting.

Hilton Properties in South Africa, in Sandton, Durban, and Cape Town, replaced traditional lighting with more than 17,000 energy saving LEDs. Through this effort, the hotels are estimated to save more than 2.6 million kWh of energy annually. This program, when fully implemented across Middle East and Africa, is expected to save more than 20 million kWh annually.

Action: Optimizing lighting performance

Many minor steps can be taken to improve lighting performance. For example, regular cleaning of light bulbs can also improve energy efficiency, as two years' worth of accumulated dust can reduce luminosity by as much as 50% and increase operating costs by 15% (Carbon Trust, 2007).

Utilizing daylight in combination with artificial lighting is another simple yet efficient way to reduce energy costs. Analyzing the location, layout and orientation of windows (west / east) can maximize the natural light passage.

To supplement this, motion sensors can also help to optimize lighting usage in a facility. Sensors switch off

lights when an area is not occupied, and may also dim lights according to the required output (University of Twente, Unilever, 2013).

Action: Shades

Shades are primarily used to reduce solar heat gain, widely practiced across the world and Malaysia as well. External shades are being replaced by advancements in glazing technologies and internal shades are still the most economical solution (but with regular maintenance/replacement). Different types of horizontal and vertical shades are utilized; however thermal comfort, brightness control, glare protection, privacy, view out, durability are the key factors that need to be considered before the installation of shades. Please refer the *Building Energy Efficiency Technical Guideline for Passive Design (2013)* for more information on application of shades, various pros and cons.

Image 3: Self shading and Dynamic shading system at ST Diamond Building (GreenTech Facilities, 2014)

Action: Applying for building certifications

Industry associations can play a vital role in providing guidelines and standards on building energy measures. In Malaysia, companies can consider applying for the Green Building Index (GBI), which assesses new and existing buildings for their environmental performance according to a range of key criteria.

Image 4: Hotel Penaga, a Malaysian hotel facility certified by the Green Building Index (GreenTech Facilities, 2014)

Iskandar Malaysia has set out in its Green Building Road Map to utilize the GBI as a rating tool for buildings in the region to promote sustainability in the built environment. In July 2013, a luxury condominium in IM, Molek Pine 4, became the second residential project in the country to achieve the highest GBI rating.

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Energy savings from measures to increase efficiency	Higher	Easy
Cost savings from measures to increase efficiency	Higher	Easy
Amount and % of reduction in carbon emissions in weight	Higher	Moderate
Building certifications (e.g. GBI)	Lower	Moderate

In this section, this guideline provides measures to reduce energy consumption in facilities and to lower GHG emissions. Areas to target are HVAC and lighting, where most of the energy is consumed.

Facility efficiency is principal to a green economy, and this is acknowledged by both the Malaysian Federal government as well as IM. Malaysia follows the Low Carbon Cities Framework & Assessment System, developed by **Ministry of Energy, Green Technology and Water (KeTTHA)**, which recommends specific carbon reduction solutions in

buildings and infrastructure. Malaysia has also launched the GBI to rate commercial and residential buildings. Both buyers and builders of green buildings stand to benefit from this scheme. Some of the benefits that businesses could enjoy include:

- Investment Tax Allowance for purchase of Green Technology Equipment

  Businesses could receive tax allowance of up to 100% of qualifying capital expenditure in relation to approved green technology projects or acquisition of green asset
- Income Tax Exemption on the use of Green Technology Services and System

  Businesses could receive tax exemption of up to 100% for a period of 5 years in respect of the use and provision of green technology services and systems

More information on incentives can be found at GBI website, KeTTHA website and Malaysia Budget 2015 speech by YAB Dato' Sri Mohd Najib Tun Abdul Razak. Relevant website links can be found at the end of the manual.

IM aims to be an internationally recognized sustainable

metropolis, and has imposed a building rating system along GBI for their new developments to identify and monitor building sustainability. Businesses should refer to Iskandar Regional Development Authority's (IRDA) Low Carbon Society Blueprint and Actions for a Low Carbon Future that promote adoption of green building designs and features. Some of the benefits that businesses stand to receive from the policies include:

- An adjustment to tax rate on fixed asset tax
- Tax incentives on green development
- Low interest loans for energy-efficient building projects
- Subsidy for adopting photovoltaic power (Iskandar Regional Development Authority, 2014)

More information on incentives available from IRDA can be found at www.irda.com.my.

3.2. Waste Management

A waste management plan with specific targets, strategies and initiatives helps hotels to minimize waste that goes to landfill, increase recycling and re-use, and eventually lower environmental impact. In line with IRDA's waste management blueprint, hotels should focus on:

- Applying the waste management hierarchy

(eliminate, reduce, reuse, recycle, disposal),

- Raising public awareness on the importance of waste minimization and recycling through Public-Private Partnerships (PPP), and
- Consider investing in sustainable technologies to manage solid waste.

Action: Seeking partnerships to recycle products

Hotels use many kinds of disposable products, furniture and appliances that need to be replaced regularly. Large hotel groups often seek partnership with other organizations to effectively recycle their waste.

It is estimated that hotels in the US discard 2.6 million bars of soap daily. Initiatives such as Clean the World and Global Soap Project, allow hotels to donate used soaps and other hygiene amenities. The collected soaps are processed into new bars and distributed to impoverished people in need of hygiene products (Global Soap Project, 2014).

Hotels have to replace mattresses regularly. Mattresses are large in size and hard to crush or incinerate. Also, used mattresses cannot be donated or reused due to hygiene reasons. Hilton Worldwide partnered with DH Hospitality

and Serta and developed a way to recycle 85% of mattress materials into new products such as tools, car parts, flooring and carpet padding. As a result, Hilton Worldwide recycled over 9,200 mattresses from 14 hotels, and more hotels are expected to participate in the near future (Hilton Worldwide, 2013).

Action: Reducing material volume of packaging

There are a variety of estimates available on the weight of consumer packaging, which is typically put at around 5% of the total weight of consumer goods shipments (WEF, 2009). The carbon abatement of eliminating packaging is significant in the production phase of the lifecycle – at up to 125 $MtCO_2e$ per year globally (WEF, 2009).

Businesses, in particular souvenir manufacturers or retailers, should maximize packaging by using lighter material or re-designing packaging to reduce the volume of material used. Efficient and light-weight packaging not only reduces GHG emissions through savings in number of trips of deliveries, it also saves cost through the reduction in material used. For example, when a company uses 25% less plastic or cardboard per unit, it will be able to fit 25% more product per pallet, resulting in fewer shipments, lower transportation and raw material costs (Inbound Logistics,

2009).

Action: Disposing food waste and distributing surplus food

Hotels generate a large volume of food waste. Hotels may reduce food waste through careful menu planning, avoiding individual packages, and etc. Food waste can be recycled as compost and fertilizer, and can also be used to generate energy. Many hotels also establish or participate in food donation programs as well.

A time tested treatment for food waste is biogas generation, leading to energy for use as fuel for cooking Food waste disposers (FWD), which are commonplace in North America and Australia, shred food waste to be sent to treatment plants. At the plant, the waste undergoes the process of anaerobic digestion and generates biogas. After the biogas is treated and the carbon dioxide is removed, it can be used as a direct replacement for natural gas to generate energy (D'Souza, 2014).

In the UK, Marriott partnered with Convert2Green to turn its waste cooking oil into biodiesel. Convert2Green collects waste cooking oil and refines it into biodiesel; then, Marriott's food vendor fuels the biodiesel to deliver food back to Marriott. Through this process, Marriott recycled

40,000 litres, which is 18% of cooking oil equivalent to 91.14tCO_2e of carbon savings (Marriott International, 2013).

Hilton partnered with Feeding America, a hunger-relief organization, and the Global FoodBanking Network, an organization dedicated to spread food banks around the world. Through the partnership, safe, surplus food from conferences or daily operations are collected and delivered to those in need. In only six months, participating hotels donated over 17,000 pounds of food, which is equivalent to more than 16,500 meals (Hilton Worldwide, 2013).

