Green Practices Guideline for Services Sector

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FOREWORD

The development of green practice guidelines is a continuation of the implementation of the MyHIJAU Program under the Ministry of Environment and Water (KASA) and the Malaysian Green Technology and Climate Change Corporation (MGTC) which is a coordinating agency and secretariat for the program. This program has been approved by the National Council for Green Technology and Climate Change (MTHPI) which was held on 23 October 2012. This is one of the Government's initiatives in the development of Green Technology in Malaysia. It is in line with the implementation of the National Green Technology Policy as well as the direction of Sustainable Consumption & Production (SCP) to encourage local manufacturers, producers and suppliers, especially to companies and Small and Medium Enterprises (SMEs). In addition, it will also focus on the Government's initiatives and direction in the development of the country's SMEs.

The development of Green Practice Guidelines is to provide guidance to the green industry in implementing green practices at the preliminary stage, during and after construction is implemented. These guidelines also have an implementation direction to ensure that these Guidelines will continue to be referred to and used by all parties, especially industry players to help achieve the government's goal of implementing green development in Malaysia. This green practice can help the industrial sector to have the potential to venture into the field of green technology, especially in the production of green products and services, as well as increase the encouragement of producers, manufacturers and suppliers to apply green technology in the premises, production process and operation. These Guidelines are more towards the requirements that need to be put into practice so that industries, companies and organizations have green practice guidelines that can be referred to as well as help companies achieve the government's goal of using green practices in line with SDG 12.6, which is to encourage the industry to use sustainable practices and integrate information sustainability into the reporting cycle.

Referring to the twelfth Malaysia plan under the eighth main focus which is to accelerate green growth, where this green practice development program is able to play a very important role in being a catalyst to ensure that these green practices are more practical and applicable to all parties in the green industry whether directly or indirectly for local companies and businesses to gain exposure to this green industry practice guide.

Therefore, increasing productivity and long-term profits through environmental, social and governance (ESG) elements should be applied in decision-making by ensuring that companies focus on reducing the negative impact on the environment. Although Malaysia only contributes 0.7 percent to greenhouse gas emissions, the Government will continue to fulfil its commitment to reduce GHG emission intensity up to 45 percent to GDP in 2030, based on emission intensity in 2005, in line with the aspiration to become a low carbon country.

It is hoped that this goal can be achieved by focusing on the industry to understand the importance of green practices in business by applying knowledge about the benefits and applications of green technology as well as the implementation strategy of the green practice monitoring mechanism in business management to obtain the recognition of the green industry.

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PREFACE

Malaysia's services sector serves as the largest contributors to the economy. According to Department of Statistic Malaysia in fourth quarter of 2021, services sector contributes 57.5% to Malaysia Gross Domestic Product (GDP). In fact, service sector has provided job opportunities to more than 10% of the Malaysia's current population (32.655 million people as of July 2021). As of Q4 202, this sector contributes a revenue of RM 460.0 billion, with 3.7 million people are engaged in this sector. As Malaysia shifts to embrace the Fourth Industrial Revolution, services sector is also evolving to become more knowledge-intensive and productivity-driven. Many global organizations have seized the growing opportunities and cost-competitive business environment present here, and made Malaysia their hub, catering to their services operations in the region and beyond. Nevertheless, with this rapid expansion, services sector poses threats to the human beings and the environment in general. Robust policies and guidelines are needed in this sector to optimise its contribution to achieving many sustainable development objectives. This guideline is timely to provide recommendation and directions for the service organizations towards sustainable and green services, particularly on capturing the tools, methodologies, and protocols; piloting and assessing policy options and facilitating intergovernmental and multi stakeholder dialogue.

ABBREVIATION	
ACE	Air Change Effectiveness
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BEI	Building Energy Intensity
BEIT	Building Energy Intensity Tool
BOD	Biochemical Oxygen Demand
CFC	Chlorofluorocarbons
EB	Existing Building
EC	European Commission
EPA	United States Environmental Protection Agency
EQA	Environmental Quality Act
ETS	Environmental Tobacco Smoke
F&B	Food and Beverage
GBI	Green Building Index
GDP	Gross Domestic Product
GGP	Government Green Procurement
GHG	Greenhouse Gases
GSTC	Global Sustainable Tourism Council
GT	Green Technology
GTFS	Green Technology Financing Scheme
GTMP	Green Technology Master Plan 2017-2030
HCFC	Hydrochlorofluorocarbons
HVAC	Heating, ventilation, and air-conditioning
ISO	International Standard Organization
IWK	IndahWater Konsortium
KASA	Ministry of Environment and Water
KeTTHA	Ministry of Energy, Green Technology and Water
MGTC	Malaysian Green Technology and Climate Change Corporation
MIDA	Malaysia Investment Development Authority
MOTAC	Ministry of Tourism, Arts, and Culture
NC	New Construction
NCCP	National Climate Change Policy
NGO	Non-governmental Organization
NGTP	National Green Technology Policy
NLA	Net Lettable Area
NPP II	Second National Physical Plan 2010-2020
NREB	Non-Residential Existing Building
NRNC	Non-Residential New Construction
OTTV	Overall Thermal Transfer Value
pHJKR	Penarafan Hijau JKR
PWD	Public Works Department of Malaysia (JKR)
R&D	Research and Development
REHDA	Real Estate and Housing Developers' Association Malaysia
RMK-12	Malaysia's Twelfth Plan 2021-2025
RTTV	Roof Thermal Transfer Value
UN SDG	United Nation's Sustainable Development Goals
VOC	Volatile Organic Compounds
WHO	World Health Organization

TERMINOLOGIES	
Green Practices	Environmentally friendly practices in retail consumer usage and how they are perceived in a practical way.
Green Services	Those services which are environment friendly.
Green	The design, commercialization, and use of processes and products that are feasible and economical while reducing the generation of pollution at the source; and minimizing the risk to human health and the environment
Services	An industry made up of companies that primarily earn revenue through providing intangible products and services. Services industry companies are involved in retail, transport, distribution, food services, as well as other services-dominated businesses. Also called services sector, tertiary sector of industry
Consumers	Individuals or organisations that purchase and exchange a product or services or value to satisfy their needs.

PART I

INTRODUCTION TO SERVICES INDUSTRY

PART 1: INTRODUCTION

1.1 Background

Malaysia's service sector represents an enormous size of the economy in which it is contributing about 57.5% to the Gross Domestic Product (GDP) of the Malaysian economy in the fourth quarter of 2021 (DOSM, 2022). As the Malaysian economy develops and the nation moves towards achieving a developed nation, the services sector starts to undertake a greater role and function. It serves as a backbone of the social and economic development of the country and has emerged as the largest and fastest-growing sector in the world economy, making higher contributions to the global output and employment. However, the rapid expansion of the services sector contributes to the global climate change and natural disasters issues have created an alarming situation for the whole world. The awareness of environmental protection is an issue of high topicality and relevance.

1.1.1 Categorization of Services Sector

There are many definitions and categorizations of service sectors and in general, this sector covers a wide range of activities like healthcare, hospitality, education, transportation, communication, entertainment, financial trading, leasing, and professional services. The era of economic liberalization has ushered in a rapid change in the service industry. As a result, over the years, Malaysia is witnessing a transition from an agriculture-based economy to a knowledge-based economy. The services hold immense potential to accelerate the growth of an economy and promote the general well-being of the people. They offer innumerable business opportunities to investors. They can generate substantial employment opportunities in the economy as well as increase its per capita income.

According to the Department of Statistics Malaysia, the services sectors are divided into 4 (four) main categories namely:

(1) Wholesale & Retail Trade, Food & Beverages, and Accommodation
(2) Information & Communication and Transportation & Storage
(3) Health, Education and Arts, Entertainment & Recreation, and
(4) Professional and Real Estate Agent.

This categorization of the services sector is shown in Figure 1.1.

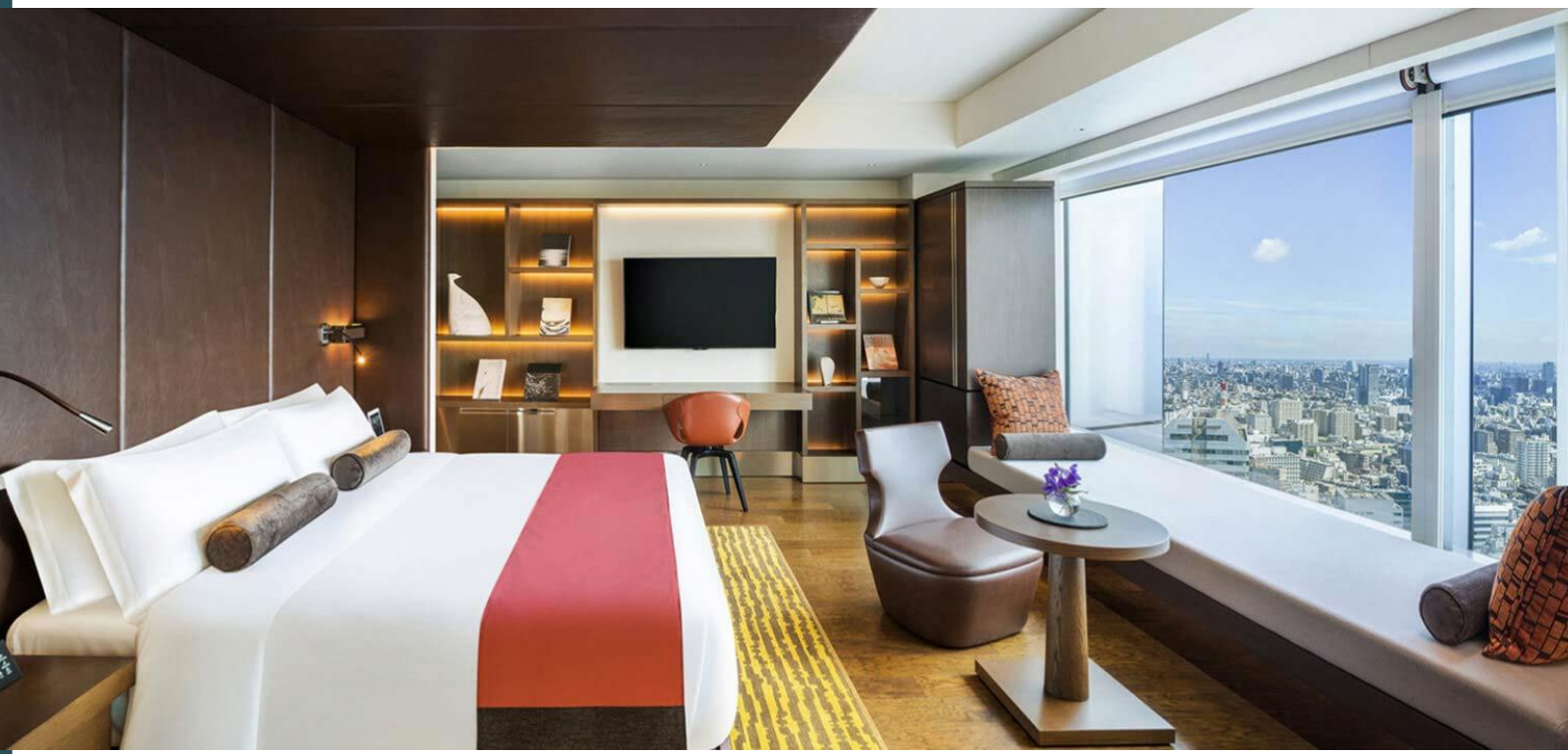
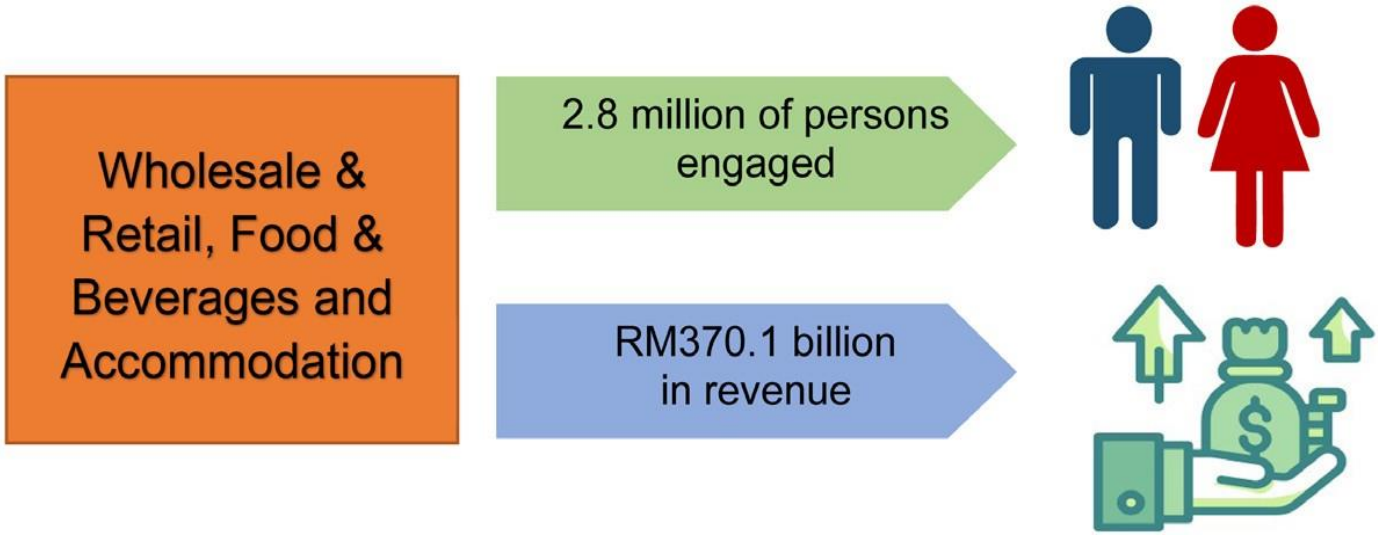


Figure 1.1: Category of Services Sector (DOSM, 2022).

