



Green Economy Guideline Manual

2014



Healthcare





MEET ISKANDAR MALAYSIA

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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 de 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 reaffirmed its commitment to sustainable development, and its voluntary reduction commitment (announced at the 15th 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.

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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 **healthcare industry**.

We hope businesses in Iskandar in the healthcare 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

AFV	Alternative Fuelled Vehicles
BEMS	Building energy management system
CFL	Compact Fluorescent Lighting
ESG	Environmental, social and governance
ETP	Economic Transformation Programme
FSC	Forest Stewardship Council
GBI	Green Building Index
GGP	Government Green Procurement
GHG	Greenhouse gases
HEPA	High Efficiency Particulate Air
HRV	Heat Recovery Ventilation
HVAC	Heating, ventilation and air-conditioning
IAQ	indoor air quality
ICT	Information and communications technology
IM	Iskandar Malaysia
IRDA	Iskandar Regional Development Authority
ISIC	United Nations International Standard Industrial Classification
IWC	Integrated Wellness Capital
KeTTHA	Malaysia Ministry of Energy, Green Technology and Water
LED	Light-emitting diode
LEED	Leadership in Energy and Environmental Design
LEP	Light-emitting plasma
MATR	Malaysia Automotive Technology Roadmap
NAP	National Automotive Policy
OECD	Organization for Economic Cooperation

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PVC	Polyvinyl chloride
RMW	Regulated Medical Waste
VOC	Volatile organic compounds
WHO	World Health Organization

Healthcare Industry

1. Sector Overview

The healthcare industry is typically divided into several areas. As a basic framework for defining the sector, the United Nations International Standard Industrial Classification (ISIC) categorizes the healthcare industry as generally consisting of:

- hospital activities,
- medical and dental practice activities, and
- other human health activities involving the nurses, midwives, physiotherapists, scientific or diagnostic laboratories, pathology clinics, residential health facilities, or other allied health professions (United Nations, 2008).

The sector plays a vital role in the global economy, with healthcare expenditures accounting for 10.2% of global GDP in 2012 (World Bank, 2014). In Malaysia, the domestic healthcare market was valued at RM7.1 billion in 2012 and is estimated to grow to RM11.6 billion within six years' time (The Borneo Post, 2013).

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The Malaysian healthcare system is divided into public (70%) and the private (30%) sectors. Under the Economic Transformation Programme (ETP) launched in 2011, the Malaysian healthcare sector is set to be turned into a private sector-driven engine for economic growth. With the health spending by member countries of the Organization for Economic Cooperation (OECD) forecasted to triple to RM31 trillion by 2020 and Asia Pacific market contributing 27% of the global market, Iskandar Malaysia (IM) aims to exploit its strategic location and be the regional healthcare destination of choice (Iskandar Regional Development Authority, 2011).

Accordingly, healthcare investments have poured into the region too. As of end of June 2014, the Iskandar Regional Development Authority (IRDA) has received RM2.59 billion of committed investment from investors. As for the realization in IM, a 210-acre Medini Integrated Wellness Capital (IWC) has begun construction in 2013. A wellness sanctuary forms the focal point of the development, which would target residents who are seeking a resort lifestyle all year round away from the hustle and bustle of city life. In addition, large-scale medical facilities such as the 300-bed Gleneagles Medini Hospital integrated with a 150-suite medical office block are expected to be opened by

2015.

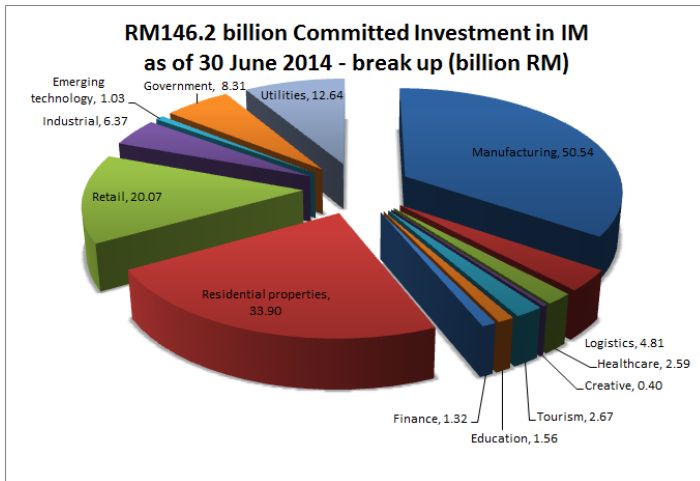


Figure 1: Cumulative committed investment in IM (Low & Kasmuri, 2014)

1.1 Environmental Impact

The healthcare industry's greenhouse gases (GHG) emission comes largely from energy use in sophisticated healthcare facilities and the procurement of goods, equipment and materials. A study by the World Health Organization (WHO) indicates that the U.S. healthcare industry accounted for around 8% of the nation's total emissions (World Health Organization, 2009).