Key Performance Index

Performance Index	Objective	Ease of implementation
Waste reduction	Higher	Moderate
Tons of total waste output	Lower	Moderate
Waste intensity (kg per occupied room)	Lower	Moderate
Waste intensity (kg per square meter)	Lower	Moderate
Total amount of recycled materials by	Lower	Easy

weight (kg)

Table 3: key performance index for waste

Malaysia has a National Strategic Plan for Solid Waste Management that emphasizes the 3R's- Reduce, Reuse and Recycle and can be found on the Ministry of Housing and Local Government's webpage, www.kpkt.com.my. The Government of Malaysia seeks to transform the recycling industry into a remanufacturing industry, especially the automotive industry, to improve the life cycle of products and materials.

Businesses can also look into IRDA's Integrated Solid Waste Management Blueprint in order to adopt initiatives to improve waste management. The blueprint consists of strategies that are in line with international leading practices and the National Strategic Plan for Solid Waste Management and has been developed to be more relevant to IM. In addition, the blueprint has also listed waste facilities in IRDA that will make business operations at IM more sustainable and green.

More information on waste management can be found at www.irda.com.my

3.3. Water Management

Water availability is increasingly becoming a global issue. UNEP has identified water shortage as one of two major environmental issues that the globe is facing today (Monash University Malaysia, 2014). Water-rich Malaysia, too, is not impervious to this impact of climate change on water security. The *New Straits Times* has reported that the Klang Valley water rationing in June 2014 has affected 3 million consumers. This incident is not localized either; other areas, such as Gombak, Kuala Lumpur and Petaling, were faced with the same predicament.

As it is, Malaysia registers as one of the high water consuming populations in the region. At an individual level, *Business Insider Malaysia* has estimated that Malaysians use 226 litres per person per day. This is significantly higher than Singaporeans, who

Businesses should play key role in conserving water because water scarcity directly affects their operations. During Malaysia's water crisis in early 2014, *Bloomberg* has reported that Malaysia's Top Glove Corporation had expected a cost increase as much as 10 times due to water shortages. *Bloomberg* has also found that another electrical products company in Malaysia had lost a RM40 million order due to uncertainty in water supplies.

register 154 litres per person per day, and Thais, who register 90 litres per person per day. Malaysians need to reduce their water intensity level by 37% to achieve the recommended 165 litres per person per day. One of the reasons to explain this water intensity level is the low to free water tariffs that create a wasteful habit. This habit could translate into increased wastages in work environment as well. Not only do businesses suffer from paying additional costs, the sheer volume of water consumed by industries exponentially worsen the situation, leading to accelerated water scarcity.

Action: Installing sensors, switching equipment into low flow mode and other water-saving fixtures

Approximately 85% of water usage in hotels comes from showers, toilets, taps and kitchens. Therefore, adopting water saving fittings in guest rooms, kitchens, and public area will help to reduce water consumption. Low flow fixtures installed on taps and showerheads and high efficiency dual flush toilets, for instance, reduce water consumption.

Intercontinental Hotels Group (IHG), as a part of its IHG Green Engage program, shared water saving technologies with its hotels. Holiday Inn Flinders in Australia invested about RM62,000 in low flow mode and saved 50% of water

consumption in 18 months. Holiday Inn San Antonio International Airport in the US started a water-saving programme and reduced 40% of water consumption per occupied room. This is estimated to save more than 7 million gallons of annual water consumption annually (InterContinental Hotels Group, 2014).

Action: Applying water-saving strategies and technologies for laundry and housekeeping practice

Utilizing water-saving technologies can be a cost competitive way of reducing water consumption. By introducing water-saving technologies in routine process, such as laundry and housekeeping, hotels may easily reduce water consumption.

Hilton Worldwide has partnered with several suppliers to utilize sustainable products and technologies in its hotels. With improved laundering technologies, hotels were able to reduce water consumption by 45% and energy consumption by 43%. Furthermore, the new technology extended linen life by 40%. In addition, the new housekeeping products developed reduced water consumption by 30% (Hilton Worldwide, 2013).

Marriott implemented a system that reduced the amount of water and energy requirement for linen laundry. By using

less water and lower temperature water, it is estimated that Marriot saved more than 100 million gallons of water and 2,000tCO_2e of GHG emissions (Marriott International, 2013).

Action: Minimizing water use by recycling and capturing other opportunities

Hotels may save water by recycling water for gardening, flushing toilets, cleaning or capturing opportunities to reuse rainwater. Holiday Inn Select San Antonio Airport was recognized for its efforts in saving more than 7 million gallons of water in 2008. It achieved this through conservation practices which included low flow showerheads, water-saving faucet spigots, and diverting condensation from air-conditioning units and pool backwash for reuse (InterContinental Hotels Group, 2014).

Condensate is produced by air-conditioning systems as they remove moisture from the air during the cooling process. The two main factors for condensate collection are climate and building type. The tropical climate in Malaysia, which is usually warm and humid, has relatively good potential for condensate collection. Depending on the location of the air-conditioning system with respect to the planned reuse location, the hotel may directly drain the

condensate or utilize a small pumping station (Lawrence & Perry, 2010).

3.4. Renewable Energy

Action: Utilizing renewable energy sources

There exist a number of renewable energy sources that can be utilized depending on the geographical. Some of the popular renewable energy sources are wind, solar, biogas, geothermal, etc. These alternative power sources reduce environmental impact by not only emitting less GHG but also using fewer sources that deplete and destroy natural resources.

Image 5: Diangujinjiang International Hotel of Baoding, a 5-star hotel in China with solar panels installed (XinHua News, 2009)

Buildings can incorporate solar panel roofing as its green features. In the past, only large hotels were able to utilize solar energy due to the large initial investment required to install solar panels. However, in the last few years, small hotels have started installing solar panels for its long term

benefits. Carr Manor, a small boutique hotel in Colorado with only 16 guest rooms, invested about RM270,000 for installation of 10,000 watt solar panel. Along with installing energy efficient lighting, Carr Manor was able to reduce its energy demand and energy bills by more than 50% (Carr Manor, 2014).

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Energy intensity	Higher	Moderate
Water intensity	Higher	Moderate
Electricity generated from renewable sources	Higher	Moderate

3.5. Vehicle Efficiency

Action: Offering a selection of alternative fuel or energy efficient vehicles

Image 6: Proton GEN.2 Hybrid (Car **Advice**)

Globally, the large players in the rental car industry are offering sustainable options for customers: hybrids, electric vehicles (EV), and clean diesel vehicles. This option allows customers to travel green but also lets them experience the sustainable cars which may lead them to eventually consider purchasing these cars in the future.

The largest limitation for EVs is that they cause "range anxiety" to drivers. EVs require infrastructure that needs input from many stakeholders. While providing EV as an option to customers, rental car companies can help expand the market by cooperating with EV manufacturers, charging stations, non-governmental organisations, government, etc. These sustainable options are highly fuel efficient, which average over 48 mpg (Hertz, 2012).

In Malaysia, vehicle manufacturers are set to capitalize on the government's incentives under the national automobile

policy for energy efficient cars. Honda launched the country's first hybrid facility in January 2014 to assemble small models and hybrid vehicles for regional markets. Leading local automobile manufacturer Proton is also set to compete in the energy efficient vehicle market, with the planned production of its own hybrid model (Borneo Post, 2014).

Action: Conducting maintenance regularly

Major rental car companies around the world operate with newer and well maintained fleets. Cars are usually less than six months old and are regularly maintained, so the new engines enable a fuel efficient performance. The average fuel economy of US light vehicles is 25.4 mpg (Gagnier, 2014). Enterprise, one of the largest rental car companies, reported that 28% of its vehicles average 32 mpg or better, an improvement of almost 28% from the average car (Enterprise Holdings, 2014).