Based on this categorization, the category of Wholesale & Retail, Food & beverage, and Accommodation contribute to the highest revenue of RM370.1 billion with 2.8 million persons engaged in the services sector.



The definition of the service sector is further explained by the Malaysia Investment Development Authority (MIDA, 2020) in which Malaysia's strong service sector is ever-expanding with an increasing focus on high technology, providing competitive advantages for other industries. MIDA focuses on promoting the services sector and categorized this sector into ten sub-sectors. Figure 1.2 shows the categorization.

Figure 1.2: Category of Major Services Sub Sector (MIDA 2020).

Ministry of International Trade and Industry (MITI) also specifies that this sector becomes the target for investment, domestic or otherwise. There are 12 sectors classified under services and each of these sectors has its respective World Trade Organisation (WTO) classification which defines its scope. This is exhibited in Figure 1.3.

BUSINESS	COMMUNICATION	CONSTRUCTION & RELATED ENGINEERING
DISTRIBUTION	EDUCATION	ENVIRONMENTAL SERVICES
HEALTH RELATED& SOCIAL SERVICES	TOURISM & TRAVEL RELATEDSERVICES	TRANSPORT

Figure 1.3 World Trade Organisation (WTO) classification of Services Sector

Looking into the broad scope of the categorization of the services sector, it is noted that the category of Wholesale & Retail, Food & Beverages, and Accommodation is the largest category that produced a significant contribution to the Malaysian economy. It is appropriate to provide focus on this category particularly tourism and travel-related services. Tourism plays an important role for nearly all WTO members, especially in terms of its contribution to employment, GDP, and the generation of foreign exchange. Tourism-related services are typically labour intensive, with numerous links to other major segments of the economy, such as transport, cultural and creative services, or financial and insurance services. Basically, tourism and travel-related services include services provided by hotels and restaurants (including catering), travel agencies and tour operator services, tourist guide services, and other related services.

1.1.2 Contribution of Services Sector

Being one of the largest contributors to the economy, the services sector, played an important role in Malaysia's economy. This is proven by the Report from that Malaysia's strong service sector is ever-expanding with an increasing focus on technology which provides a competitive advantage for other industries. Figure 1.4 shows some key highlights of the services sector in terms of different types of investment and job opportunities.

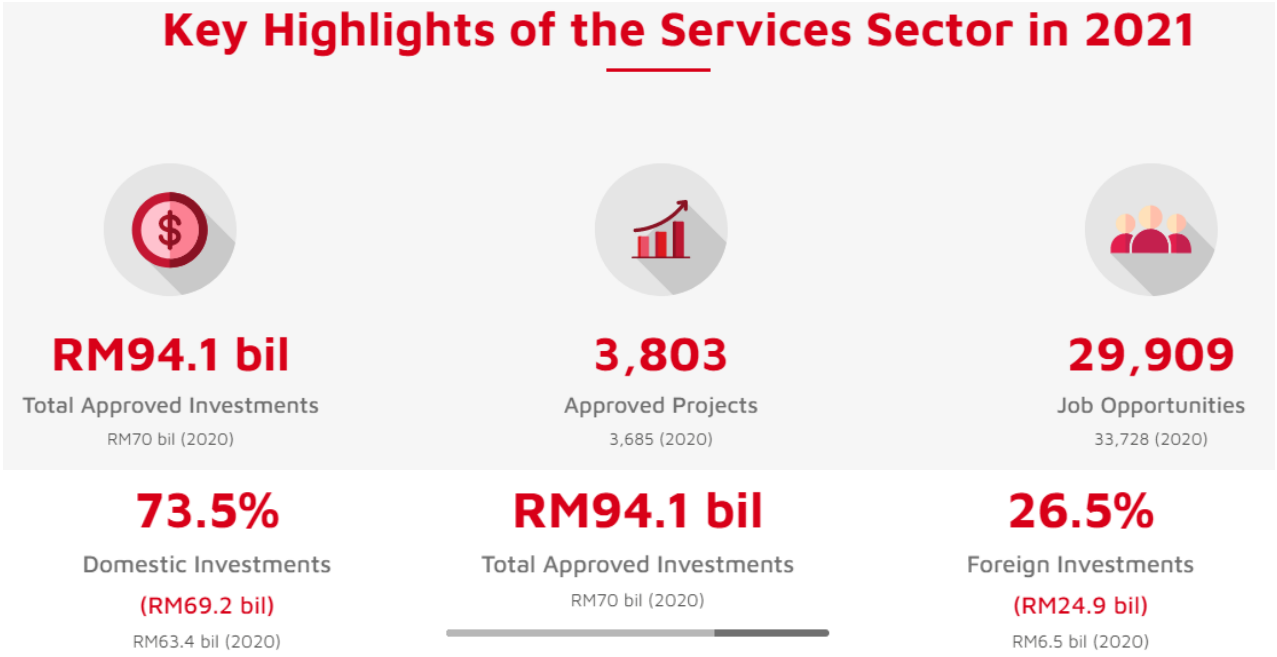


Figure 1.4: Key Highlights of the Contribution from Services Sector, MIDA, (2022)

In terms of the overall performance of the services sector for the second quarter of 2022 from DOSM (2022), total revenue was recorded at RM506.6 billion, registered growth of 25.2 percent as compared to the same quarter of 2021. The increment was fuelled by the Wholesale & Retail Trade, Food & Beverage, and Accommodation segment (+RM84.8 billion; 26.1%). Meanwhile, total revenue every quarter registered a growth of 7.1 percent or RM33.8 billion.

The total number of persons engaged in this sector amounted to 3.8 million persons, which rose by 177600 persons or 4.9 percent as against the corresponding period of the previous year. Salaries & wages paid in the second quarter of 2022 posted a growth of 9.3 percent to reach RM25.8 billion on a year-to-year basis. Figure 1.5 shows the contribution of the services sector from the Second Quarter of 2022.

Specifically, from the statistic, Wholesale & Retail Trade, Food & Beverages, and Accommodation has demonstrated the highest contribution of RM409.3 billion as compared to the previous quarter. Specifically, Food & Beverage and Accommodation have been the most dominant with significant contributions to the services sector. The number of persons engaged in this segment shows the highest as compared to other categories with 2.9 million people with a salary paid of RM15.9 billion. This information is illustrated clearly in Figure 1.5.

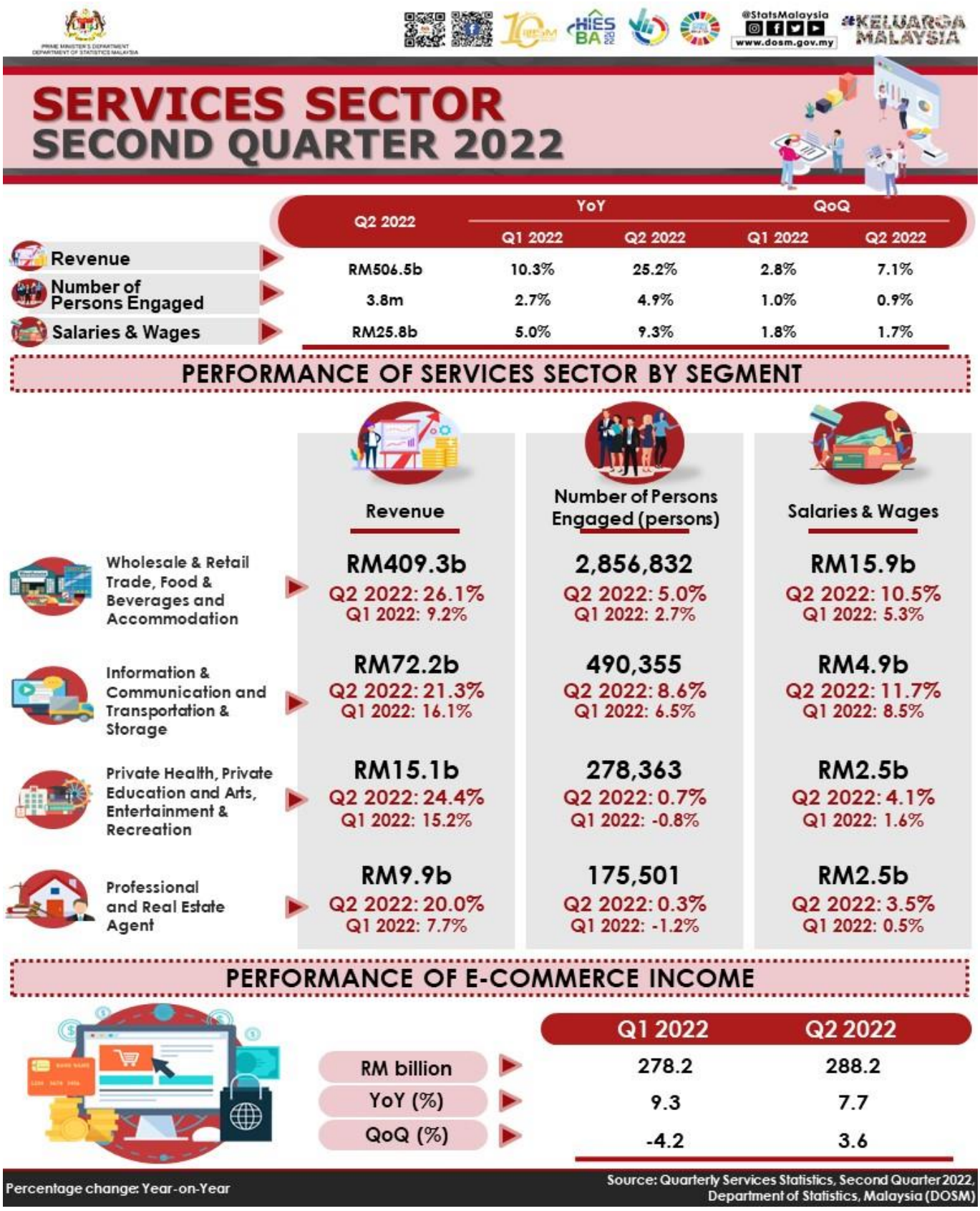


Figure 1.5: Performance of Services Sector, Second Quarter 2022, Department of Statistics Malaysia.