2. Identifying Green Opportunities

2.1 Areas of Intervention

2.1.1. Facility Efficiency

As hospitals have to serve their patients at all times, they have to constantly maintain the operation of lighting and heating, ventilation and air-conditioning (HVAC) systems.

Consumption patterns of hospitals may vary according to various factors, such as location, size, or type of equipment used. According to data from the Carbon Trust, more than half of energy consumption in hospitals is usually used for heating of air, space, and water (Figure 1). According to a US study, hospitals are among the most energy intensive facilities having more than 2.5 times the energy intensity of commercial buildings of similar size (US Department of Energy, 2009). With simple energy conservation measures in place, hospitals can save up to 30% on heating energy (Carbon Trust, 2010).

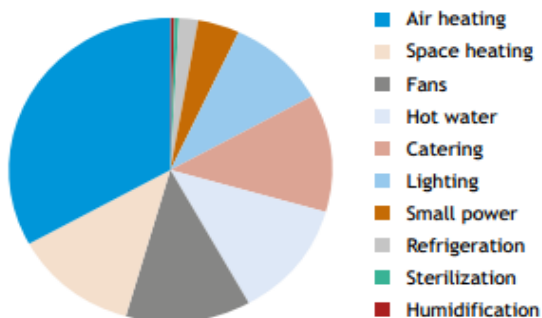


Figure 2: Energy consumption in hospitals (Carbon Trust, 2010)

2.1.2. Waste Management

As shown in Figure 2, around 20% to 25% of hospital waste requires special treatment. The appropriate handling and disposal of clinical wastes generated from hospitals and other health care institutions and facilities is essential in order to mitigate adverse health and environmental consequences. It is estimated that 30% of the mercury in the environment comes from medical incinerators. Hence, the immediate and long-term environmental health problems caused by improper management of clinical wastes are harmful to both public health and the environment.

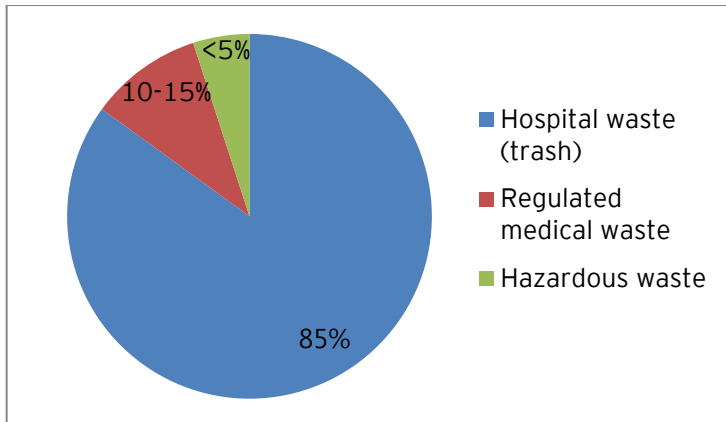


Figure 3: Types of healthcare waste (Sustainability Roadmap for Hospitals, 2014)

In addition, hospitals use a significant amount of packaging to ensure that food, water, and medical equipment are kept clean and sterilized. Hence, reducing or recycling such packaging would contribute significantly to savings in material costs.

2.1.3. Transportation and Logistics

Every day, many medical items - including laboratory specimens, pharmaceuticals, patient records and other medically critical and administrative materials - are transported to healthcare facilities. On the other hand, ambulances are often idling and still consuming fuel while waiting for the next patient transport.

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Hence, transportation in the healthcare industry has the potential for cost savings and is also strategic to the overall mission of patient care and safety.

2.2. Potential Options

Following the analysis on key areas for intervention, the guideline suggests the following measures can be taken in order to minimize environmental impacts from the sector.