3.6. Transport Infrastructure

Action: Providing real time navigation system

Rental car companies may contribute to reducing GHG emissions by installing Global Positioning Systems (GPS) in the vehicles. GPS provides real time traffic information,

allowing drivers to save time and avoid unnecessary emissions on the road. More advanced technology that provide real time traffic information along with estimated GHG emissions for route options may allow drivers to choose shorter or more fuel efficient routes.

Achieving lower fuel use as a result of lower mileage is just one of the benefits of telematics. In one study, the telematics system identified a 50% difference in fuel economy being achieved in identical cars for similar journeys. Much of the excess fuel was being wasted from excessive speed and harsh acceleration. These insights on driving style allow companies to identify where action may need to be taken (Energy Saving Trust, 2011).

From the combination of fewer miles and improved driving style, fuel use and carbon emissions can be cut by 15%. In addition, this information can be used to identify safety issues which could cut crash costs by up to 50%. All in all, figures suggest that increased vehicle optimization and higher productivity can reduce operating costs for the company by 10% (Ron, 2014).

Action: Installing electronic toll tags

Toll plazas are located in the heavily travelled areas. Therefore, toll plazas that operate manually cause heavy traffic, especially during rush hours. Long queues and frequent stops lead to increase in emissions. By installing electronic toll tags in the vehicles, rental car companies may contribute to reducing GHG emissions. A study has revealed that the use of electronic tolls lead to higher throughputs and less delay, which results in reduction of hydrocarbon and carbon monoxide emissions by 40% to 63%, and nitrogen oxides by 16% (Saka & Agboh, 2002).

Image 7: Electronic Road Pricing in Singapore (Wikipedia)

Action: Encouraging sustainable driving

Image 8: Fuel-efficient driving simulator (*International Road Transport Union)*

Rental car companies may provide customers guidance for fuel efficient driving. This can be translated into training sessions for employees as well. Drivers can reduce fuel consumption and carbon emissions with better driving habits.

Action: Providing frequent shuttle bus services

Hotels and tourist attractions can form partnerships to provide shuttle bus services to and from tourist attractions.

Image 9: Namsan Tour on electric bus, South Korea (*Flickr*)

The provision of shuttle services or

increased shuttle service time slots would reduce the need for tourists to rent cars to get around. The accessibility to different sites would increase tourist arrivals to the area as well as increase the number of stays in hotels with high accessibility. Furthermore, with the transportation facility under direct control of the business management, businesses can make decisions that mitigate environment impact. Shuttle bus services can thus help mitigate transport emissions from this industry.

Key Performance Index

Performance Index	Objective	Ease of implementation
Fuel efficiency (mpg)	Higher	Moderate
CO_2 emissions from transport	Lower	Moderate
Shuttle bus services	Higher	Easy

3.7. Air Travel

There are many initiatives that are being taken by airports and airlines alike to ensure sustainable growth of the industry.

Action: Allow consumers to choose to fly carbon neutral

Flying carbon neutral can be a voluntary option for guests who wish to neutralise the carbon emissions from their flight. A number of carriers such as Qantas, Virgin Australia, and Jetstar accept a small contribution from passengers to purchase a government approved carbon offset which effectively neutralizes their carbon footprint (Qantas, 2014).

Image 10: Qantas & Virgin Australia, amongst the early airline carriers that have a carbon offset program for travelers (Sydney Morning Herald, 2014)

In 2011, with funds from Malaysia Airlines' carbon offsets, 1,000 saplings were planted in the South East Pahang Peat Swamp Forest and another 1,519 were planted in 2012. With such environmental leadership from the national carrier, other airlines that operate in Senai International Airport can consider offering a similar option.

3.8. Monitoring & Reporting

Action: Development/Adoption of green technologies

The ICT-enabling effect involves the introduction or improvement of ICT to reduce environmental impact and/or greenhouse gas emissions. For instance, the development of video conferencing has reduced the need for corporate air travel as meetings can be done through video conferences. An analysis by Global e-Sustainability Initiative found that ICT is crucial to mitigating climate change and could enable emissions reductions of 7.8GtCO_2e, or 15% of GHG emissions (GeSI, 2008). Adopting and developing ICT can help with environmental initiatives and cutting costs.

Action: Create a 'carbon budget' during monthly/annual strategic meetings

Companies can create a carbon budget to ensure that they meet carbon emissions targets. This sets a goal for their

employees as well as discloses the company's interest in reducing emissions. A detailed carbon budget comes with a clear emissions reduction plan for the long-term which can provide direction/guidelines for staff. A carbon budget sets short-term emissions goals and allows for frequent monitoring and review compared to an emissions target over a period (Gilbert & Reece, 2006).

Action: Measuring environmental indicators

Image 11: Engaging in discussion

A Building Energy Management Systems (BEMS) is a computer-controlled automation system which aims to create the safest, most comfortable environment possible at the lowest possible cost. On average, BEMS save about 10% of overall annual building energy consumption, and more than half of all buildings in the U.S. larger than 100,000 square feet have one (Brambley, 2005). This is achieved through:

- Building system automation: This can be done according to time, type of day, or environmental conditions. For example, the BEMS can control

lighting to avoid unnecessary use of energy outside normal working hours or when ambient daylight levels are adequate (Sustainable Energy Authority of Ireland, 2014).

- Provide energy monitoring and management information. The BEMS provides users with easily available data on energy flows, consumption, trends and overall building performance. Companies such as Siemens even have professionals at their operations center to evaluate the data collected and create comprehensive reports to identify ways to improve energy usage and achieve additional savings.

The IHG launched the *IHG Green Engage* in 2009 with the purpose of reducing energy consumption by monitoring energy usage data. With more than 2,600 hotels participating, the program provides recommendations on energy saving strategies and technologies according to the location and climate zone which guides the hotels to adopt the most effective strategies to save energy. With over 16,000 green solutions implemented in 2013, *IHG Green Engage* can help hotels to become 25% more energy efficient (InterContinental Hotels Group, 2014).

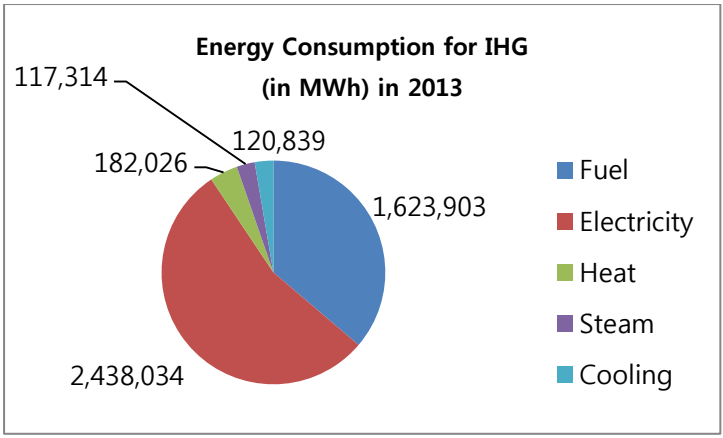

Figure 7: Energy consumption for IHG in 2013 (InterContinental Hotels Group, 2014)

According to the data collected from *IHG Green Engage* program, electricity consumption was identified as the most costly aspect of IHG's energy consumption. IHG identified the electricity area as the potential area to reduce consumption without diminishing staff and guest's values. Some of the measures to reduce electricity consumption include efficient lighting design, energy-saving products, on-site power generation and effective energy controls and management. IHG plans to install more master switches, which detects guest room's occupancy. This system has potentials to save 25% of energy use by shutting down electricity during the time when guest rooms are unoccupied (InterContinental Hotels Group, 2014).