The above information has proven that the services sector has escalated tremendously, and it has since evolved with the advancement of technology as well as socio-economy, providing myriads of choices as they have loomed from the high demands of the consumers. This opens opportunities for businesses and industries to compete in a healthy environment where creativity brings new ideas and innovation to the sector. However, while these services are notably improving in terms of quality and quantity, increasing demand leads to further wastage of resources. This includes natural resources and materials that resulted from carbon emissions and wastage of the environment. Concurrently, the utilization of more natural resources eventually leads to the depletion of these resources, hence the call for more sustainable practices.

The changing lifestyle and high standard of living have increased the dependency on services. These services are not just providing comfort to us but are responsible for huge resource consumption, carbon emission, spreading heavy wastage, and harming the environment in several ways. It is not obvious to casual viewers how service organizations that offer products such as transportation, healthcare, and hotels can harm the environment. Services are essential processes and as such are consumed as they are produced; they are intangible, could not be stored (perishable), and are heterogeneous. These characteristics seemingly render services products as little threats to the environment. Worldwide the service sector has become aware of these effects on the environment and has taken steps by adopting green initiatives. Nevertheless, not much attention has been accorded to the service sector in terms of green practices. While sustainable practices focus on the number of natural resources used to prevent depletion, green practices, on the other hand, prioritize on eco-friendliness. The advancement of technology and science may lead to the innovation of alternative resources to sustain the current needs of the consumers however leads to the question of whether waste management is a concern. The creation of new materials to replace natural minerals may require higher energy consumption, leading to global warming. Thus, current practices will have to change by focusing on green practices. Figure 1.6 shows the UN SDG.

Figure 1.6 Sustainable Development Goals (UNESCO, 2015)

As we are geared toward championing the good cause of the United Nation's Sustainable Development Goals (UN SDG) by 2030 (Figure 1.6), there are several aspects have been outlined in the 17 goals of UN SDG. By mapping the key guidelines toward green practice in the services sector, environmental issues are expected to be overcome, if not reduced for the betterment of mankind in time to come. Relevant UN SDG with regards to green practices in the services sector would be:

In addition, organizations are required to follow the standard of Environmental, Social, and Governance (ESG) Criteria. The ESG Criteria are a set of standards for a company's operations that socially conscious investors use to screen potential investments. Environmental criteria consider how a company performs as a steward of nature. Social criteria investigate how it manages relationships with employees, suppliers, customers, and the communities where it operates. Governance handles a company's leadership, executive pay, audits, internal controls, and shareholder rights. The key takeaways and The ESG is illustrated in Figure 1.7.

KEY TAKEAWAYS

- Environmental, social, and governance (ESG) criteria are an increasingly popular way for investors to evaluate companies in which they might want to invest.
- Many mutual funds, brokerage firms, and robo-advisors now offer products that employ ESG criteria.
- ESG criteria can also help investors avoid companies that might pose a greater financial risk due to their environmental or other practices.

Figure 1.7 Environmental, social and governance criteria

1.1.3 Environmental Issues

The services sector contributes 57.0% of the GDP of Malaysia's economy and surely this sector contributes significantly to the environmental issues in Malaysia. Environment Statistics 2020 (DOSM, 2020) reported the environmental statistics from six (6) components:

The negative environmental impacts are substantial i.e., the depletion of local natural resources, pollution, and waste problems which lead to soil erosion, increased pollution, natural habitat loss, and more pressure on endangered species.

Scheduled wastes from services sector

7.185 million tons
in 2020

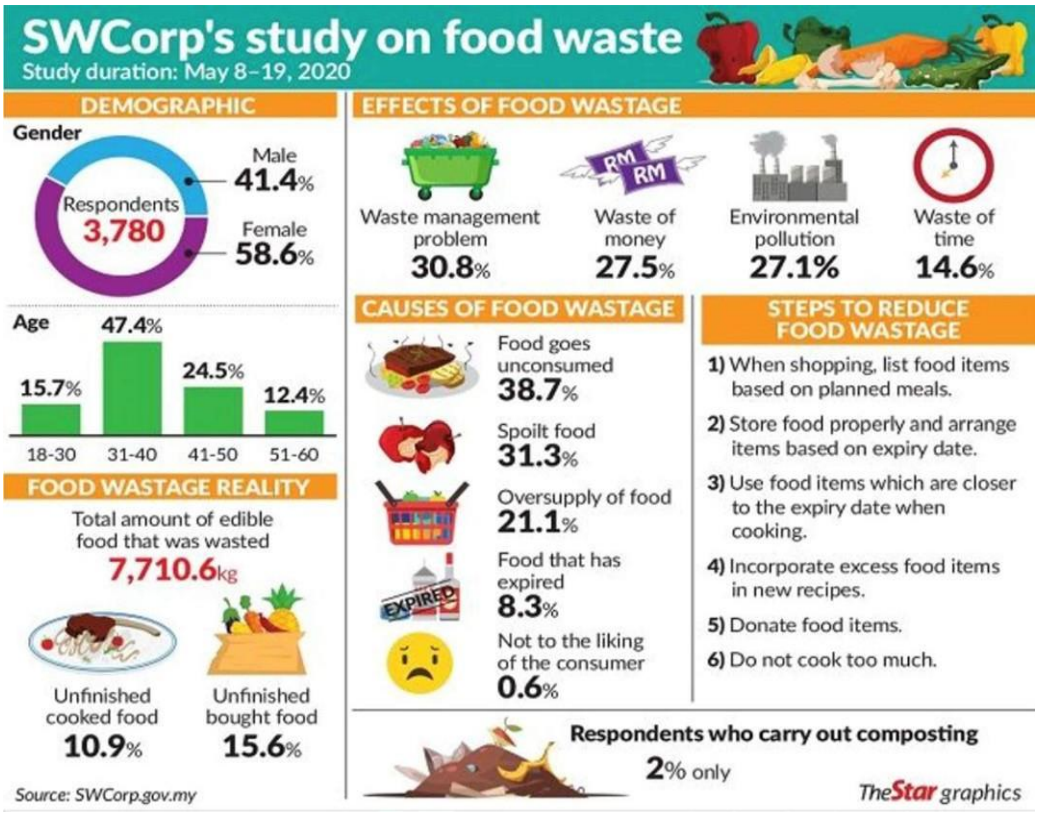
Scheduled waste and clinical waste are the categories under waste listed in the First Schedule Environmental Quality (Scheduled Wastes) Regulations, 2005 under Environmental Quality Act 1974. The scheduled waste increased 79.0 percent from 4,013.2 tonnes in 2019 to 7,185.2 tonnes in 2021 (DOSM, 2021).

For tourism and travel, related services, based on the Domestic Tourism Survey 2021, beach and sea activity is one of the main activities for tourism purposes. It was reported that in 2021, the tourism industry contributed:

12.8% GDP	**RM197.9 Billion**

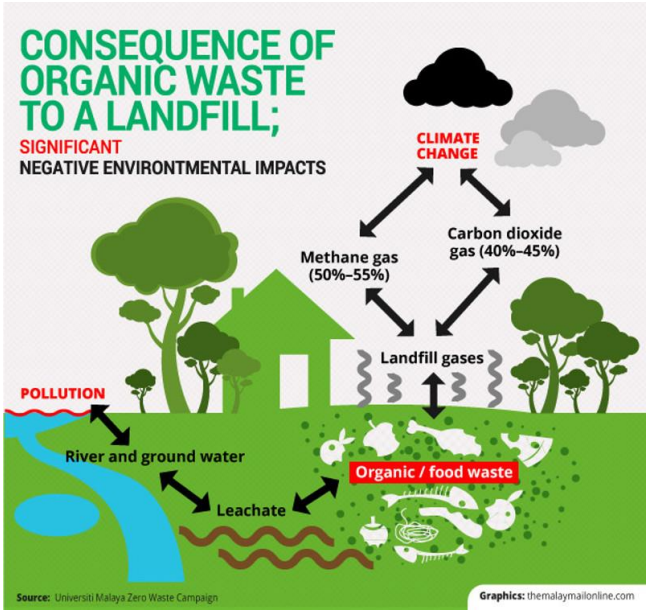
However, coastal areas tend to be vulnerable to various threats, especially erosion. The impact of the erosion will cause losses to the tourism sector and economic resources. In general, Malaysia's coastline was 8,840.0 km and 1,347.6 km has experienced coastal erosion until 2019. Sarawak with a coastline of 1,234.1 km experienced coastal erosion of 492.5 km length followed by Sabah (429.3 km) and Perak (95.1 km).

In terms of food waste, a study from SWCorp from May 8-19, 2020, showed that the effects of food wastage in Malaysia are alarming, and the exhibit below shows the details of the food waste from various industries in Malaysia.



Source: SWCorp's study on Food Waste (The Star, 2020).

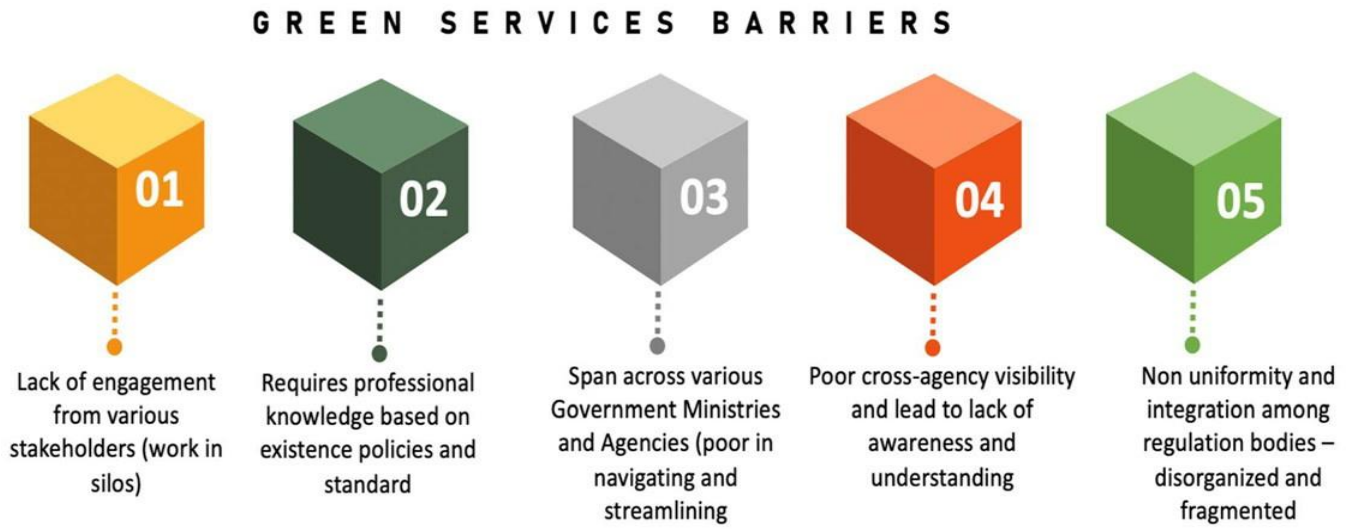
The impact of waste is critical as it provides many consequences to a landfill. This is shown below in which it provides a significant adverse environmental impact. It started with the pollution of the river and ground water that eventually led to the emission of methane gas and carbon dioxide gas. Over 800 million people living in more than 570 cities were vulnerable to sea-level rise and coastal flooding (World Green Building Council, 2021). 1.6 billion urban people were regularly exposed to extremely high temperatures (World Green Building Council, 2021).



Here are the top 10 environmental issues facing humanity:

1.1.4 Issues, Challenges, and Benefits

Green practices posed many benefits and opportunities for the services sector to propel their performance. Issues and challenges faced by the services industry in Malaysia are generally attributed to many factors. The barriers to green services are shown below.



Specifically, the benefits, opportunities, weaknesses, and threats of the green services which were derived from the stakeholders are exhibited below:

	BENEFITS
1	Efficient use of resources.
2	Advance green initiatives and culture in the premises.
3	Reputation and brand image.
4	Sustainable growth and profitable in long run.
5	Advance strategies for a low carbon and resource efficient economy.
6	Improved productivity for more utilization of natural resources.
7	Mitigate the adverse impacts of traditional work practices.

	OPPORTUNITIES
1	The monetary (tax relief) and non-monetary (advisory supports, reports) green initiatives.
2	New knowledge generation for the education system.
3	Job creations and livelihoods in the new era.
4	Malaysia's circular economy potential (Single Use Plastic Roadmap 2018-2030).
5	Quality of life with the prevention in pollution.
6	The industry revolution with green technology.
7	Training and Development for upskilling and reskilling.