Potential options for each sub sectors

Areas for Intervention	Aspects
Facility Efficiency	<ol style="list-style-type: none">1. HVAC efficiency2. Lighting efficiency3. Measurement of environment indicators
Waste Management	<ol style="list-style-type: none">4. Hazardous waste5. Conventional waste
Transportation and Logistics	<ol style="list-style-type: none">6. Alternative fuels7. Fuel efficiency

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 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 Carbon Trust, a 1°C decrease in internal building temperature results in 10% energy consumption savings which would automatically lead to decrease in GHG emissions (CarbonTrust, 2002). 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

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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

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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.

Action: Promoting efficient ventilation through technology

Hospitals need to pay special attention to the air quality inside the building. For example, to prevent airborne infections, hospitals need to install 99.7% High Efficiency

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Particulate Air (HEPA) filtration in the ventilation system. In addition, certain rooms such as operating rooms, emergency rooms, intensive care units, or laboratories require high indoor air quality (IAQ) levels. IAQ concerns the purity, temperature, and humidity of the air. Hence, hospital rooms often require heating, cooling, and 20 to 30 air changes per hour (Schneider Electric, 2006).

In a case study in England, Freeman Hospital in Newcastle built modern theatre suites with ventilation systems that automatically switched off when not in use. Compared to the previous system that operated at all times in a full or standby mode, the new system allowed the hospital to save the equivalent of RM92,000 per year. The new suite had a building energy management system (BEMS) along with passive infrared detectors, which made ventilation and heating significantly more energy efficient.

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):

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- 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

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too little refrigerant charge can damage the compressor, reducing the shelf life and increasing costs.

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

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Action: Wall Insulation

Malaysia has a mild climate with outdoor dry bulb temperatures reaching 26.9°C during day time and 24°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*

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Guideline for Passive Design (2013) suggests that provision of 25mm of insulation provided maximum incremental savings. Keeping in mind that electricity tariffs in Malaysia are bound to increase with time, businesses 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

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energy requirements. Sealing cracks in walls, window panes, controlling window/door operation with sensors, door pumps, and 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: Daylight harvesting

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

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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 daylight penetration, uniform daylight distribution, etc., needs to be investigated thoroughly, and addressed before implementation of a well-designed daylight 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 diode (LED) and fluorescent lighting as the most energy-efficient sources without compromising on performance (BBC, 2011).

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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).

A cheaper alternative, high efficiency Compact Fluorescent Lighting (CFL) consumes only 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 where incandescent lights are used, and are particularly suitable for area lighting.

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Figure 3: Comparison of Lighting Types

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

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

During its refurbishment, St. Charles' Hospital in London installed a microprocessor controlled lighting system in the main corridors. During the day, the sensor detects the natural daylight and adjusts the light level; and during the nighttime, the sensor detects the presence and controls the lights accordingly. With the similar amount of investment needed for the traditional lighting system, St. Charles installed a more efficient lighting system with sensors and was able to save GBP1,200 annually (Carbon Trust, 2010).

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 comforts, brightness control, glare protection, privacy, view out, and durability are the key factors that need to be considered before the

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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.

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.

IM 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.

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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 the **Ministry of Energy, Green Technology**

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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.

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IM aims to be an internationally recognized sustainable metropolis, and has imposed a building rating system alongside GBI for their new developments to identify and monitor building sustainability. Businesses should refer to **IRDA's 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 (Iskandar Regional Development Authority, 2014):

- An adjustment to tax rate on fixed asset tax
- Tax incentives on green development
- Low interest loans for energy-efficient buildings
- Subsidy for adopting photovoltaic power

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

3.2. Waste

3.2.1 Hazardous Waste

Regulated Medical Waste (RMW) is an occupational hazard in the healthcare industry. It is generally classified into the following categories:

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- a. Pathological waste: Consists of tissue, organ, body parts, blood, and body fluid.
- b. Infectious waste: Consists of waste material that contains pathogens in sufficient concentration or quantity that could cause diseases.
- c. Chemical waste: Consists of chemical substances such as laboratory reagents, film developer, disinfectants, and solvents.
- d. Radioactive waste: Consists of solid, liquid, and gaseous waste that is contaminated with radionuclides generated from medical operations

In Malaysia, medical waste is regulated under the Environmental Quality (Scheduled Wastes) Regulations, 2005. A digital copy of the regulations can be found here: [http://cp.doe.gov.my/cpvc/wp-content/uploads/2011/04/Regulations/Environmental%20Quality%20\(Scheduled%20Wastes\)%203.pdf](http://cp.doe.gov.my/cpvc/wp-content/uploads/2011/04/Regulations/Environmental%20Quality%20(Scheduled%20Wastes)%203.pdf) (Department of Environment, 2005).