Action: Attaining eco-certification for products and services

Stakeholders can have their tourism-related goods and services certified as eco-friendly or sustainable by external organizations. Sustainable tourism certification is voluntary and there are many certification programs worldwide. Certification educates the company on good environmental practices and provides tourist with a reliable environmentally and socially responsible travel option. The International Ecotourism Society provides information on certification types and guides in a handbook available on their website at www.ecotourism.org. In Malaysia, the Malaysia Ecotourism Association operates by having companies registering as a member and participating in activities such as the Malaysian Ecotourism Summit & Expo. More details can be found at www.mea.memberlodge.org.

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Number of records of energy consumption	Higher	Moderate

3.9 Educating and Training Employees

Employees are the drivers of businesses on the ground. A well-intentioned environmental strategy from the management without the support of the employees to implement it correctly would subvert the effectiveness of the strategy. Similarly, eco-friendly equipment in the hands of an untrained employee will be ineffective. Hence, it is essential to have an educated and trained workforce that shares the management's concerns and ambitions to build a green and sustainable business.

Businesses should embark on strategic programs and initiatives to build on their capacity for improving environmental performance. Activities to educate and train the company's employees on environmental issues, such as climate change, could motivate employees to be more involved and committed to greening the company and thereby contributing to green economy in IM. For example, an understanding of the deleterious health effects of GHG enables employees to support the management's goal to reduce GHG emissions. Employees could become more dedicated and actively participate in sustainable development activities realizing that their welfare is directly affected by such emissions.

It is essential for employees to be made aware that they too have an impact on the environment. Firms could introduce a system that reveals to employees their impact on the environment. For instance, Woh Hup Pte Ltd in Singapore has implemented an environmental management system that monitors on a daily basis the energy, water and generated by the company. These figures are on display in prominently visible areas, such as lift lobbies and pantries, so that employees are reminded of their daily environmental footprint. Individual electric meters were also issued to staff to monitor personal electrical consumption per day. In this manner, employees could relate to their environmental performance, monitoring in real time the impact of their consumption or savings.

Employees could also participate in seminars and conferences as a way for sharing and learning opportunities. For instance, Universiti Utara Malaysia organized the International Conference on Management and Business Sustainability in 18-19 August 2014 that aimed to facilitate exchange of ideas to attain sustainability through business transformation (Universiti Utara Malaysia, 2014). Alternatively, business owners could conduct in-house training with the assistance of

IRDA's environment team or other experts such as the Malaysian Green Technology Corporation to customize training specifically to business operations.

Ultimately, businesses should aim to have a workforce educated and trained in sustainability topics as a matter of business strategy. With adequate awareness and training, employees would be better equipped to contribute to developing successful solutions. Finally, businesses are the beneficiaries of the cost-savings and subsequent profits generated by such an environmentally-conscious workforce.

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Number of hours of sustainability training per employee	Higher	Easy
Number of training sessions organized by company	Higher	Easy

3.10 Compliance to Local Regulations

As a commercial entity present in Malaysia, businesses should as a first and essential requirement abide by the rules and regulations of the country. Compliance to regulations is a non-negotiable requirement before businesses can fully benefit from this guideline to further improve on the sustainability and green initiatives of business operations.

Malaysia has numerous prevailing national standards and also international standards that businesses are encouraged to adopt. Compliance to authorized standards acknowledged by the Malaysian government is complementary to the recommended actions proposed in this manual. Some examples of recommended standards that businesses are encouraged to comply with are the MS1525, ISO14001, ISO18001 and ISO50001. In addition, businesses can also look to have their products certified MyHijau and disclose their GHG emissions performance through MYCarbon reporting.

The MS1525 is a code of practice pertaining to energy efficiency and use of renewable energy for non-residential buildings. Developed by the Department of Standards, Malaysia, this code primarily focuses on energy efficiency

in buildings. In general, the code distinguishes between passive measures and active measures that building owners could adopt. Passive measures consist of recommendations relating to architectural and passive design strategies and the building envelope. Active measures correspond with lighting, power and distribution, air conditioning and mechanical ventilation and energy management systems. The adoption of the recommendations in MS1525 would help businesses to eventually reduce energy consumption and minimize use of non-renewable energy sources while maintaining a safe, healthy and comfortable environment for building occupants.

Businesses may also adopt the international standards from the International Standard Organization (ISO) as an alternative to the Malaysian Standards. The ISO is not only an independent non-governmental membership organization; it is also the world's largest voluntary developer of international standards, covering more than 19,500 standards across all industries. Common ISO standards that businesses adopt are the ISO 14000 (environmental management), ISO 18000 (occupational health and safety) and ISO 50001 (energy management system). This manual encourages business to consult and

consider the ISO standards in addition to the Malaysian Standards.

Moreover, businesses with green features built into their products can look to be certified under MyHijau for enhanced consumer confidence and to demonstrate their commitment to sustainable development. The MyHijau Mark is an internationally-recognized environmental and ecological label. Products labelled MyHijau can be featured in the MyHijau directory which helps businesses to promote their environmentally-friendly goods (Malaysia Green Technology Corporation, 2013).

Businesses could also seek disclose their GHG emissions performance through MYCarbon. The Ministry of Natural Resources and Environment Malaysia has instituted the MYCarbon Programme, which acts as the National Corporate GHG Reporting Programme for Malaysia. The advantage of engaging in a reporting exercise includes creating the awareness in business owners of the importance of measuring and reporting on emissions. This could also eventually lead to efforts put into management of the measurable, such as GHG emissions or energy use, creating better products, services and operations.

3.11. Case Study

3.11.1. Siloso Beach Resort

Image 12: Guests live close to nature (Siloso Beach Resort, 2014)

Since its opening in 2006, Singapore's Siloso Beach Resort has been guided by a simple philosophy – harmony with the environment. Built from conception to be an "eco-resort", unconventional construction techniques were used to build over 200 hotel rooms while preserving the natural flora and fauna in its surrounding environment. The resort's vision is to allow guests "to experience a quality eco-friendly environment that will encourage them to adopt eco-friendly initiatives" (Siloso Beach Resort, 2013).

In its materiality assessment of key environmental issues, Siloso Beach Resort identified (1) use of natural resources, (2) energy consumption, (3) atmospheric emissions, (4) water consumption, (5) waste, and (6) biodiversity as high

priority issues to focus on. Selected examples of the resort's environment initiatives to mitigate these issues will be summarized below (Siloso Beach Resort, 2013).

a) Natural resources: Siloso Beach Resort has been committed to use recycled materials within its facilities. Examples include:

- 100% of the furnishings that make up the children's playground had been collected as unwanted material from second-hand sources.
- 100% of all the resort's main corridor carpets have also been changed to recycled rubber mats.
- 23% of the stairways have been made from recycled wood from dismantled train rails in Australia.

Image 13: Energy saving technology has resulted in consumption that is well below the top 50% of hotels in Singapore (Siloso Beach Resort, 2014)

b) Energy consumption: Siloso Beach Resort adopts a progressive approach to energy management which is made up for 4 phases. From its conception, the hotel was designed to be energy efficient through good structural design. Next, once the hotel was built, numerous energy efficient technologies and appliances have been and continue to be implemented. These include the installation of LED and CFL lights, energy efficient pumps, balanced wave technology (that reduces energy loss from the heating system), window films (that keep the guest rooms cool by filtering sunlight), and a third generation modular heat exchange chiller system. Following that, numerous management guidelines were put into place to guide employees and encourage guests to adopt environmentally-friendly practices. Finally, the

resort now sets out to practice environmental leadership by sharing its best practices with others.

One of Siloso Beach Resort's unique initiatives to conserve energy is the installation of a rooftop garden. The garden provides vegetation coverage and acts a natural cooling system for the space below. The open structural concept of the resort also plays a significant role in passively reducing energy use from natural lighting and air flow. It is estimated that 70% of the resort are open air spaces.