WEAKNESSES	
1	High costs of investment in Green Practices (technology, systems, tools).
2	Lack of expertise and mentors (technical know-how and resources).
3	Lack of knowledge, competencies and experiences in green technology due to limited training & development, green workshops, green materials and hands-on activities.
4	Low level of motivation and passions (behaviour and attitudes).
5	Lack of resources (tangible and intangible).
6	Low awareness and readiness on green practices.
7	Lack of proper measurement and KPI for green practices.

THREATS	
1	High in Greenhouse Gases (26% of global greenhouse gas emissions).
2	High land use (50% of global habitable land).
3	Deficit in using more resources and its ecosystems.
4	Uncertain in volatile environment particular during the pandemic of Covid19.
5	Fierce competition from developed countries with advanced green practices.
6	Unable to cope with rapid demand in green technology due to fast changing in the processes and workflows.
7	Lack of enforcement from the government.
8	Non uniformity and integration among regulatory bodies on green initiatives – disorganised and fragmented.
9	Lack of incentives and initiatives from the Government.
10	Lack of synchronization from different players and stakeholders (government, agencies, academician, industries, communities).

1.2 The Green Industry

The Twelfth Malaysia Plan 2021-2025 (Twelfth Plan) was presented with the objectives to focus on current issues and at the same time restarting and rejuvenating Malaysia's socioeconomic development for long-term sustainability and prosperity. This plan was crafted with the focus of 'A Prosperous, Inclusive, Sustainable Malaysia', which encompasses the first half of the Shared Prosperity Vision, 2030. Resonating with the themes of the Twelfth Plan, the focus areas emphasized on the 10 agenda, and Agenda 8 and Agenda 9 were specifically focused on 'Advancing Green Growth for Sustainability and Resilience' and 'Enhancing Energy Sustainability and Transforming the Water Sector' respectively.

Malaysia aspires to be a low-carbon nation by 2050 through the unconditional commitment to reduce GHGs emissions (against GDP) by 45% in 2030 compared to the year 2005. The GHGs coverage includes seven GHGs: carbon dioxide (CO^2), methane (CH^4), nitrous oxide (N^2O), hydrofluorocarbons (HFCs), perfluorocarbon (PFCs), sulphur hexafluoride (SF^6) and nitrogen trifluoride (NF^3). In the Twelfth Plan, enhancing green growth is one of the pertinent agendas for accomplishing the shared prosperity vision, not only in terms of economic growth but also for environmental sustainability and social inclusivity. In this manner, green growth will be bolstered to ensure sustainability and resilience. This will be done by implementing a clean, green, and resilient development agenda through the whole-of-nation approach. Green growth strategies will ensure planetary health and a better quality of life, enhance the resilience of the nation as well as conserve and protect the environment for current and future generations. Both agendas are illustrated below:

Commitments and policy initiatives of Malaysia toward the environment at national and international are well documented. This aspiration is in line with the Malaysian government's commitment to climate action and green technology. It ranges from the general direction setting in the Eleventh Malaysia Plan (2016-2020) as well as in the Twelfth Malaysia Plan to specific targets on environmental commitments. The summary of the main policy/ plan/program documents related to the environment in Malaysia is shown below:

Figure 1.8 The summary of the main policy/plan/program documents related to the environment in Malaysia

These documents and policies are briefly explained below:

Policy/Plan Documents	Description
12th Malaysia Plan	The initiatives are to advance green growth as a game-changer that incorporated the economic, social, and environmental pillars of sustainable development to better prepare the nation in meeting future challenges.
11th Malaysia Plan	Policy initiatives in the Eleventh Malaysia Plan are formulated to shift the method of development from conventional to a greener method (Green Growth) that will ensure that socio-economic development is pursued more sustainably. Malaysia targets to be a high-income nation by 2020 in low carbon, resource-efficient, and socially- inclusive aspects.
Second National PhysicalPlan (NPP II, 2010-2020).	Long-term strategic framework for national spatial planning to tackle climate change; conserve natural and biological resources; establish carbon sinks, sustainable forest, and water management.
National Policy on Biological Diversity	The policy aims to transform Malaysia into a leading nation in research, conservation, and utilization of tropical biological diversity by the year 2020. It also stated that Malaysia's biological diversity is conserved and ensures that the components are utilized sustainably for continued progress and socio-economic development of the nation.

National Policy on the Environment	It was formed in 2002 to continue the economic, social, and cultural progress of Malaysia to enhance the quality of life of its people,through environmentally sound and sustainable development. There are eight key principles of the policy: Stewardship of the Environment,Conservation of Nature's Vitality and Diversity, Continuous Improvement in the Quality of the Environment, Sustainable Use of Nature Resources,Integrated Decision-making, Role of Private Sector, Commitment and Accountability, and Active Participation in the International Community.
National Mineral Policy 2	The objectives of the National Mineral Policy 2 are: to ensure the sustainable development and optimum utilization of mineral resources; to promote environmental stewardship that will ensure the nation's mineral resources are developed in an environmentally sound, responsible and sustainable manner; to enhance the nation's mineral sector competitiveness and advancement in the global arena; to ensure the use of local minerals and promote the further development of mineral-based products; and to encourage the recovery, recycling and reuse of metals and minerals.
National Water Resources Policy (NWRP)	This policy that ensures the use of these precious natural resources, is guidedby the principles of sustained yield management. The priority then was to address concerns relating to the factors that threaten the stability of hydrological regimes. This policy adopted measures to ensure the sustainability of water resources to achieve water security. The policy requires forging of partnerships between all levels of government and stakeholders to ensure that water resources are made a national priority
Solid Waste Management Policy	This is related to an approach for the development of a solid waste system management that is comprehensive, cost-effective, sustainable, integrated,and socially acceptable with conscious preservation of the environment. The policy also hopes to implement solid waste management referring to the waste management hierarchy that prioritizes waste production through the Reuse, Reduce, and Recycle (3R), intermediate treatment, and final disposal.
National Policy on Climate Change	The policy was formed in 2019 to ensure climate-resilient developmentto fulfill national aspirations for sustainability. The objectives are to mainstream the climate change through wise management of resources and enhance environmental conservation resulting in strengthened economic competitiveness and improved quality of life; to integrate responses into national policies, plans, and programs to strengthen the resilience of development from arising and potential impact of climate change; and to strengthen the institution and implementation capacity to better harness opportunities to reduce negative impacts of climate change.
National Renewable Energy Policy and Action Plan	This policy document is developed to enhance the use of renewable energy resources which contributes to sustainable socio-economic development and national electricity supply security. Five objectives ofthe policy are determined which include: to increase renewable energycontribution in the national power generation mix, ensure reasonable renewable energy generation cost, conserve the environment for future generation, facilitate the growth of the renewable energy industry, and enhance awareness on the role and importance of renewable energy

Green Technology Policy	The National Green Policy was launched by the Prime Minister of Malaysiain 2009. Green Technology shall be a driver to accelerate the national economy and promote sustainable development. The objectives of the policy are: to minimize the growth of energy consumption while enhancing economic development; to facilitate the growth of the GT industry and enhance its contribution to the national economy; to increase national capability and capacity for innovation in GT development and enhance Malaysia's competitiveness in the global arena; to ensure sustainable development and conserve the environment for future generations; to enhance public education and awareness on GT and encourage its widespread use. Thefour pillars of green energy policy constitute: (i) Energy – seek to attainenergy independence and promote efficient utilization, (ii) Environment –conserve and minimize impact on environment, (iii) Economy – enhance national economic development using green technology, and (iv) Social – improve the quality of life for all.
Government Green Procurement (GGP)	GGP is the acquisition of products, services, and work in the public sectorthat considers environmental criteria and standards to conserve the natural environment and resources, which minimizes and reduces the negative impacts of human activities. The project is meant to improve the efficiency of government procurement and transform the Malaysianeconomy into Green Economy
Green Technology Financing Scheme (GTFS)	Green technology is one of the important features of Malaysia's target for green growth. To pursue green growth, the Government has strengthened enabling environment, particularly in terms of policy and regulatory framework, human capital, green technology investment, and financial instruments. The Green Technology Financing Scheme (GTFS) was introduced in 2010 to accelerate the growth of green technology byproviding easier access to funding from financial institutions for companiesventuring into green businesses. In addition, the Scheme also aims to generate new markets and drive job creation.
National Tourism Policy 2020-2030	Malaysia's tourism industry has been competitively challenged in the international arena as the industry faces numerous changes, hence National Tourism Policy 2020-2030. Comprised of 3 pillars and 6 strategies, this policy intends to drive Malaysia to be a top ten tourism destination throughout the world. The 6 transformation strategies are executed using 22 strategic actions via 32 tactics, focusing on 17 typesof tourism.
National Ecotourism Plan2.0, 2020-2030.	The National Ecotourism Plan 2.0, with the theme "Malaysia: Premier Ecotourism Destination", is parallel with the National Tourism Policy 2020-2030. This plan consists of 5 focus areas with 21 strategies via 87actions. Among the focuses are to increase investment in ecotourism, introduce tourism concessions in ecotourism sites, and strike the balance and synergy between ecotourism and conservation.

1.3 Purpose and Benefits of Green Services Guideline

This guideline could serve as a point of reference for services industries, in tandem with the third theme in Malaysia's Twelfth Plan 2021-2025 (RMK-12): Advancing Sustainability, where the government intends to address the water issue and enhance energy sustainability.

This green service guideline can serve as a standard applicable to all operators nationwide towards a similar cause in providing a better service, with the aim to reduce wastage and the usage of resources.

Further, business owners would be able to anticipate the costs and benefits of implementing these new practices

A proper guideline would give businesses ideas on strategizing as well as implementing new green initiatives and culture in their premises.

Easily accessible guidelines for implementation and standard benchmarking / calculation / performance measurement.

More incentives to the industry player (ie current tax incentive for green procurement does not include consumable products).

For sustainable business efficiency, empowerment and support from government to drive more companies towards green business development To save the earth be at par with green initiatives standard and use of more eco-friendly (e.g.E0 and E1) grade products.

A guideline that provide clear direction and understanding on green transformation and practices. Protect the environment , natural resources and also focus on renewable energy that will good for future.

More opportunity for the younger generation (jobs and knowledge from the modern generation in terms of idea, vision and implementation).

Simple and easy guidelines across the board which can be followed by many industries no matter giant or small businesses.

Convert Guidelines into law ensure the information medium can be reached to the all sectors.

1.4 Scope and Application

This green services guideline can serve as a standard applicable to all services sectors and specifically for tourism and travel-related services. A proper guideline would give businesses ideas on strategizing as well as implementing new green initiatives and culture on their premises. Based on the discussion on the categorization of the services sector above, it is suggested that the scope and application of these guidelines would be applied specifically for tourism and travel-related services. However, these guidelines at any time could also be used across the whole services sector.

Based on the WTO definition of Tourism and Travel-Related Services, the Green Practice Guideline for Services Sector encompasses the following scope: 1) Services provided by hotels and restaurants (including catering), 2) travel agencies and tour operator services, 3) tourist guide services and 4) other related services.
Figure 1.9 shows the category.