Action: Implement an effective waste management plan

An effective waste management plan requires a strategy that will facilitate careful implementation of the necessary

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measures. It should be structured in terms of the various stages: (1) collection (2) handling, (3) treatment and (4) disposal.

Steps that can be taken to implement such a plan include:

- a) Analyze RMW collection, handling, treatment, and disposal streams and identify current/ possible problems
- b) Create a team and assign clear responsibilities, which should include specific goals and an action plan
- c) Educate and train employees on appropriate RMW procedures
- d) Monitor and review results and implement changes where necessary

Hospitals must also be in compliance with federal regulations when reviewing their facility's procedures and regulations. To ensure compliance with the national Environmental Quality (Scheduled Wastes) Regulations, hospitals and medical waste management companies may refer to the guidelines written by the Malaysian Department of Environment found here: <http://www.doe.gov.my/webportal/wp->

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[content/uploads/2010/07/anagerment_Of_Clinical_Wastes_In_Malaysia_2_0.pdf](#) (Department of Environment, 2009).

In addition, the waste management plan should also consider enhancing the knowledge of key stakeholders through the effective dissemination of technical information and research on the environmental impacts of medical waste.

Action: Inspect red bag waste

One of the most effective ways for sustainable healthcare waste management is to inspect red bag waste. A large amount of non-infectious waste is misplaced in the infectious waste stream,



which results in unnecessary disposal costs to hospitals. In a case study in Thomas Jefferson University Hospital, it was found that 80% of red bag waste was misplaced (The Health Care Improvement Foundation, 2014).

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By removing red bags from most of the rooms, with exceptions for labor and emergency rooms, hospitals were able to reduce the amount of regulated medical waste.

Thomas Jefferson University Hospital reduced its infectious waste by 63% by removing all the red step-on cans from patient rooms and educating employees on infectious medical waste. The Lower Bucks Hospital removed red bags from most of the patient rooms, medical surgery rooms and all operating rooms, and instead placed smaller red cans in both the Intensive Care Unit and catheterization laboratory. As a result, it reduced waste and cost by around 60 to 70% (The Health Care Improvement Foundation, 2014).

Action: Using alternative disposal methods

Incineration and alternatives like autoclaving, which treats infectious wastes by applying a combination of heat and pressure, require a high consumption of fossil fuels to operate. In 2013, an alternative MIMO medical waste treatment system has been developed to handle infectious waste and pharmaceutical waste.

The MIMO system uses a combination of physical and chemical processes to treat medical waste and destroy any undesirable material such as pathogenic microorganisms.

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Instead of fossil fuels, the MIMO system only runs on electricity. The system uses mechanical elements and chemical reagents that are easily available in any country and can be managed by operators trained in the local country.

It costs 75% less to build a MIMO system plant than a hazardous waste incinerator and the operating cost is 50% lower. The MIMO system can also process 3000 Kg of hazardous waste per hour, four times the maximum yield of an incinerator. Aside from Spain, it has also been utilized in Turkey and Morocco (Eureka, 2013).

Key Performance Index

Performance Index	Objective	Ease of implementation
Waste management plan in place	Higher	Moderate
Regular inspections of red bag waste	Lower	Easy
Percentage of hazardous waste with proper disposal	Higher	Easy

3.2.2. Conventional Waste

Packaging initiatives aims to reduce the amount of packaging used for each product, remove hazardous materials from the packaging, and make packaging easy to recycle. The actions outlined in this section will comprise of reducing volume, weight and recycling. Packaging in healthcare plays a vital role as all products must not only be protected from shock, vibration, compression, temperature, oxygen, vapor etc., but also be packaged in a sterile manner. Innovating packaging not only can reduce environmental impact but also bring cost reduction from enhancing logistics efficiency though lighter weight and reduced volume.