Image 14: Rooftop Garden of SBR (Siloso Beach Resort, 2014)

c) Water management: In addition to water saving appliances and policies, Siloso Beach Resort is in the unique position of having discovered a natural underground spring reservoir during construction. Since then, it has treated and utilized the spring water for use in the swimming pool, gardening, and cleaning activities, which made up 18% of total water consumption in 2012. Furthermore, the swimming pool functions in a natural closed-loop system in which sand filtration, salt ionization,

and a decantation process are used to treat the spring water as it flows to and from the pool.

Another 6% of water consumption at the resort in 2012 comes from recycled rainwater from the aforementioned rooftop garden. The rooftop garden is made up of plant containers which are connected to a drain that harvests and filters rainwater. The water is then used in turn to water the plants and the excess will be treated and used for the swimming pool.

d) Waste Management: In addition to promoting the recycling of paper, plastic, and cans, 100% of Siloso Beach Resort's food waste is entirely recycled through either a food composting machine or vermicomposting (using earthworms). The food decomposer reduces all organic waste into liquid within 24 hours and channels it back to the public wastewater treatment. The vermicomposting method allows food waste to be eaten by earthworms and turned into

Image 15: Systematic waste recycling program (Siloso Beach Resort, 2014)

vegetable fertilizer. In 2012, the amount of waste recycled through both methods amounts to approximately 18,000 kg.

In addition to its sustainability efforts, the resort also actively organises various outreach and community education programmes. To date, more than 5,000 people from businesses, schools, and other organisations have toured the resort and learned about its environmental features (National Climate Change Secretariat , 2013). It also publishes a sustainability report annually to disclose information and performance statistics with regards to their green practices.

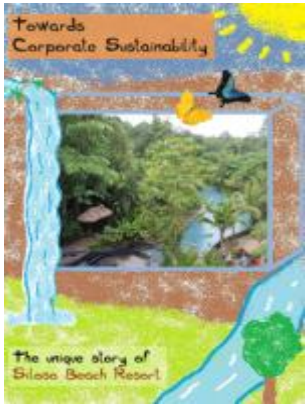

Image 16: Siloso Beach Resort's Sustainability Report 2013 (Siloso Beach Resort, 2014)

For its efforts, Siloso Beach Resort has been the recipient of 5 major sustainability awards and certifications in the last 3 years. These include:

- Singapore Environment Achievement Awards 2010 – Top Achiever

- Singapore Sustainability Award 2011 – Top Achiever
- First eco-certified hotel in Southeast Asia from TUV Rheinland
- First eco-certified hotel in Singapore from the Singapore Environment Council (SEC)
- The President's Award for the Environment – for being an outstanding example of a corporate entity that places environmental sustainability at the core of its business philosophy, Siloso Beach Resort was the first hotel to be given this award.

3.11.2. Frangipani Langkawi

The Frangipani Langkawi Resort & Spa is a beachfront eco-friendly resort located in Langkawi, Malaysia, that is recognized as Asean's Green Hotel of Langkawi. Due to Langkawi's popularity as a tourist destination, Frangipani Langkawi has enjoyed many tourist visits since it's refurbishment in 2006. It is the first resort in Langkawi to implement green practices to preserve its environment.

Image 17: Guest Recycling at Frangipani Langkawi (Frangipani Langkawi, 2014)

The staff of Frangipani Langkawi recognizes their impact on the environment and have incorporated sustainable management practices to operate cohesively with their natural surroundings. This encourages responsible tourism by implementing green practices to alleviate environmental impact and educate tourists on sustainable living. The Frangipani focuses on:

- Waste Management
- Water Conservation
- Energy Conservation
- Repair and reuse of materials
- Organic gardening

Frangipani Langkawi has an established waste management program involving (1) Reduce, (2) Reuse, (3) Recycle and (4) Rethink. This is done through initiatives such as reducing use of bottled water, reusing old furniture for staff quarters, using old roof tiles and pipes, recycling wood for signage and key chains, using broken slates to make decorative walkways (pictured above), and using leftover guest soaps as cleaning detergent for toilets. The Frangipani also sorts its waste and sends its inorganic waste to a recycling facility as well as composts its organic waste to use as fertiliser.

Image 18: Decorative Walkway (Frangipani Langkawi, 2014)

The resort aims to achieve water neutrality or use less than 10% of government supplied water. This is done by collecting rainwater in various water tanks to be used for gardening and cleaning purposes. Wastewater is filtered with sediment from local sources and UV light.

Image 19: Solar hot water system (Frangipani Langkawi, 2014)

Energy conservation is also an area of focus for Frangipani, where all electrical appliances are switched off when not in use and using energy-saving equipment within the resort and its offices. Frangipani Langkawi also uses a solar hot water system (pictured right), where solar energy is harnessed to heat water and save energy.

To extend the lifespan of their products, staff members refurbish the resort by reusing or repairing materials. For instance, Frangipani Langkawi practises repairing bathroom doors that often need to be replaced due to exposure to humidity. The Frangipani also reuses its discarded cooking oil by making candles with locally grown lemongrass, which acts as a mosquito repellent. Old and broken items are also used during refurbishment, such as using broken fans as lampshades and wine bottles as decorative lights.

Image 20: Repairing a bathroom door (Frangipani Langkawi, 2014)

Image 21: Reusing materials (Frangipani Langkawi, 2014)

Frangipani Langkawi encourages its staff to plant their own herbs and vegetables to offset their carbon footprint by buying less imported fresh produce. Chickens and ducks are also reared within the compound to supply eggs and meat to the resort's kitchen and help the resort be self-sustaining.

Other than the focused areas for green practices, Frangipani Langkawi also shares their best practices by inviting tourists and other hotel owners to learn more about their resort through exhibitions and resort tours.

Tourists can also engage in eco-friendly activities such as traditional fishing and planting a tree at the resort to offset carbon emissions. Frangipani Langkawi also engages local schools to learn about organic farming where the resort purchases children's farmed yields to award the children.

4. Social Responsibility

The promotion of sustainable business practices, respect for labour and human rights and transparency through disclosure are increasingly expected from responsible businesses. Democratic freedoms, ethical behaviour and good governance, the rule of law, property rights and a thriving civil society create fertile conditions for private sector led growth. The absence of such safeguards takes individuals out of markets, reduces innovation, restricts access to opportunity and drives political instability and conflict.

Forbes has reported that human capital is an increasingly scarce resource in a global economy. It is deemed by many experts as the most important segment of a business' value chain. In the war for talent, companies with excellent human rights track record are consistently ranked high on Employer Branding surveys. This helps in attracting and retaining this key resource, contributing to lower rates of staff turnover and higher productivity, and increasing employee motivation.

Businesses should also note that institutional investors, pension funds and equity firms are increasingly taking ethical factors such as human rights into account in their

investment decisions. More than 1,260 signatories with USD 45 trillion Assets under Management have adopted the UN Principles for Responsible Investment (www.unpri.org), including the Harvard University Endowment. This represents an opportunity for businesses to highlight their human rights credentials in an increasingly enlightened and cautious market.

4.1. Human rights, labour standards and ethical behaviour

Respect for human rights is no longer a good to have but a prerogative of every aspiring country. Businesses that neglect human rights are also liable to boycotts, litigations and backlash by increasingly vocal and militant stakeholders. MNCs like Nike have been accused of exploiting low cost labour and have faced public pressure to introduce better working conditions and a minimum wage.

As reported by *Business Insider*, multinational corporations like Nike have been accused of exploiting low cost labour and have faced public pressure to introduce better working conditions and a minimum wage (Nisen, 2013). Businesses cannot ignore the impact that NGOs, civil society and social media can effect. Instead of being reactive, businesses should anticipate any aspects of their operations that may

infringe on human rights and proactively work towards avoidance of such violations.

In line with the principles outlined by the United Nations Global Compact (www.unglobalcompact.org) and the International Labour Organization (www.ilo.org), IRDA fully supports international standards for human rights, enshrined in the charter of Ministry of Human Resources (www.mohr.gov.my).