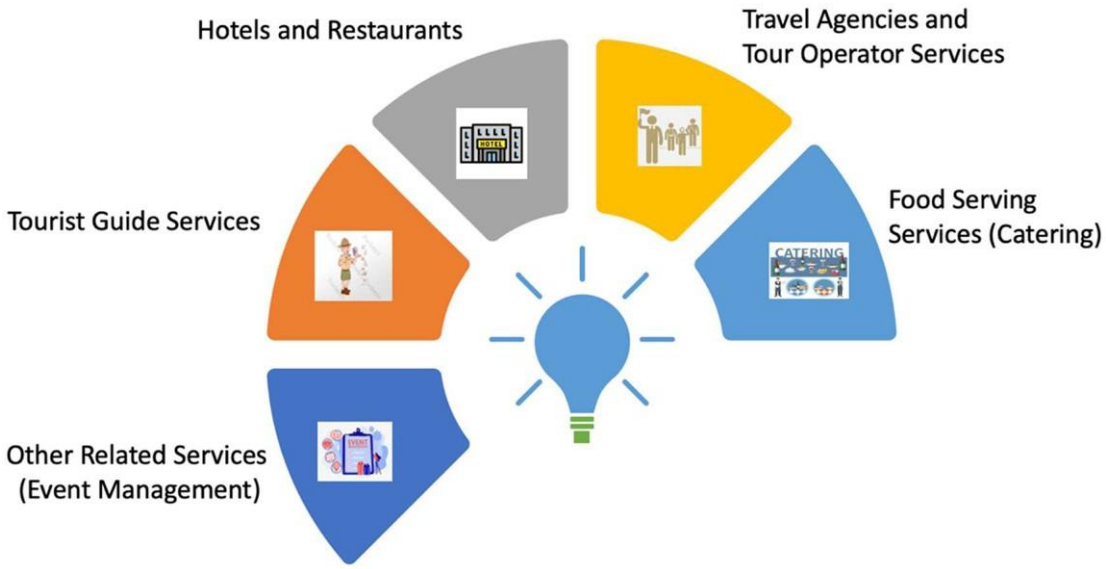


Figure 1.9 Tourism and Travel-Related Services (WTO, 2022)

PART II

OPERATIONAL DEFINITION AND TERMINOLOGIES

PART II: OPERATIONAL DEFINITION AND TERMINOLOGIES

2.1 Definition of Green Services

Green services are defined as services that are environmentally friendly. Green services aim to lure green consumers, both new and practicing besides promoting awareness of saving the environment.

2.2 Regulation, Standards, and Guidelines Related to Services Sector

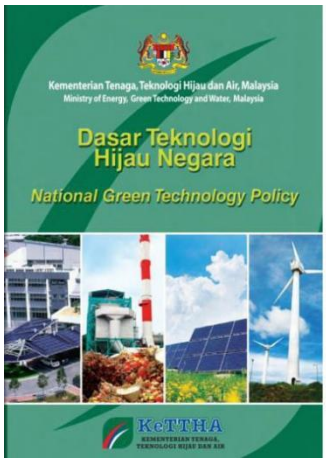
Although Malaysia has undertaken a significant effort to modernize business regulations in green business it still lags many developed countries in regulatory quality and environment. The regulatory framework for the services sector which spans various government ministries and agencies has led to difficulty in navigating and streamlining regulations of the sector. In addition, industry players often find existing regulations and practices to be either outdated or cumbersome.

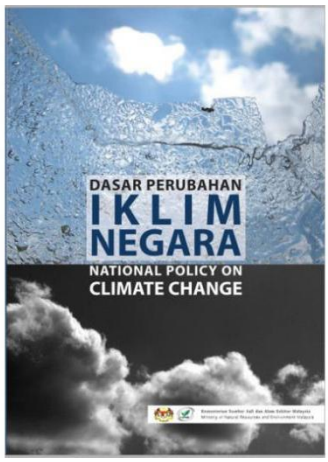
Given the involvement of multiple ministries and agencies in the development of the services sector, there is a need to ensure sectoral policy coherence with the national development objectives. The lack of central coordination of incentive programs has led to poor cross-agency visibility, scheme overlaps, and limited awareness among companies on the incentive offerings. The poor cross-agency visibility has also opened opportunities for rent-seekers to apply for similar incentives across multiple agencies.

The revolution of green technology in Malaysia is developing after the establishment of the Ministry of Energy, Green Technology and Water (KeTTHA) on April 9, 2009, with the vision to be the industry leader in the sustainable development of energy, the national water, and green technology product and services. This is triggered by climate change which is one of the most daunting challenges of the 21st century.

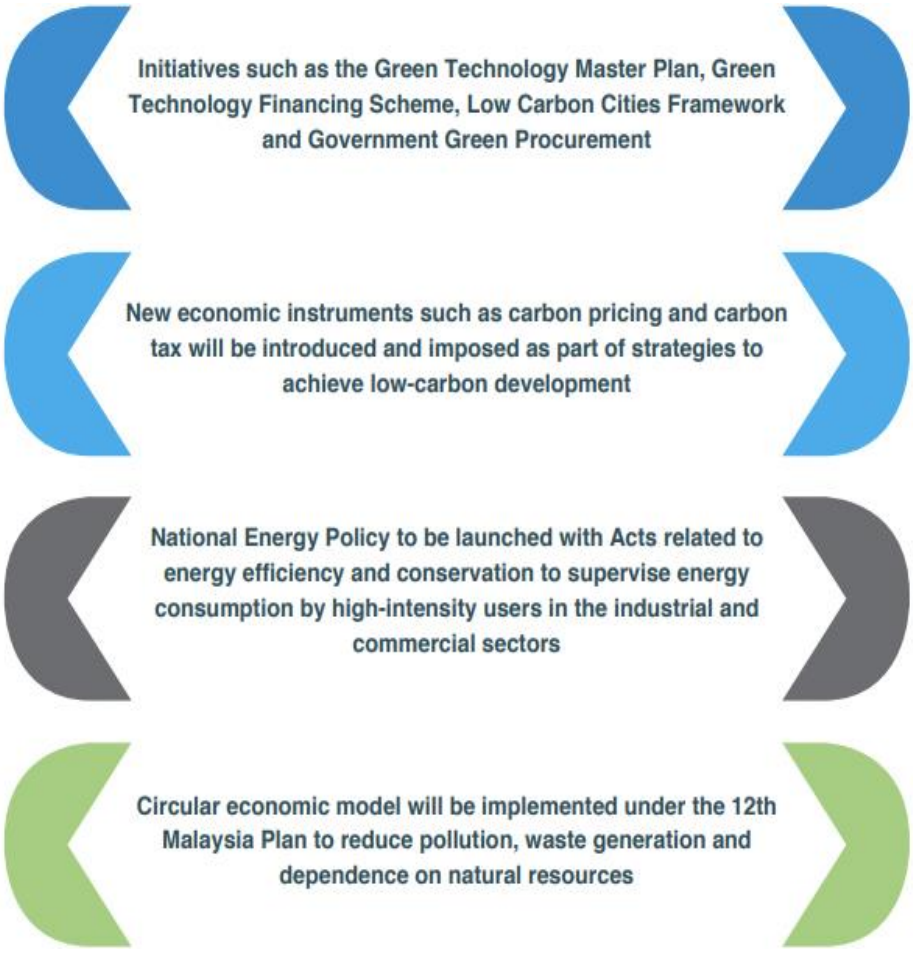
At its core is the fact that economic development should not compromise the environment and the GHGs emissions must be controlled to alleviate and slow down the impacts of climate change for the benefit of current and future generations. Since then, the Malaysian government has expedited efforts to plan, formulate programs and align policies to promote green technology as the government agenda to lead a new initiative addressing global issues on environmental pollution, ozone depletion, global warming, and other issues related.

The Malaysian Green Technology and Climate Change Corporation (MGTC), under the purview of the Ministry of Environment and Water (KASA), was tasked to lead the country's various sectors and industries with an emphasis on Green Growth, Climate Change Mitigation, and Green Lifestyle. The three national policies that encapsulate the role of MGTC are National Green Technology Policy (NGTP), the National Climate Change Policy (NCCP), and the (GTMP). The Green Technology Master Plan 2017-2030 (GTMP) however does not specifically highlight the services sector, as per included in the master plan, despite having targeted 6 sub-sectors.

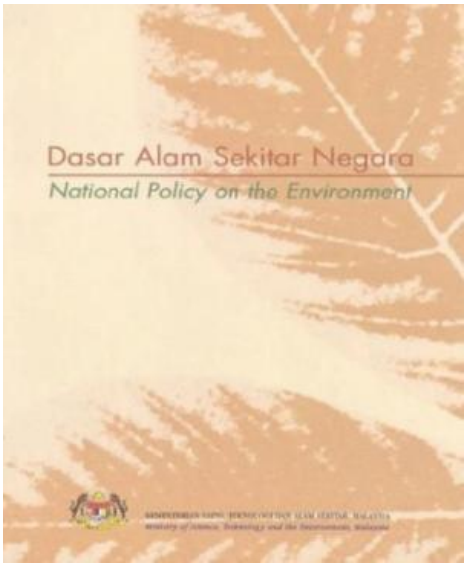




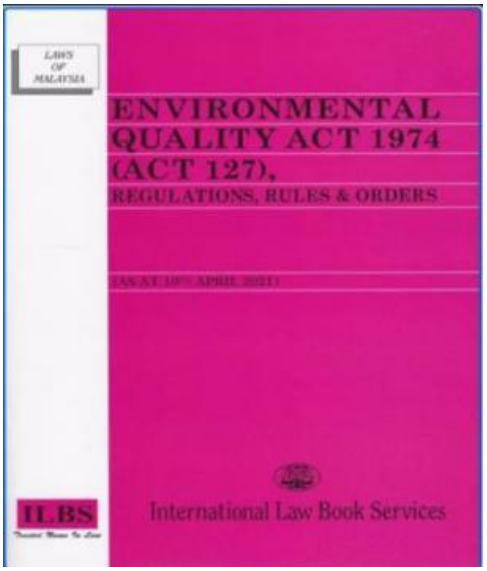
This aspiration is in line with the Malaysian government's commitment to climate action and green technology:



The services sector is very large with many sub-sectors and currently, there are very limited national standards that regulate the green practices in Malaysia's Service Sector. The services sector could refer to the following policy, standards, or plans. National Policy on the Environment (Dasar Alam Sekitar Negara) and Environmental Quality Act 1974 are the national policies that aim for continuous economic, social, and cultural progress and enhancement of the quality of life of Malaysians, through environmentally sound and sustainable development.



National Policy on the Environment.



Environmental Quality Act
(As of April 2021)

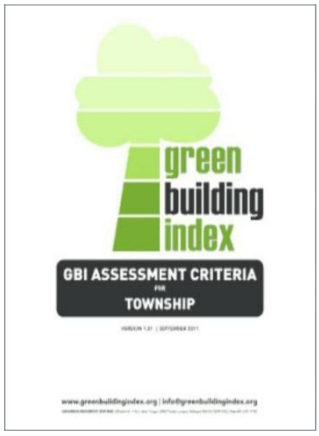
Apart from that, the wastage produced by the Services Sector which is regulated by statutes and subsidiary legislation introduced by the Department of Environment including:

Environmental Quality Act 1974 (Act 127)	Water Services Industry Act 2006 (Act 655)	Regulations of the Environmental Quality (Clean Air) Regulation 2014
Environmental Quality (Sewage) Regulations 2009	Environmental Quality (Prescribed Premises) Schedule Waste Treatment and Disposal Facilities) Order 1989	Environmental Quality (Scheduled Wastes) Regulation 2005

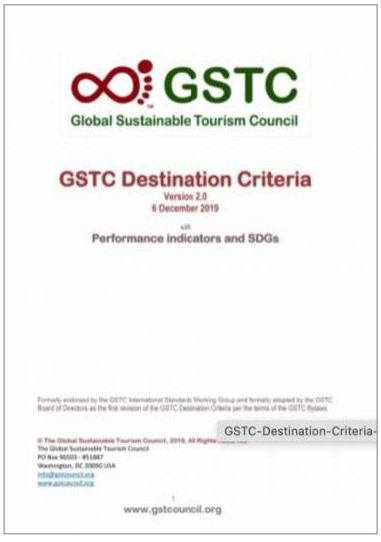
Green Practices performed by the Services Sector could also be referred to as Standards Malaysia which has been accepted as a signatory to various regional and international arrangements. The main motive of Standard Malaysia for businesses is to help improve efficiencies, reduce waste, and enhance quality for greater marketability of their products and services locally and internationally. The Standards Malaysia accreditation system is ensured fair and impartial through 3 operational levels i.e., a) strategy and policy, b) decision, and c) assessments. The Standards Malaysia accreditation system is following the international standard including The International Standard Organization (ISO). ISO develops 19,500 international standards applicable across industries. Common ISO standards which are relevant in green manufacturing practices include:

Figure 2.1: International Standard Operation relevant for green approaches in the services sector

As buildings and infrastructures house the businesses, the building should first comply with energy-efficient and green guidelines. In Malaysia, there are several certifications for the construction of green buildings. First, pHJKR is a guideline by the Public Works Department of Malaysia (PWD) for both residential and non-residential buildings amounting to less than RM 15 million. Subsequently, for buildings above the aforementioned value, developers would have to comply with the Green Building Index (GBI). Further, the introduction of GreenRE by the Real Estate and Housing Developers' Association Malaysia (REHDA) outlined the standards for developing green buildings that are resource, energy, and water efficient. Please refer below:



Currently, there are several initiatives and tax exemptions introduced to drive the green agenda in Malaysia, though not specifically for the services sector. Among them are the Green Investment Tax Allowance and Green Income Tax Exemption by the Malaysia Investment Development Authority (MIDA), to draw both local and foreign investors into injecting more capital into acquiring green facilities and infrastructure. Following the success of the Green Technology Financing Scheme 1.0 (GTFS), GTFS 2.0 and GTFS 3.0 were reintroduced to cushion the financial impact of promoting green initiatives at premises though it does not particularly target the services sector. For the hotel industry, the Ministry of Tourism, Arts, and Culture (MOTAC) currently practices the in-house green hotel certification which assesses on 10 criteria. Further, the ASEAN Green Hotel Standard is also applicable to Malaysian hotels to be certified green hotels in Malaysia.