Action: Light-weighting and reducing volume

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). Reducing weight and volume directly reduces energy used for transport and can lead to direct cost savings from higher load factor (more shipments per container) and lower shipment costs when charged by weight (in case of air freight).

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Action: Using Recyclable packaging material

Paper, aluminum, cardboard and plastics are recyclable packaging materials that reduce waste going to landfills. Developing eco-friendly vinyl packaging materials which are biodegradable can also contribute in reducing landfills.

Packaging measures offers both environmental and direct cost savings. Through research and development initiatives, innovations in packaging must be pursued considering its benefits.

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Percentage of packaging material reduced (by weight or volume)	High	Easy
Percentage of packaging material recycled	Low	Moderate

Efficient packaging measures offer both environmental and direct cost savings. Through research and development initiatives, innovations in packaging must be

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pursued considering its benefits. 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 to improve the life cycle of products and materials. IM plans to revolutionize the logistics industry by providing competitive supply chain management facilities and services for cost-effective and sustainable goods and service distribution. Companies can take advantage of this emphasis on remanufacturing and use Malaysian remanufactured products for their packaging needs.

3.3. Transportation and Logistics

3.3.1 Increasing Utilization of Alternative Fuelled Vehicles (AFV)

AFV refers to an increasing number of vehicles which run on fuels other than petrol or diesel. This category includes vehicles which run on less-emissions-intensive or renewable fuels, and comprises a number of technologies at varying stages of commercialization (Table 1). Increasing the utilization of AFVs can mitigate GHG

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emissions and result in fuel cost savings.

AFV Type	Innovation Type	Current Status	Barriers
LPG, LNG, CNG ¹		Mass production	Infrastructure
Hybrid Vehicles ²	Incremental	Mass production	Cost of battery
2 nd Gen Biofuels ³	Incremental	Demonstration	Technology Fuel supply
Electric Vehicles	Radical	Pre-commercial	Range Infrastructure
Hydrogen Fuel Cell Vehicles	Radical	Research / Pre-commercial	Vehicle cost Infrastructure

Table 1: Market maturity of different types of AFV (Intelligent Energy Europe, 2010)

Two types of AFV's in common usage: gas-based systems (LNG/LPG/CNG) and hybrid vehicles. These types of

¹ LPG: liquefied petroleum gas; LNG: liquefied natural gas; CNG: compressed natural gas

² Hybrid vehicles use a combination of an internal combustion engine, electric motor and electricity storage to power the vehicle. A range of configurations are currently produced.

³ 2nd generation biofuels are those that utilise the cellulose and lignin in plants, rather than sugars

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vehicles leverage existing technologies and infrastructure, and (particularly for gas-based vehicles) have an extensive history of development. Second generation biofuels represent an alternative fuel, rather than vehicle type, which would integrate easily with existing vehicles and infrastructure; however, the technology to efficiently produce second-generation biofuels remains in development. Electric and hydrogen fuel cell vehicles represent a significant departure from existing vehicle technologies, and are being rapidly commercialized. Cost, range and infrastructure currently limits uptake; however, companies should monitor progress in these areas as the technologies are under further development to maximize fleet efficiency.

Consideration should also be given to the specific transportation requirements (task characteristics, range of travel) and regional infrastructure (availability of refueling infrastructure) when determining the viability of AFV's. The healthcare sector should evaluate different fuel/technology options available and choose the most appropriate option for their operations.

Action: Increasing CNG vehicle utilization

One alternative fuel option that is already in practice in

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the healthcare industry is CNG. In April 2013, the North Shore-LIJ Health System in New York commenced operations of a new cleaner, greener and quieter ambulance powered by CNG and built to the health system's specifications. It is the first ambulance of its kind operating in the US.

Alternative fuel is a cost-effective option. Running on natural gas is more than RM6 cheaper per gallon than diesel or gasoline prices. The CNG-ambulance, which runs 60 hours a week, would see about an annual fuel savings over RM19,000 (North Shore-LIJ, 2013).

Key Performance Index

Key Performance Index	Objective	Ease of Implementation
CO ₂ emissions / distance travelled (CO ₂ / t / km)	Lower	Moderate
Proportion of AFV / hybrid in fleet	Higher	Easy
Average distance covered by AFV / hybrid vehicles	Higher	Easy
Utilization rate of AFVs	Higher	Easy

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This section on increasing utilization of AFVs and technological improvements in the vehicles provide a significant opportunity. However, external factors, including technological maturity, barriers to implementation and government support and regulation, should be carefully assessed before adoption, especially in the case of AFVs.