International labour standards are aimed at promoting opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and dignity. In today's globalized economy, international labour standards are essential components in the international framework for ensuring that the growth of the global economy provides benefits to all.

Malaysia too believes that everyone is entitled to their inalienable rights to invest, live, work, worship and play with dignity and respect. This is in accordance with IRDA's vision of building a "Strong and Sustainable Metropolis of International Standing".

Outlined below are the UN Global Compact principles for businesses to support and enact within their sphere of influence, applying the following 10 core values in areas of

human rights, labour standards, the environment and anti-corruption.

Human Rights

- Principle 1: Businesses should support and respect the protection of human rights (enshrined in the Malaysian constitution, please refer to http://www1.umn.edu/humanrts/research/malaysia-constitution.pdf);
- Principle 2: ensure that they are not complicit in human rights abuses across their supply chain.

Labour

- Principle 3: Businesses should uphold the freedom of association and recognise the right of employees to collective bargaining;
- Principle 4: remove all forms of forced and compulsory labour;
- Principle 5: abolish the use of child labour; and
- Principle 6: eliminate all forms of discrimination in hiring and employment practices

Environment

- Principle 7: Businesses should adopt a precautionary approach to environmental issues;
- Principle 8: undertake initiatives to incorporate greater environmental stewardship in its operations; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies.

Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

IRDA strongly encourages businesses to consider this important aspect and take an enlightened approach to adopt the framework in everyday business decisions and practices.

Key office holders should come together to formulate a human rights policy for the business to comply with and make it publicly accessible on mediums such as websites or on the annual report. Top management and HR

professionals should take a proactive approach in educating every employee to abide by the values defined in the human rights policy.

4.2. Disclosure Requirements

Sustainability disclosure is the act of communicating organizational performance on financial, environmental, social and governance (ESG) activities. It is practiced by many leading businesses to communicate their ESG progress to stakeholders and lend credibility to their commitments to sustainable development.

Across the globe, more enlightened stakeholders are raising concerns over businesses' non-financial performance and are demanding them to disclose their ESG performance with greater transparency and detail. In certain regions, such sustainability disclosure is a legal requirement. With effect from 31 December 2007, companies listed in Bursa Malaysia are required to include a description of the corporate social responsibility activities or a statement to that effect in their annual reporting (Listing Requirements of Bursa Malaysia Appendix 9C, Part A, Paragraph 29). Bursa Malaysia supports businesses by providing training for companies and offers guidance for sustainability reporting

(Sustainable Stock Exchange Initiative, 2013)

Many businesses are accustomed to file mandatory sustainability disclosures such as annual reports and quarterly 10-Qs or in the form of non-financial reports such as pollutant and emissions reports for those in heavy industries. There are also established voluntary disclosure frameworks such as Global Reporting Initiative and the Carbon Disclosure Project which businesses adopt in their corporate social responsibility or sustainability reports. There is also a trend of companies aligning financial and non-financial information in a single integrated report.

For businesses that are in their nascent stage of reporting their ESG impacts, they can get in touch with IRDA to learn more on disclosure requirements and report information on the basic triple bottom line performance. This ensures that the disclosed information is complete, consistent, useful and reliable.

The business expression, "If you can measure it, you can manage it" holds true. The process of developing a sustainability disclosure unlocks opportunities for a business to gain insights into its operations and supply chain, identify and mitigate risks and uncover potential cost savings and growth. Businesses that regular publish

sustainability disclosures are recognised on established indices such as the Dow Jones Sustainability Index and FTSE4Good. Businesses that disclose ESG performance not only receive tangible and intangible benefits as mentioned, but also pave the way for a greener economy in Iskandar.

To achieve a more sustainable tourism sector, we have identified the following indices that businesses should monitor:

- Initiatives and targets for environmental performance;
- Direct and indirect energy consumption
- Energy saved due to conservation and efficiency improvements;
- Initiatives to reduce indirect energy consumption and reductions achieved;
- Total direct and indirect GHG emissions;
- Initiatives to reduce GHG emissions and reductions achieved;
- Initiatives to mitigate environmental impacts of products and services, and extent of impact

mitigation;

- Initiatives to improve public awareness on climate change issues

Requirements outlined above are based on the Key Performance Indices indicated in the above sections and aligned with the Global Reporting Initiatives indicators.

4.3. Responsible Procurement

Responsible Procurement ensures that business commitment to good corporate responsibility is reflected in how they select and work with suppliers. Responsible businesses encourage other companies that they do business with to meet the standards of ethics, business integrity and environmental practice expected of them. This would include adherence to high standards on Health & Safety, Fair Business Practices, Environmental Protection, Human Rights, and Local Community Development.

Businesses need to develop a model to bring about meaningful change within the supply chain by way of identifying gaps in the suppliers' ethical business practices, and collaborating with them to develop tangible improvements.

Internationally, leading countries have also embarked on sustainable procurement guidelines across their ministries to ensure that labour rights and environmental concerns are respected. Recognizing the importance of Government Green Procurement (GGP), the Malaysian government has taken initial steps to boost demand for green products and services.

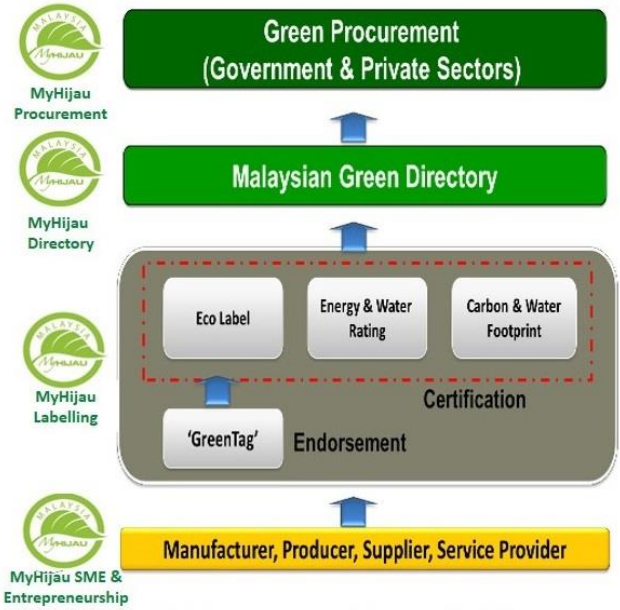

Figure 8: Malaysia Government Green Procurement (Greentech Malaysia, 2013)

As the long-term action plan laid out for Malaysia intends for GGP to be implemented at all levels of government by 2020, this sets an exemplary model for private sector companies to follow suit and enjoy potential business opportunities.

Common products which companies and organizations have adopted green procurement policies for include recycled paper, renewable energy sources, VOC-free

paints and adhesives, etc. Businesses can also cascade their procurement policy to suppliers/contractors to achieve a widespread effect of green procurement.

Leading firms are conducting life-cycle assessments to identify materials in their products that may pose significant environmental, health and safety risks. With this information, firms can re-design their products to prevent or mitigate such risks, which forms a logical part of effective supply chain management practices. Companies operating in Iskandar Malaysia could strive to have at least 10% of their purchases in the initial years, and move towards 100% green procurement in the years to come.

A series of case studies that describe how organizations from different countries have approached the verification of social criteria at various stages of the tender process is available at this link: http://www.sustainable-procurement.org/resources/tools-and-guidance/. Each study looks into how the compliance of direct suppliers is monitored and how this applies to the rest of the supply chain. Procurement professionals and other key stakeholders could learn from the experiences of their counterparts to develop or improve their systems.

Another similar report that provides an overview of

responsible procurement in the private sector globally is the *Green Purchasing: The New Growth Frontier* by the International Green Purchasing Network (http://www.igpn.org/DL/Green_Purchasing_The_New_Growth_Frontier.pdf).

The ideas generated and lessons learnt from these cases can provide additional incentives, goals, and tools for other companies to further advance their environmental purchasing policies.