A recent study by Langgat (2020) revealed that green practice among restauranteurs is relatively low. To date, there has been no regulation or standards outlining the green practices for the Malaysian food and beverage industry (F&B). This could be a major concern as food wastage increases over the years and this may hamper food source sustainability. As for the tourism sector, ecotourism and green tourism practice have often been interchanged. However, these two terms may have different definitions. According to National Ecotourism Plan 2016-2025, the definition of ecotourism refers to:

This indicates that ecotourism focuses on respect for nature, contribution to conservation, benefits to local communities, education, and awareness as well as emphasize on sustainability-ecologically, economically, socio-culturally, and ethically.

In the nutshell, the guidelines for green practices could be summarised in the table below:

MyHIJAU Mark Service- Local Green Competencies

Service Sector	Course Provider	Personnel Competency
Energy	Suruhanjaya Tenaga	• Energy Manager Course • Energy Audit Course
	SEDA Malaysia	• Grid-Connected Photovoltaic (PV) Systems Design Course • Renewable Energy Training Course
Building	CIDB/JKR-MyCREST	• MyCREST Facilitator
	GBI Sdn. Bhd.	• GBI Facilitator
	GREENRE Sdn. Bhd.	• GreenRE Facilitator
Transportation	Malaysia Automotive Institute(MAI)	• Energy Efficient Vehicle Training Course
Waste	Jabatan Alam Sekitar (DOE)	• Waste and air pollution control
	Indah Water Konsortium (IWK)	• Sewage Treatment Plant Operation (STPO) • HAZOP For Sewerage Systems & Water Treatment (HAZOP)
Water	Malaysia Water Academy(MWA)	• Water management

Source: Green Technology Master Plan 2017-2030

2.3 Terminologies

Green Practices

- Environmentally friendly practices in retail consumer usage and how they are perceived in a practical way.

Green Services

- Those services which are environment friendly.

Green

- The design, commercialization, and use of processes and products that are feasible and economical while reducing the generation of pollution at the source; and minimizing the risk to human health and the environment

Services

- An industry made up of companies that primarily earn revenue through providing intangible products and services. Services industry companies are involved in retail, transport, distribution, food services, as well as other services-dominated businesses. Also called services sector, tertiary sector of industry

Consumers

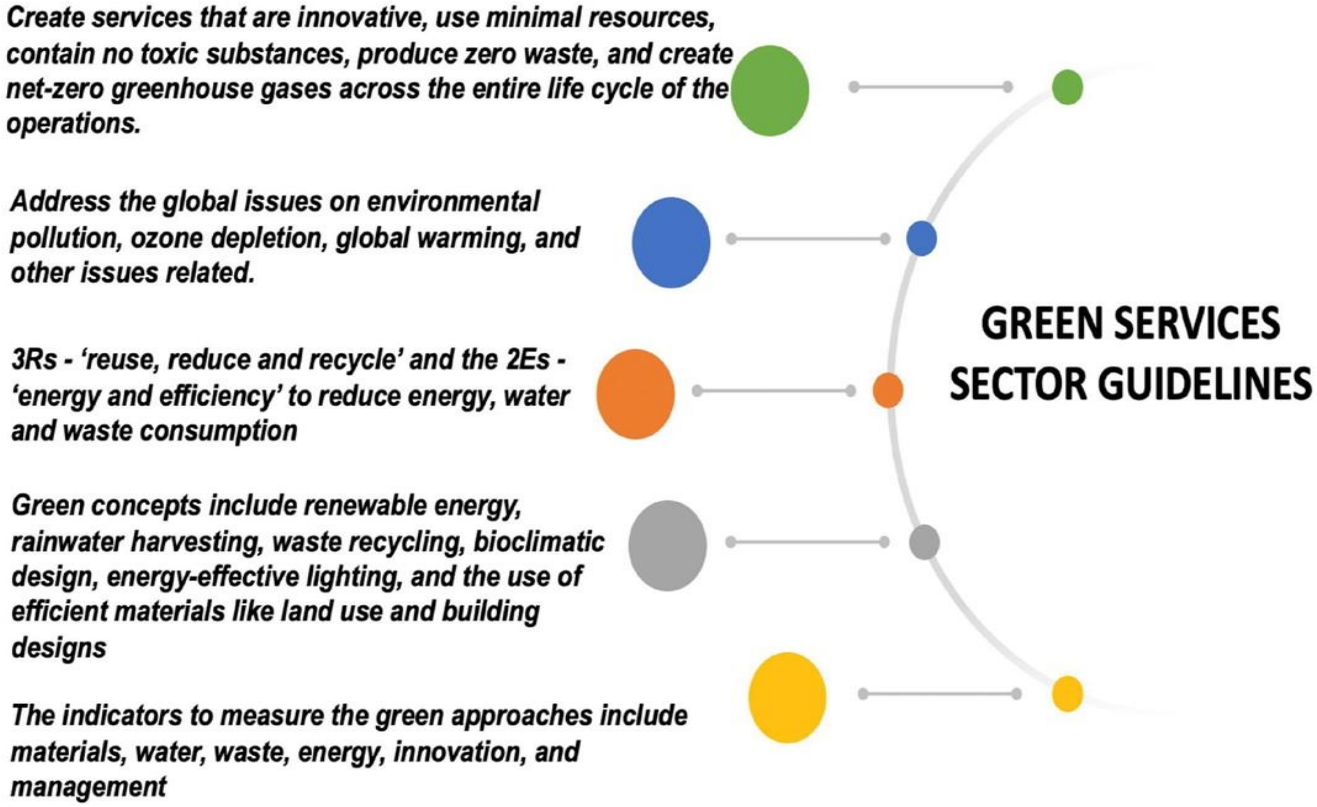
- Individuals or organisations that purchase and exchange a product or services or value to satisfy their needs.

PART III

GREEN SERVICES SECTOR

PART III: GREEN SERVICES SECTOR

3.1 Introduction



General recommendations are made to enable applicability across these industries while maintaining the general aim which focuses on implementing green practices in the services industry namely the tourism and travel-related services.

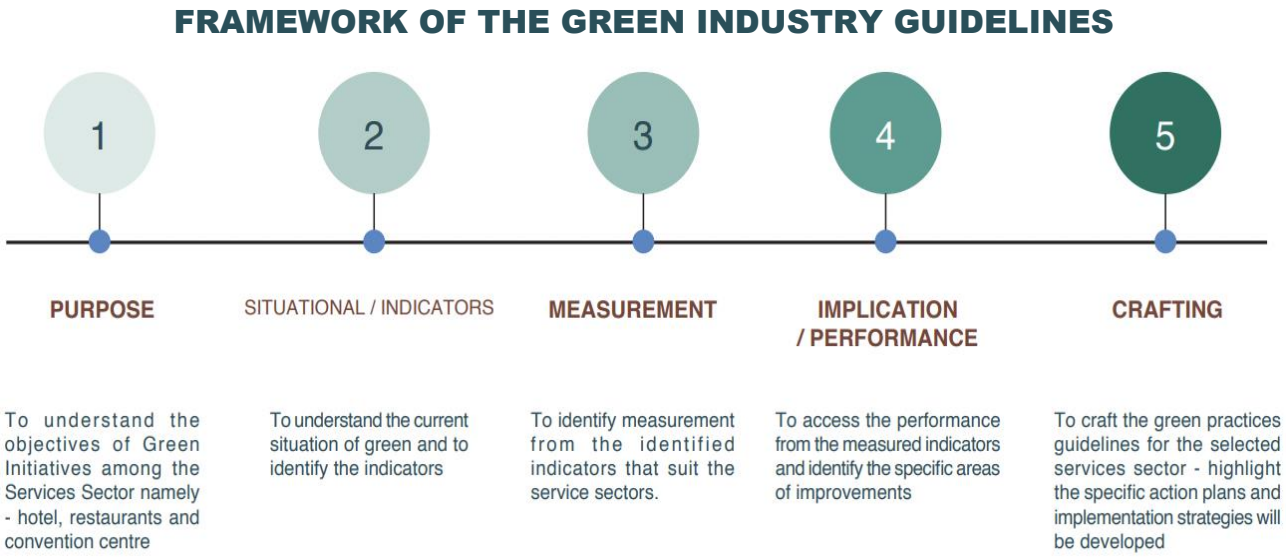


Figure 3.1: The five recommended steps for services industry aiming to implement this guideline

Due to the nature of the services sector in Malaysia, therefore this tool should not be considered a tool that best fits all. It should also be reminded that the list is exhaustive and expansive.

The next section comprises six (6) indicators outlined, formed by several sub-indicators. While establishing the indicators for the green practice in the services sector, strategies and plans should be laid out to ensure initiatives and efforts carried out should meet or exceed the standards as per the sub-indicator. Hence, this subsection shall elaborate and expound further generally on the proposed actions and plans. This, however, should not be the sole guideline but not be limited to the application and synthesizing other strategies from international, governmental, and non-governmental organizations into meeting the requirements of the indicators.

3.2 General Indicators, Assessment and Methodology

The next step is to carry out a thorough environmental review of the operations of the organizations. Organizations must be able to address the main environmental impacts produced by them, and concurrently they are able to identify the indicators which are significant for them to assess and find the opportunities to reduce them. In general, the indicators are shown below:

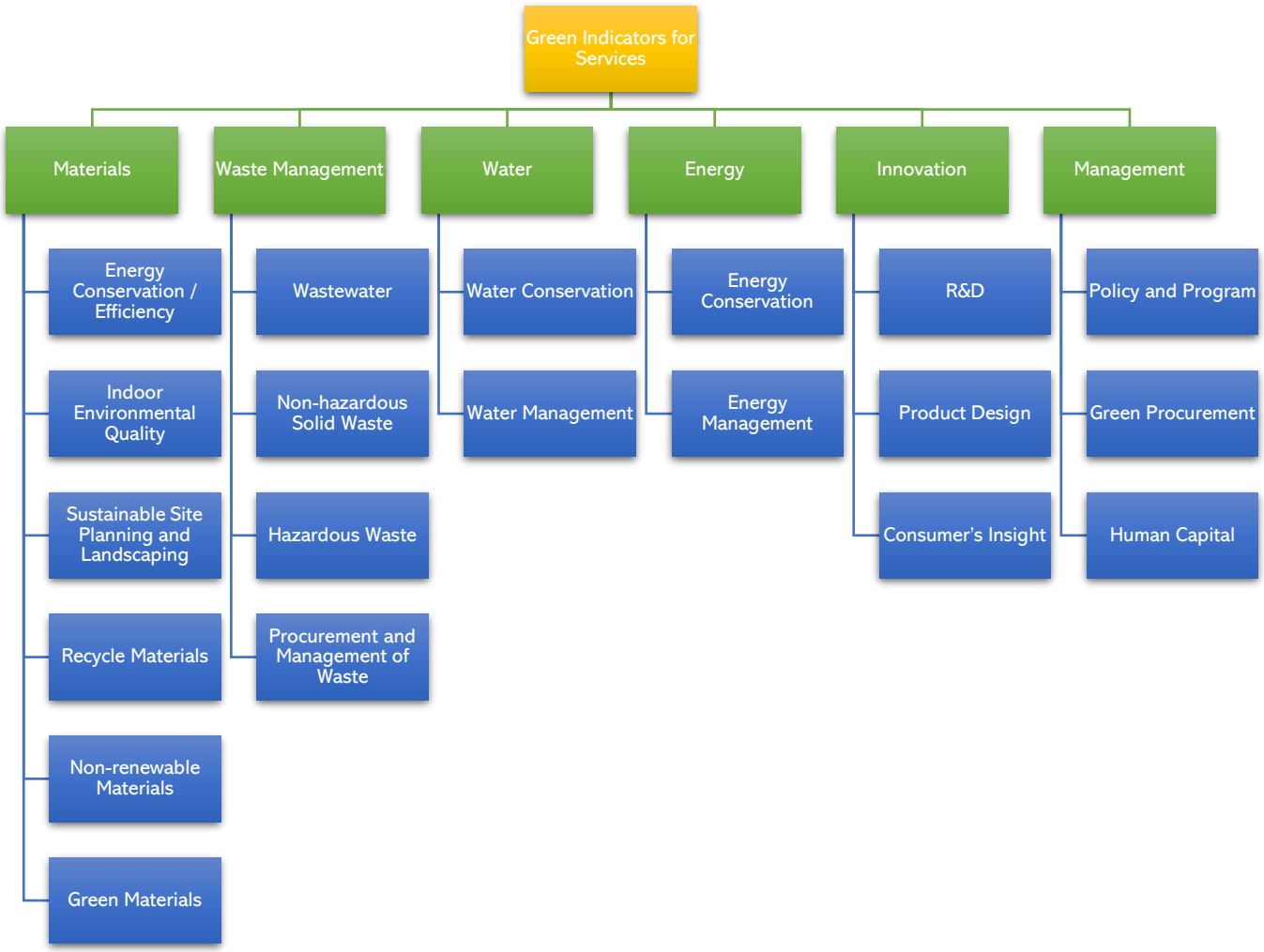


Figure 3.2: The Green Indicators for Services Sector

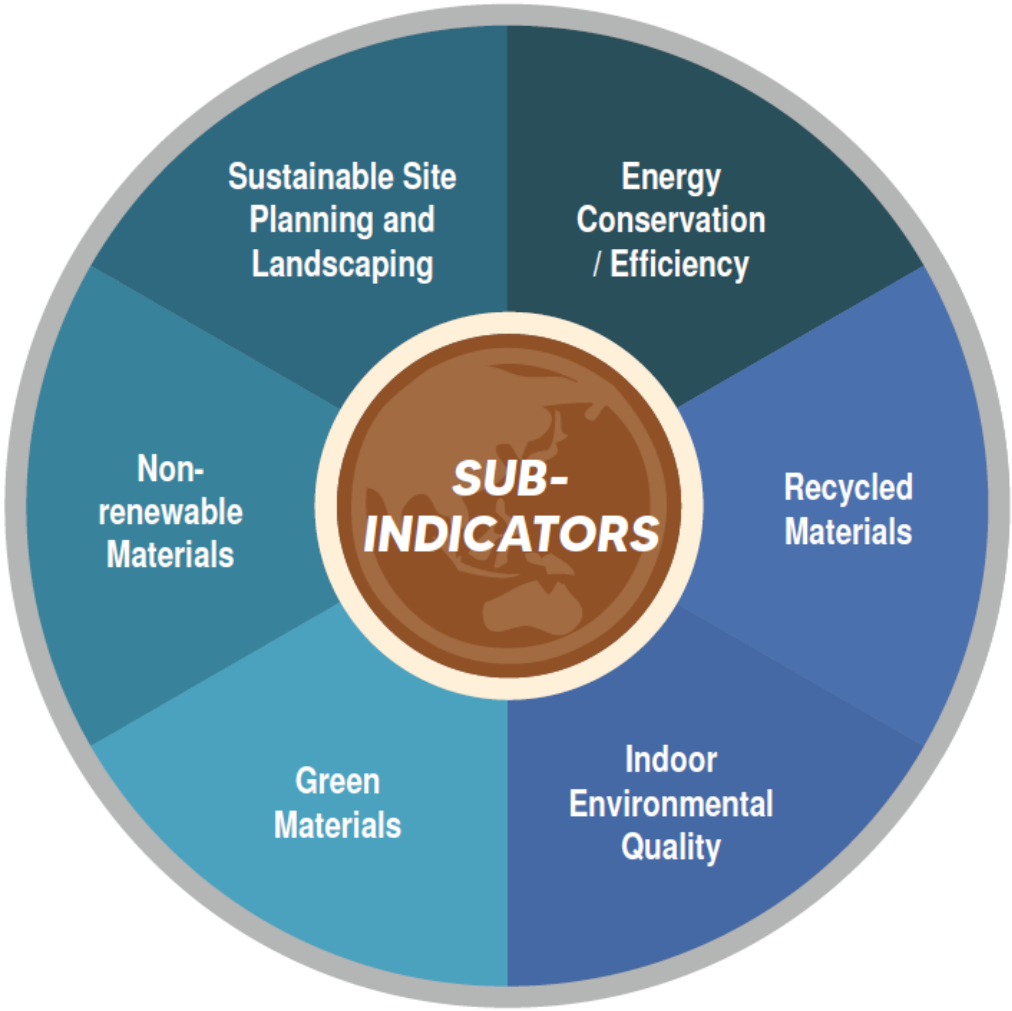
WHAT ARE MATERIALS?

The services sector uses various types of materials in their daily operation, and they are required to use virgin materials as well as utilize recycled materials. Long-term survival for this industry depends on the efficient consumption of materials. This is linked with the availability of natural resources and achieving high material efficiency is highly recommended. The services sector has programs such as redecoration, changing lighting, and services, or refurbishing whole floors, and upgrading major items of the plant. Often systems are replaced on a like-for-like basis, but refurbishment presents an excellent opportunity to increase energy efficiency as well as introduce other environmental improvements. When selecting materials, products, and equipment for the service operation, environmental criteria should be given equal consideration alongside issues such as appearance and performance. The cost of choosing an energy-efficient or environmentally preferable option is often marginal, while the benefits of doing so will accrue over many years. The materials for the services sector include friendly land use and building designs. Materials, buildings, and products that comply with any green building indexes and certifications should be of main priority as these materials can contribute to lower consumption of resources e.g., water and energy. Land and building owners should plan and discuss with the developers on adhering to the stringent standards before occupancy.

TARGET: To ensure the utilized materials would be able to produce fewer wastes in the operations of the services sector and the materials could be recycled and reused to increase the material-efficient processes so that material wastes could be reduced by 50% by 2030.

GUIDING PRINCIPLES

The aim is to outline the scopes preferably during the selection of materials, building, and landscaping before the operation of a business (concerning several green construction rating systems for NRNC and NREB). For materials, it is pertinent for the services sector to identify the sub-indicators which reflect the practices of the organizations. The scope of materials includes (6) sub-indicators:



Sub-Indicators for

Materials

The overall target setting and strategic plans for the indicators of materials are summarised in the snapshots of the strategic approach in Figure 3.3.

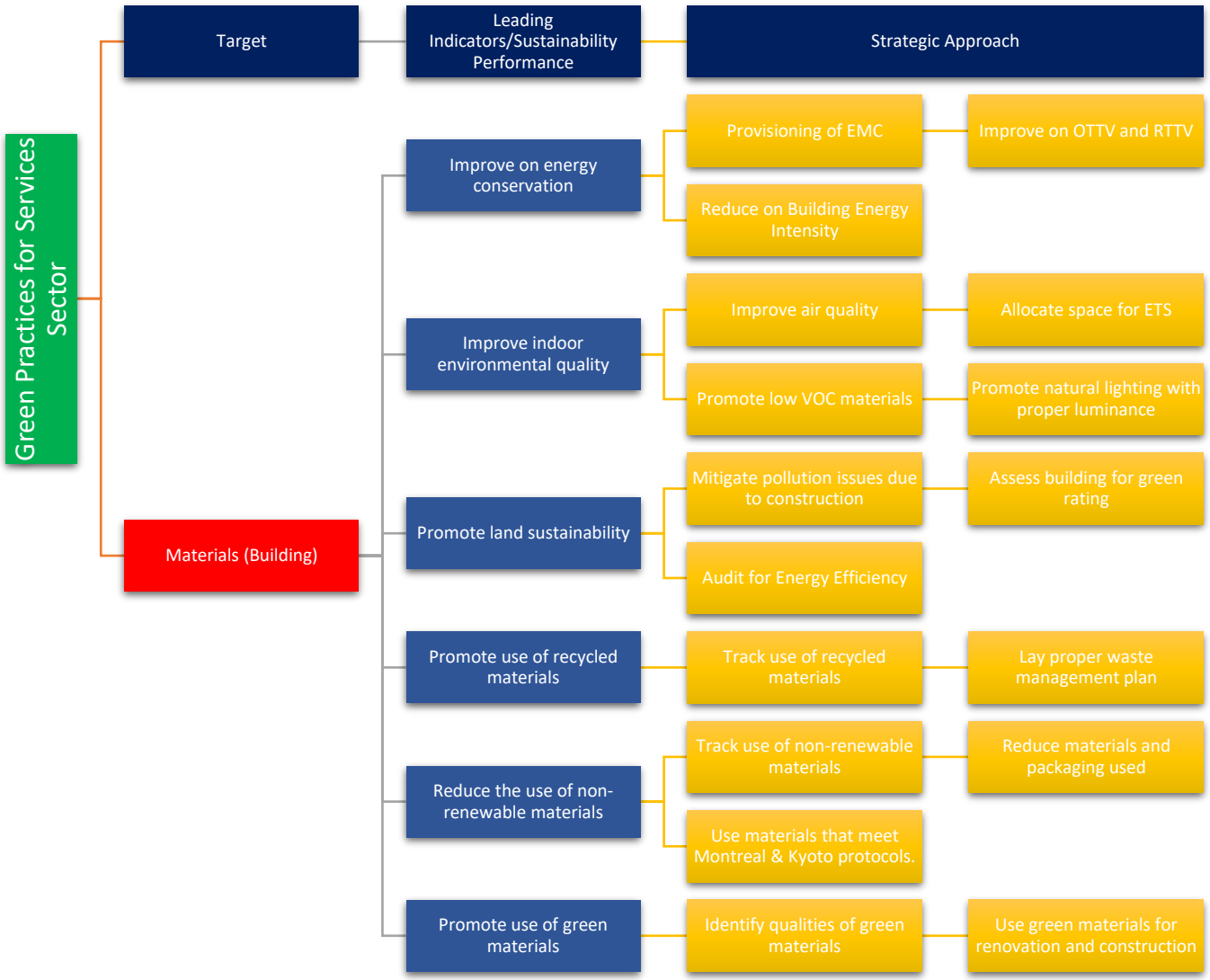


Figure 3.3: The Green Indicators for Services Sector

Based on Figure 3.3, a detailed explanation for the sub-indicators is listed in Table 3.1.