At the federal level, Malaysia has introduced incentives in its National Automotive Policy (NAP) to increase the use of hybrid and electric vehicles, such as tax exemptions for AFV and development of infrastructure to support a green-fuelled automotive industry. This forms part of the Malaysia Automotive Technology Roadmap (MATR), an action plan to meet the objectives of NAP 2014 by supporting industries and businesses with renewable energy technological investment and adoption.

IM also plans to support MATR by promoting renewable energy-fuelled transportation within its region. These incentives for Malaysia's hybrid and electric vehicles extend to the IM region and allow better management of the sustainability of fleet operations within IM. Businesses and stakeholders should use these action plans as a guideline to reducing carbon emissions from transportation, thus working towards achieving IM's and

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Malaysia's green transportation goals.

3.3.2 Fuel Efficiency

Action: Utilizing anti-idling technology

In hospitals, ambulances often idle outside the Emergency Department in order to keep medical equipment charged and medications at the proper temperature while waiting for the next patient transport. The exhaust from these ambulances contains a variety of toxic components including carbon monoxide and compounds linked to lung disease. Ambulance exhaust can float into the Emergency Department and surrounding areas where patients wait for treatment.

Primarily, an anti-idling system allows the vehicle to maintain the interior temperature and battery charge while saving fuel and reducing emissions. If the interior temperature of the emergency response vehicle goes outside the pre-set values, either too hot or too cold, or if the battery voltage falls below a safe operating level, the engine will start automatically to re-establish these pre-set parameters. Once the interior temperature and/or battery voltage are back within these pre-set limits, the vehicle engine will automatically shut off. The cycle will continue

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as long as the anti-idling system is activated.

While the primary benefit of the anti-idling technology system is fuel savings, there are other benefits from the system as well. By maintaining a consistent temperature in the vehicle, patient comfort is improved, the temperature requirements for medical drugs are maintained, and the vehicle charging system components life is extended.

In Canada, 48 ambulance and emergency response vehicles of the Toronto Emergency Medical Services are equipped with anti-idling technology designed to control and monitor engine idling. In addition, all future front-line vehicles will have this technology installed (City of Toronto, 2013).

More information on anti-idling technology can be found on the London Fleet Operator Recognition Scheme's toolkit here: http://www.fors-online.org.uk/index.php?page=PF_ANTIIDLING. The toolkit includes driver handbook information, case studies, factsheets and posters, a procurement guide, and a fuel reduction savings calculator (Transport for London).

3.4. Water Management

Water availability is increasingly becoming a global issue. The United Nations Environment Program 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 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.

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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.

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.

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

In the healthcare industry, large quantities of water are used for toilet flushing and washing purposes. Low flow fixtures installed on taps and showerheads and high efficiency dual flush toilets reduce water consumption.

Action: Re-using greywater for flushing and irrigation

Greywater systems recycle water by collecting water that

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has been used for one purpose, and then using it for another, thus reducing the amount of fresh water required, and therefore reduces the volume of wastewater produced

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Water intensity	Lower	Easy
Utilization of greywater	Higher	Moderate

3.5. Equipment Usage

Action: Reduce equipment energy use.

With heavy use of IT and electronic equipment, such as computers, monitors, photocopiers, laboratory equipment, reducing energy use in equipment can significantly reduce energy consumption and GHG emissions from buildings. Employees should be encouraged to turn off all electrical devices when not in use or set them to energy-saving / stand-by mode. When purchasing technical equipment, enquire about more efficient ways of usage.

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Action: Install energy-efficient equipment

Energy-efficient equipment contributes significantly to the cost-savings in business operations. As explained above, energy-efficient equipment, such as HVAC equipment and servers, stands to reduce energy consumption to a large extent. This energy savings definitely translates into cost savings for businesses.

However, energy-efficient equipment is not limited to only instruments like HVAC equipment and servers. Significant energy consuming equipment such as escalators, elevators, motors and pumps are also potential areas for cost-savings.

Example of energy-efficient escalator

Hitachi's VX Series escalators have automatic switch-off system that switches itself off when not in use. It also has a load detection system that promptly adjusts its conveyor speed to optimize usage. The combined energy-saving features enable the escalator to register up to 48% in energy savings when compared to conventional escalators (Hitachi, 2014).