5. Conclusion

With the development of international theme parks such as Legoland Malaysia and Sanrio Hello Kitty Town, upscale shopping complexes such as Johor Premium Outlets, and the education hub EduCity shared by eight international universities, Iskandar Malaysia is envisioned to be a key growth area poised to boost the region's economic growth and the tourism industry as a whole. As Malaysia ushers in the *Malaysia Year of Festivals 2015* and expects 7 million tourists in the Iskandar region alone, the importance of sustainable development in the tourism industry is paramount.

This guideline provides several key recommendations for green opportunities in (1) accommodation, (2) waste management, and (3) transport. It is important for stakeholders and businesses to understand that the actions outlined not only mitigate environmental impacts, but also meet the economic bottom line with cost savings through increased energy, water, or operational efficiency. With tourists increasingly making informed, environmentally-conscious choices in their hotels and transport, we believe that green tourism will put businesses ahead of their peers.

Useful Links

Bursa Malaysia regulations on sustainability disclosures
http://www.bursamalaysia.com/misc/system/assets/5949/regulation_rules_main_market_bm_mainchapter9.pdf

Green Building Index
www.greenbuildingindex.org

Iskandar Regional Development Authority
www.irda.com.my

Low Carbon Cities Framework and Assessment
http://esci-ksp.org/wp/wp-content/uploads/2012/04/Low-Carbon-Cities-Framework-and-Assessment-System.pdf

Low Carbon Society Blueprint
http://2050.nies.go.jp/cop/cop18/SPM_LCS%20Blueprint_Iskandar%20Malaysia.pdf

Ministry of Energy, Green Technology and Water
www.kettha.gov.my

The 2015 Budget Speech
http://www.thestar.com.my/News/Nation/2014/10/10/Budget-2015-full-speech-text/

Key Industry Contacts

Department of Environment (DoE)
www.doe.gov.my

Ministry of Energy, Green Technology and Water (KeTTHA)
www.kettha.gov.my

Land Public Transport Commission (LPTC)
www.lptc.gov.my

Malaysian Industrial Development Authority (MIDA)
www.mida.gov.my

Ministry of Transport (MOT) Ministry of International Trade and Industry (MITI)
www.miti.gov.my

Ministry or Transport (MOT)
www.mot.gov.my

Ministry of Natural Resources and Environment (NRE)
www.nre.gov.my

Bibliography

(n.d.).

Al Masah Capital Management Limited. (2013). *Al Masah Capital Management Limited*. Retrieved July 8, 2014, from http://almasahcapital.com/uploads/report/pdf/report_90.pdf

Alaska Air Group. (2012). *Alaska Air Group Sustainability Report*. Retrieved July 7, 2014, from http://www.alaskaair.com/~/media/Files/PDF/CSR/AAG_CSR_2012.pdf

BBC. (2011). Low Energy Lighting Guide for TV Production. BBC, ARUP.

Bernama. (2010, August 3). *Dijaya Corp Plans RM3.8 Billion Development In Danga Bay*. Retrieved July 11, 2014, from Iskandar Malaysia: http://www.iskandarmalaysia.com.my/news/100803/dijaya-corp-plans-rm38-billion-development-in-danga-bay

Bersin, J. (2013, December 19). *Forbes*. Retrieved August 28, 2014, from http://www.forbes.com/sites/joshbersin/2013/12/19/ten-predictions-for-talent-leadership-and-hr-technology-in-2014/

Borneo Post. (2014, January 22). *DRB-Hicom revs up to produce energy efficient vehicles*. Retrieved from http://www.theborneopost.com/2014/01/22/drb-hicom-revs-up-to-produce-energy-efficient-vehicles/

Brambley, M. (2005). Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways. prepared for the U.S. Department of Energy by Pacific Northwest National Laboratory.

BSEEP. (2013). *Building Energy Efficiency Technical*

Guideline for Passive Design (1st ed.). Kuala Lumpur: Building Sector Energy Efficiency Project (BSEEP).

Budget 2015: Full text of Najib's speech. (2015, February 25). Retrieved from The Star Online: http://www.thestar.com.my/News/Nation/2014/10/10/Budget-2015-full-speech-text/

Car Advice. (n.d.). *Proton GEN.2 Hybrid - Photos (1 of 4)*. Retrieved from http://www.caradvice.com.au/2170/proton-gen2-hybrid/photos/

Carbon Trust. (2002). Good Practice Guide 319: Managing energy in warehouses. HMSO.

Carbon Trust. (2007). Energy Efficiency – Best Practice Programme (EEBPP) – Technology Overview – Lighting – Bright Ideas for . Carbon Trust.

CarbonTrust. (2002). Good Practice Guide 319: Managing energy in warehouses. HMSO.

Carr Manor. (2014). *Carr Manor Goes Green*. Retrieved July 7, 2014 , from http://www.carrmanor.com/green.htm

D'Souza, C. (2014). *Food waste disposers can mitigate climate change and reduce costs*. Retrieved July 7, 2014, from Waste Wise: http://wastewise.be/2014/05/food-waste-disposers-can-mitigate-climate-change-and-reduce-waste-management-costs/

Energy Saving Trust. (2011). *A Guide to Telematics*. Retrieved July 7, 2014, from http://www.is4profit.com/pdf/a-guide-to-telematics.pdf

Enterprise Holdings. (2013). *The Business of Sustainability*. Retrieved July 7, 2014, from http://www.enterpriseholdings.com/siteAssets/EHI_Sustainability_Report_2013.pdf

Enterprise Holdings. (2014). *Corporate Sustainability |*

Driving Futures - Most Fuel Efficient Fleet. Retrieved July 7, 2014, from http://www.drivingfutures.com/technology-vehicles/most-fuel-efficient-fleet/

EY. (n.d.).

EY. (2013, November 5). Take 5: Budget 2014 Malaysia. Malaysia.

Figueroa, A. (2014, August 25). *What is MICE Travel?* Retrieved from about money: http://tourism.about.com/od/specialtourism/g/What-Does-The-Term-Mice-Mean-In-The-Context-Of-Travel.htm

Film London. (2009). Green Screen. Film London.

Frangipani Langkawi. (2014). *The Frangipani Langkawi Resort & Spa: The Greenest Resort in Malaysia*. Retrieved from http://frangipanilangkawi.com/

Gagnier, S. (2014, April 3). *Average fuel economy of new U.S. vehicles rises to 25.4 mpg*. Retrieved July 7, 2014, from Automotive News: http://www.autonews.com/article/20140403/OEM05/140409928/average-fuel-economy-of-new-u.s.-vehicles-rises-to-25.4-mpg/

GeSI. (2008). *Smart 2020*.

Gilbert, A., & Reece, G. (2006). Developing a carbon budget in the UK with opportunities for EU action. *EcoFYS UK*.

Global Industry Analysts. (2011, January 20). *Global Car Rental Revenues to Exceed US$53 Billion in 2015, According to New Report by Global Industry Analysts, Inc*. Retrieved July 10, 2014, from PRWeb: http://www.prweb.com/releases/car_rental/airport_car_rental/prweb8075794.htm

Global Soap Project. (2014). *Global Soap Project - Our Work*. Retrieved July 7, 2014, from

http://www.globalsoap.org/our-work/

Green Roofs & Walls. (n.d.).