There are many ways to identify energy-efficient equipment in the market. One of the easiest ways is to

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look for energy-efficient marker in the equipment, such as the ENERGY STAR tick marks. Energy-saving certifications, such as ENERGY STAR, assure consumers of the energy efficiency of the product. However, consumers should still conduct due diligence on the value proposition and energy savings of equipment before any purchase.

Key Performance Index

Key Performance Index	Objective	Ease of implementation
Energy consumption from equipment use	Lower	Easy
% of equipment with energy saving certifications (e.g. from ENERGY STAR)	Higher	Easy

3.6. Monitoring & Reporting

Action: Development/Adoption of green technologies

The Information and communications technology (ICT) - enabling effect involve 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 7.8G tCO₂e, 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

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monitoring and review compared to an emissions target over a period (Gilbert & Recce, 2006).

Action: Monitoring usage

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 US 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, 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. BEMS provides users with easily available data on energy flows, consumption, trends and overall building performance. Companies such as Siemens even have

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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.

Key Performance Index

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

3.7. 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

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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

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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.

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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

3.8. 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

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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

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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

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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 measureables, such as GHG emissions or energy use, creating better products, services and operations.

3.9. Case Study: Gundersen Health System

Gundersen Health System is an integrated healthcare organization in Wisconsin, USA, whose environmental program, Envision®, has set the standard for sustainability for hospitals worldwide. Envision sets out to demonstrate that going green can be a healthy, socially responsible and economically beneficial strategy. Its specific goals include (Gundersen Health System, 2014):

- Meeting 100% of facility energy needs in 2014
- Partnering with communities to encourage sustainable economic growth and development
- Reduce the cost of care for patients

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Image 1: Gundersen Health Facility, a LEED certified hospital (Gundersen Health System, 2014)

Since 2008, Gundersen has reduced energy consumption by more than 25 percent by performing comprehensive energy audits, implementing a comprehensive energy management plan and retro-commissioning its buildings. These actions have helped Gundersen save over USD1 million a year on its energy bills and they are continuing to invest in renewable energy. Selected examples of Gundersen's environment initiatives will be summarized below (Gundersen Health System, 2014):

a) Exhaust Fans: During an energy audit, Gundersen staff discovered many exhaust fans were unnecessarily running 24/7 in outpatient and office facilities which are only utilized in the day. To reduce energy demand, Gundersen modified the fans by reprogramming the building controls and "scheduling" them to turn off overnight and on the weekends when the facility is unoccupied. Changing just

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eight fans reduced electricity consumption by more than 71,000 kWh and saves USD4,000 per year.

b) Cooling systems: As part of Gundersen's retro-commissioning process, changes were made to the chiller's system programs to optimize cooling tower fan utilization with the chiller compressor. This allows the two components to run at the most efficient setting based on outside conditions such as temperature and humidity. The change reduced electricity consumption for cooling the campus by about 1.1 million kW hours per year, reducing costs by approximately USD65,000 annually.

c) Recycling (during and after construction): During the construction of a new building, Gundersen worked closely with contractors to separate and recycle construction waste. With several dumpsters at the construction site to sort the waste by metal, wood, concrete, cardboard, and other categories, approximately 98% (nearly 18,400 tons) was recycled rather than being sent to the local landfill.

Recycling is also a top priority for existing buildings. Recycling stations are being incorporated into all waiting rooms, and containers will be strategically placed throughout the building to promote recycling for patients, visitors and staff.

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d) Biomass boilers: When it came time to replace their aging boilers, Gundersen selected a biomass boiler. The biomass boiler uses clean organic wood fuel sources, such as milling or forest residues. These woody biomass products are sourced locally and have no paints, glues or treatments on the wood.

In addition, the biomass boiler project incorporates a steam turbine. Steam runs through the turbine and turns a motor to produce electricity. That electricity - equivalent to the consumption of about 225 homes a year - is used on-site by Gundersen, further reducing fossil fuel emissions. In total, the biomass boilers are expected to save Gundersen approximately USD500,000 a year and contribute towards 38% of their energy independence goal, the highest figure of any project.

e) Sustainable building design: During the construction of a new hospital, Gundersen worked with their architects and designers to incorporate a wide array of green elements, such as:

- Eliminating PVC materials from interior finishing, such as flooring, carpeting, upholstery and wall coverings, as much as possible.

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- Using Forest Stewardship Council (FSC)-certified wood throughout the project.
- Using materials with a recycled content, such as ceiling tiles and carpeting, throughout the building when possible.
- Efficient lighting design with lower wattage lamps and high-efficiency ballasts, occupancy sensors, and fixtures that better disperse light.
- A highly insulated building shell (windows, walls, ceilings, etc.)

In addition to all these measures, Gunderson also shares its knowledge and expertise with other leading healthcare systems in the Hospital Energy Alliance.

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

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investment decisions. More than 1260 signatories with USD45 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.

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.

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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.

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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

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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

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

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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

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(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

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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 healthcare 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

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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 Initiative 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 suppliers' ethical business practices, and collaborating with them to develop tangible

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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.

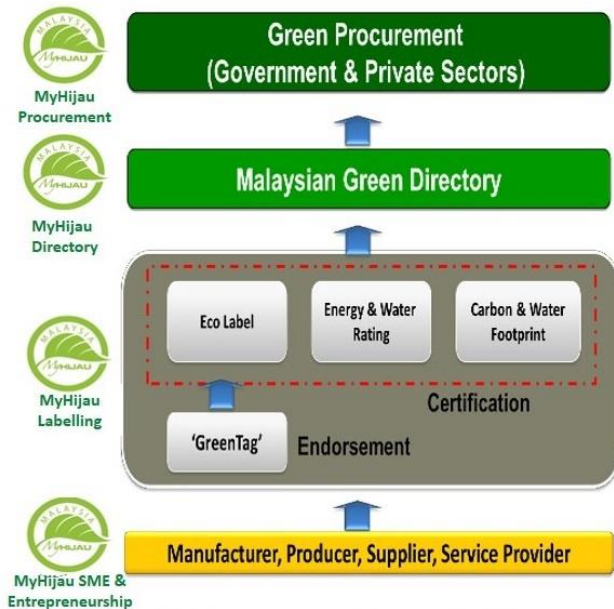


Figure 4: Malaysia Government Green Procurement (Greentech Malaysia, 2013)

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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 IM 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

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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 and tools for other companies to further advance their environmental purchasing policies.

5. Conclusion

The private healthcare landscape in IM is fast transforming to be a vibrant healthcare hub. The region is envisioned to comprise of a variety of hospitals, polyclinics, and specialists' suites complemented by wellness centres that emphasise traditional treatment, creating a truly holistic healthcare environment. With large-scale developments such as the 68-acre Afiat Healthpark, it is important to practice sustainable development in line with IM's Green Economy.

As hospitals operate 24 hours a day, 365 days a year, there is potential for significant improvements to be made through increased efficiency and new initiatives. This guideline provides key recommendations for green opportunities in the field of (1) facility efficiency, (2) waste management, and (3) transport. Through the adoption of some of the best practices highlighted in this guideline, IM is well positioned to achieve its vision of being a regional medical hub of choice.

Useful Links

Bursa Malaysia regulations on sustainability disclosures

http://www.bursamalaysia.com/misc/system/assets/5949/regulation_rules_main_market_bm_mainchapter9.pdf

Environmental Quality (Scheduled Wastes) Regulations 2005

[http://cp.doe.gov.my/cpvc/wp-content/uploads/2011/04/Regulations/Environmental%20Quality%20\(Scheduled%20Wastes\)%203.pdf](http://cp.doe.gov.my/cpvc/wp-content/uploads/2011/04/Regulations/Environmental%20Quality%20(Scheduled%20Wastes)%203.pdf)

EY Publication on Budget 2014 Malaysia

[http://www.ey.com/Publication/vwLUAssets/EY_Take_5_-_3rd_edition/\\$FILE/EY-take-5-msia-edition-3.pdf](http://www.ey.com/Publication/vwLUAssets/EY_Take_5_-_3rd_edition/$FILE/EY-take-5-msia-edition-3.pdf)

Green Building Index

www.greenbuildingindex.org

Iskandar Regional Development Authority

www.irda.com.my

London Fleet Operator Recognition Scheme toolkit

http://www.fors-online.org.uk/index.php?page=PF_ANTIIDLING

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

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[ar%20Malaysia.pdf](#)

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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.

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