GreenTech Facilities. (2014). *Green Buildings in Malaysia - Commercial*. Retrieved from http://www.greentechfacilities.com/2013/09/green-buildings-malaysia/

Greentech Malaysia. (2013). *Government Green Procurement in Malaysia*. Retrieved September 1, 2014, from http://www.greentechmalaysia.my/content.asp?cmscategoryid=397&zoneid=2#.VARHbPmSwYo

Hertz. (2012). *Living Journey Sustainability Report*. Retrieved July 7, 2014, from http://www.abouthertz.com/pdf/Hertz-Sustainability-Report-2012.pdf

Hilton Worldwide. (2013). *Corporate Sustainability Report 2012-2013*. Retrieved July 7, 2014, from http://cr.hiltonworldwide.com/_pdf/Hilton_2012CRR_PDF_v22.0.pdf

Inbound Logistics. (2009). *Good Things Come From Green Packages*. Retrieved 06 10, 2014, from http://www.inboundlogistics.com/cms/article/good-things-come-from-green-packages/

InterContinental Hotels Group. (2014). *Corporate Responsibiltiy Report*. Retrieved July 7, 2014, from http://www.ihgplc.com/files/pdf/2013_cr_report.pdf

International Tourism Partnership. (n.d.). *Minimum standards towards a sustainable hotel.* Retrieved July 7, 2014, from http://www.ihei.org/images/content/downloads/pdf/going%20green%20english%202014.pdf

IRDA. (2014, February 28). *5th High Level Seminar on Environmentally Sustainable Cities.* Retrieved July 8,

2014, from http://www.hls-esc.org/documents/5hlsesc/Iskandar.pdf

Iskandar Malaysia Development Authority. (2011). *Invest tourism Iskandar Malaysia: Asia's Dynamic Tourism and Leisure Destination*.

Iskandar Regional Development Authority (IRDA). (2014, April 25). ISKANDAR MALAYSIA revival of tourism industry.

Iskandar Regional Development Authority. (2014, February 28). *5th High Level Seminar on Environmentally Sustainable Cities*. Retrieved July 8, 2014, from http://www.hls-esc.org/documents/5hlsesc/Iskandar.pdf

Lawrence, T., & Perry, J. (2010). Capturing Condensate. *High Performing Buildings*, pp. 56-61.

Low, M. L., & Kasmuri, A. (2014, November 30). *IM Biz Watch*. Retrieved August 22, 2014, from Iskandar Malaysia: http://www.iskandarmalaysia.com.my/sites/default/files/IM%20BizWatch%20July%202014.pdf

Malaysia Green Technology Corporation. (2013). *MyHIJAU Mark*. Retrieved August 26, 2014, from http://www.greentechmalaysia.my/content.asp?zoneid=28&articleid=220#.U_xhGfmSwYo

Malaysia Tourism. (n.d.). *Tourist Facts & Figures*. Retrieved July 7, 2014, from http://corporate.tourism.gov.my/research.asp?page=facts_figures

Marriott International. (2013). *2013 Sustainability Report Update*. Retrieved July 7, 2014, from http://www.marriott.com/Multimedia/PDF/CorporateResponsibility/Marriott_Sustainability_Report_Update_2013.pdf

MCI Sustainability Services. (2014, August 25).

Sustainability Guidelines for the Singapore MICE Industry. Retrieved from Singapore Tourism Board: http://www.yoursingapore.com/content/dam/mice/en/whysingapore/PDF/STB_sustainability_guidelines_manual_november_2013.pdf

Monash University Malaysia. (2014). *Quest to Solve Water Scarcity*. Retrieved August 15, 2014, from http://www.monash.edu.my/news/researchers-say/quest-to-solve-water-scarce

Murray. (2014). *Packaging In The Warehous*. Retrieved 06 10, 2014, from http://logistics.about.com/od/operationalsupplychain/a/Packaging-In-The-Warehouse.htm

National Climate Change Secretariat . (2013). *Harmony with the Environment: Siloso Beach Resort*.

Nisen, M. (2013, May 9). *Business Insider*. Retrieved August 28, 2014, from http://www.businessinsider.com/how-nike-solved-its-sweatshop-problem-2013-5?IR=T&

Qantas. (2014, July 8). *Fly Carbon Neutral: Program Overview*. Retrieved from http://www.qantas.com.au/travel/airlines/fly-carbon-neutral/global/en

Rabindra. (2004). Use of Earth Air Tunnel HVAC system in minimizing indoor air pollution; Air Quality Monitoring and Management. proceedings of Better Air Quality 2004.

Ron, U. (2014, April). *Greenroad: Press Releases*. Retrieved from Greenroad: http://greenroad.com/press-releases/

Saka, A. A., & Agboh, D. K. (2002). *Assessment of the Impact of Electronic Toll Collection on Mobile Emissions in the Baltimore Metropolitan Area*. Baltimore: National Transportation Center.

Siloso Beach Resort. (2013). *Siloso Beach Resort Sustainability Report*.

Siloso Beach Resort. (2014). Retrieved from Siloso Beach Resort, Sentosa; Blending life & leisure with nature: http://silosobeachresort.com/

Sustainable Energy Authority of Ireland. (2014, July 13). *Building Energy Management Systems (BEMS)*. Retrieved from http://www.seai.ie/Your_Business/Technology/Buildings/Building_Energy_Management_Systems_BEMS_.html

Sustainable Stock Exchange Initiative. (2013). *Bursa Malaysia (Malaysian Exchange)*. Retrieved August 26, 2014, from http://www.sseinitiative.org/fact-sheet/bursa/

Sydney Morning Herald. (2014, July 29). *Qantas, Virgin in sights of ACCC*. Retrieved from http://www.smh.com.au/business/aviation/qantas-virgin-in-sights-of-accc-20140729-zxzci.html

T5 Lighting USA. (2014). *Benefits*. Retrieved 06 10, 2014, from http://t5lightingusa.com/t5-lighting-benefits/

Tufts University. (2014). *Bulb Exchange*.

UNEP & UNWTO. (2008). *Climate Change and Tourism: Responding to Global Challenges*.

United Airlines. (2014). *Fuel efficiency highlights*. Retrieved July 7, 2014, from http://crreport.united.com/environment/fuel-efficiency-highlights

Universiti Utara Malaysia. (2014). *Universiti Utara Malaysia*. Retrieved August 27, 2014, from http://www.hiccob.uum.edu.my/

University of Twente, Unilever. (2013). Sustainable Warehousing. University of Twente, Unilever.

UNWTO. (2007, October). *Tourism & Climate Chang:*

Confronting the Common Challenges. Retrieved July 11, 2014, from UNWTO: http://sdt.unwto.org/sites/all/files/docpdf/docuconfrontinge.pdf

UNWTO. (2013). *UNWTO Tourism Highlights*.

UNWTO. (n.d.). *Understanding Tourism: Glossary*. Retrieved July 10, 2014, from United Nations World Tourism Organization: United Nations World Tourism Organization

US Department of Energy. (2014). *LED Lighting*. Retrieved July 13, 2014, from http://energy.gov/energysaver/articles/led-lighting

US EPA. (2009, August). *A Guide to Energy-Efficient Heating and Cooling*. Retrieved July 13, 2014, from http://www.energystar.gov/ia/partners/publications/pubdocs/HeatingCoolingGuide%20FINAL_9-4-09.pdf?7abc-7028

WEF. (2009). Supply Chain Decarbonization. World Economic Forum.

Wikipedia. (n.d.). *Electronic Road Pricing*. Retrieved from http://en.wikipedia.org/wiki/Electronic_Road_Pricing

World Travel & Tourism Council. (2013, October). Economic Impact of Travel & Tourism Mid-Year Update. London, United Kingdom.

XinHua News. (2009). *Solar power plants to spring up in China* . Beijing.

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About IRDA
The Iskandar Regional Development Authority (IRDA) is a Malaysian Federal Government statutory body tasked with the objective of regulating and driving various stakeholders in both public and private sector towards realizing the vision of developing Iskandar Malaysia into a strong and sustainable metropolis of international standing

The Division provides strategic advice on environmental planning, development and management, carries out research and works in partnership with external agencies to promote a green growth economy for Iskandar Malaysia. In addition, the Division builds capacity, collaborates to integrate Climate Change programmes, statutory requirements related to the environment and supports green growth aligned to national commitments.

For further details, please contact the Head of Environment Division, IRDA.

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ISKANDAR REGIONAL DEVELOPMENT AUTHORITY

ISKANDAR
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