Table 3.1: Sub-indicators for Materials

Green Practices Sub-Indicators	
1	**Energy Conservation and Efficiency**
	• More energy-efficient and meets minimum EE requirements. • Better controls, including building automation systems and efficient building services: - OTTV ≤ 50, RTTV ≤ 25. - Provision of Energy Management Control system where Air-conditioned space - ≥ 4000m2 / Install Energy Management Control system • Achieve Building Energy Intensity (BEI) ≤ 150 kWh/m2 annually - Ensure the building's energy-related systems will continue to perform as intended beyond the 12 months Defects & Liability Period (for NC) OR - Ensure the building's energy-related systems will continue to perform as intended with proper and sustainable maintenance. (for EB)
2	**Indoor Environmental Quality**
	• Indoor air quality should meet the minimum requirements of ventilation rate in ASHRAE 62.1:2007 or the local building code whichever is the more stringent. • Minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to Environmental Tobacco Smoke (ETS). • Ensure independent control of ventilation rates to maintain CO2 level ≤ 1,000ppm via a CO^2 sensor • Use low VOC materials throughout the building • Indoor air humidity to be no more than 70% RH. • Ensure a high level of thermal comfort system control and achieve an Air Change Effectiveness (ACE) of ≥ 0.95. • Ensure good lighting and proper luminance for workspace and ergonomics. • Maintain internal noise levels at an appropriate level.
3	**Sustainable Site Planning and Landscaping**
	• The selection of sites should not endanger local communities and habitats for floraand fauna. (NC) • Check for Energy Efficient Audit should the building have been approved under any Green Rating system. (EB). • Conserve existing natural areas and restore the damaged area to provide habitatand promote biodiversity. • Reduce pollution from construction activities. (NC & EB). • Reduce heat island. • Reduce or eliminate water pollution. • Reduce pollution and land development impacts from automobile use. • Document Green building design features and strategies for user information and guide to sustain performance during occupancy. • Employ environmentally sensitive management to preserve the site's natural

	components. (EB) • Careful attention to planting to provide natural protection from the elements.
4	**Recycled materials**
	• Reuse building materials and products. • Increase demand for building products that incorporate recycled content materials in their production • Use local building materials and products • Develop and implement a waste management plan • Use environmentally friendly Refrigerants and Clean Agents
5	**Non-renewable materials**
	• Incorporate the use of materials that are renewable, recyclable, and/or recycled • Reducing the use of materials that require high energy consumption • Design products that reduce material use.
6	**Green Materials**
	• Promote the use of green materials – local and renewable. • Replace construction materials for buildings.

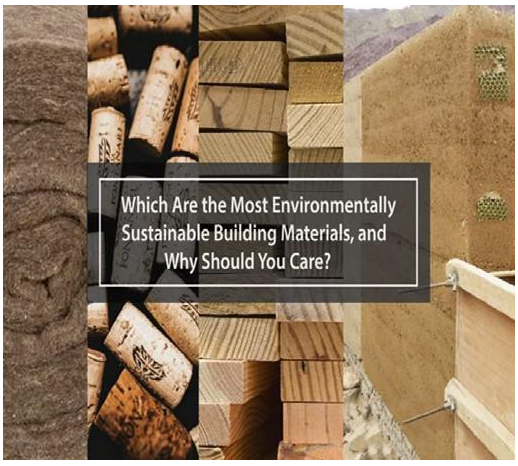




METHODOLOGY OF THE INDICATORS

To understand further, each of the sub-indicators needs to be operationalized for easy interpretation. The explanation and the examples are explained below.

1. Energy Conservation and Efficiency (The material used must be efficient and use eco-building materials)



No	Description
1	An energy-efficient building should meet the Malaysian Standard 1525:2007 whereby the overall thermal transfer value (OTTV) should not exceed the value of 50 and the Roof Thermal Transfer Value (RTTV) should not exceed 25. These values can be calculated using the BEIT software or other GBI-approved software(s). Further, it is also compulsory to install an Energy Management Control system in both new constructions (NC) and existing buildings (EB).
2	As for the Building Energy Intensity (BEI), it should not exceed 150 kWh/m2 peryear. The formula of the calculation can be found below: $BEI\ (kWh/m^2/year) = \frac{Annual\ Energy\ Consumption\ (kWh)}{NFA\ (m^2)}$
3	Relatively, lower BEI indicates low consumption of energy hence contributing to a greener environment. In addition, renewable energy is highly encouraged. This includes the usage of solar panels.
4	A newly constructed building should be monitored so that the energy systems installedshould perform as intended beyond the 12 months Defect & Liability Period. As for the existing building, equipment and related systems should be properly maintained forsustenance and prolonged lifespan.

2. Indoor Environmental Quality

No	Description
1	Occupying the space indoors can be uncomfortable due to long hours of exposure to poor air quality. Hence, stringent quality control should be adhered to promote ergonomic working conditions as well as better well-being of the occupants. As such, the air quality indoors should meet the minimum requirements as per stipulatedin ASHRAE 62. 1:2007 or local building code, whichever is the more stringent.
2	As for the environmental tobacco smoke (ETS), there are two proposed measures: • Option 1 - Prohibit smoking in the building. Locate any exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes, and operable windows. • Option 2 - Prohibit smoking in the building except in designated smoking areas.Locate any exterior designated smoking areas at least 25 feet away from entries,outdoor air intakes, and operable windows. Locate designated smoking roomsto effectively contain, capture and remove ETS from the building.
3	In prioritizing the health of the occupant, materials used for the entire building such as paint, carpet, and sealants, should contain a low amount of volatile organic compounds (VOCs), such as acetone, formaldehyde, and butanol, which lead to indoor air pollution. Air Change Effectiveness should be at least 0.95.
4	In prioritizing the health of the occupant, materials used for the entire building such as paint, carpet, and sealants, should contain a low amount of volatile organic compounds (VOCs), such as acetone, formaldehyde, and butanol, which lead toindoor air pollution.
5	Good lighting and proper luminance are crucial in ensuring an ergonomic workspace. Providing flexible control over lighting is also a measure to reduce electricity wastage. Daylighting could be put to good use in reducing the usage of electricity. As per the Green Building Index requirement, the Net Lettable Area (NLA) should exceed 30%, with the daylight factor in the range of 1.0 – 3.5% as measured at the workingplane, 800mm from floor level. Other measures may include installing high-frequency ballasts in fluorescent luminaires over a minimum of 90% of NLA and include flexible lighting control.

3. Sustainable Site Planning and Landscaping

No	Description
1	As for new building construction, the site should be wisely selected to not risk the local communities and the habitats of flora and fauna, besides other criteria as recommended by GBI. Before occupying existing buildings for operation, building conditions should be inspected, should the building have been approved under any Green Rating system and conducted a comprehensive Energy Efficient Audit within the last 12 months.
2	Pollution caused by construction, or any relevant activities can be reduced by controlling soil erosion, waterway sedimentation, and airborne dust generation, besides waste and rubbish from workers.
3	The maintenance of the natural components surrounding the site should be environmentally sensitive and managed. This can be done by minimizing the use of chemicals or use in targeted areas only.
4	Heat island, which is the thermal gradient difference between developed and undeveloped areas, should be reduced via hardscape and greenery besides roof application.

4. Recycled Materials

<table>
<tr><th>No</th><th>Description</th></tr>
<tr><td>1</td><td>Demand for virgin materials should be reduced in the materials used for the construction and operation of the business. This leads to lesser waste creation and the betterment of the environment. Operators should be made aware of the impact of using virgin materials as the draining of more resources along the supply chain.</td></tr>
<tr><td>2</td><td>One indicator to measure would be the number of recycled materials or productsused in the total amount spent on materials. Further, locally sourced products shouldfacilitate a further reduction of waste besides supporting local businesses. As such, the high demand for recycled materials in the near region will encourage manufacturers to pursue a business model that is more environmentally friendly. The calculation for the estimation of expenditure on recycled materials or products is as below:
$$\frac{Estimation\ of\ recycled\ materials\ used\ in\ products\ (tonne)}{Total\ materials\ purchased\ (tonne)} = \%$$
<table>
<tr><td>Department:</td><td colspan="4">Kitchen</td></tr>
<tr><td>Year:</td><td colspan="4">2021</td></tr>
<tr><td>Purchases</td><td>Previous year (%)</td><td>Current year (%)</td><td>Target (%)</td><td>Achieved Target (Y/N)</td></tr>
<tr><td>Recycled Materials</td><td>30</td><td>40</td><td>50</td><td>N</td></tr>
<tr><td colspan="3"></td><td>Total targets achieved (%):</td><td>0%</td></tr>
</table></td></tr>
<tr><td>3</td><td>Waste management plans, applicable to both construction and operation of the business are crucial. A waste tracking system could be implemented throughout the construction or operation of the business to monitor the amount of waste created.
<table>
<tr><th colspan="9">Example of Waste Tracking Template</th></tr>
<tr><td colspan="9">Tracking waste from its point of generation to its final disposition can be done using a simple spreadsheet.</td></tr>
<tr><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td><td>I</td></tr>
<tr><td>Point of Generation</td><td>Date</td><td>Waste Type</td><td>WM Staging Area</td><td>Amount Managed</td><td>Cumulative Amount Managed</td><td>Units</td><td>Waste Management Facility</td><td>Comments</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
</table>

5. Non-renewable Materials

<table>
<tr><th>No</th><th>Description</th></tr>
<tr><td>1</td><td>Non-renewable materials have been heavily depended on; especially fossil fuelssuch as petrol and diesel. Though these are used for combustion and incinerationpurposes, the replacement of these materials can be costly or scarcely available.One good example would be the use of solar panels which is costly and reliant onseveral factors to replace cheap and readily available electricity that comes from the burning of coal. Business operators may weigh in the pros and cons of optingalternative resources but are primarily concerned with the cost. Nevertheless, optionsof using renewable, recyclable, and recycled materials are highly encouraged.</td></tr>
<tr><td>2</td><td>The lifespan of non-renewable materials should be extended. This includes higher quality components and higher quality control in the manufacturing process.For instance, a higher quality diaper can absorb twice or more the capacity of thelesser competitors may only require slightly if not equal the amount of energy used inthe manufacturing process.</td></tr>
<tr><td>3</td><td>The usage of the non-renewable materials can be measured by tonnes of usageper year, whereby organizations and operators can document and compare on a year-to-year basis.
<table>
<tr><td>Department:</td><td colspan="4">Kitchen</td></tr>
<tr><td>Year:</td><td colspan="4">2021</td></tr>
<tr><td>Purchases</td><td>Previous year (%)</td><td>Current year (%)</td><td>Target (%)</td><td>Achieved Target (Y/N)</td></tr>
<tr><td>LPG</td><td>90</td><td>80</td><td>80</td><td>Y</td></tr>
<tr><td colspan="4">Total targets achieved (%):</td><td>100%</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>No</th><th>Description</th></tr>
<tr><td>4</td><td>Certain materials may require higher energy during their manufacturing process hence it is essential to identify the material used. As a result, it may equate to high operating costs. For instance, a stainless-steel product (100+ GJ/ton) requires half of the energy required by aluminum (200+ GJ/ton).
<table>
<tr><th>Material</th><th>Primary energy requirement (GJ/ton)</th></tr>
<tr><td>Very-high-energy</td><td></td></tr>
<tr><td>Aluminium</td><td>200-250</td></tr>
<tr><td>Plastics</td><td>50-100</td></tr>
<tr><td>Copper</td><td>100 +</td></tr>
<tr><td>Stainless steel</td><td>100 +</td></tr>
<tr><td>High-energy</td><td></td></tr>
<tr><td>Steel</td><td>30-60</td></tr>
<tr><td>Lead, zinc</td><td>25+</td></tr>
<tr><td>Glass</td><td>12.25</td></tr>
<tr><td>Cement</td><td>5.8</td></tr>
<tr><td>Plasterboard</td><td>8.10</td></tr>
<tr><td>Medium-energy</td><td></td></tr>
<tr><td>Lime</td><td>3-5</td></tr>
<tr><td>Clay bricks and tiles</td><td>2-7</td></tr>
<tr><td>Gypsum plaster</td><td>1-4</td></tr>
<tr><td>Concrete:</td><td></td></tr>
<tr><td>In situ</td><td>0.8-1.5</td></tr>
<tr><td>Blocks</td><td>0.8-3.5</td></tr>
<tr><td>Precast</td><td>1.5-8</td></tr>
<tr><td>Sand-lime bricks</td><td>0.8-1.2</td></tr>
<tr><td>Timber</td><td>0.1-5</td></tr>
<tr><td>Low energy</td><td></td></tr>
<tr><td>Sand, aggregate</td><td><0.5</td></tr>
<tr><td>Flyash, THA, volcanic ash</td><td><0.5</td></tr>
<tr><td>Soil</td><td><0.5</td></tr>
</table></td></tr>
<tr><td>5</td><td>Products can also be designed where the material and packaging can be reduced.The use of modular parts or standardizing size and usage can lead to reduced material usage and raw material. For instance, the thread of a bottle can be interchangeable with other caps from other manufacturers across the globe.</td></tr>
<tr><td>6</td><td>In support of being environmentally friendly, cleaning agents and refrigerants specifications should exceed the requirements of the Montreal & Kyoto protocols. This includes phasing out the use of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) materials and the commitment to reduce greenhouse gas emissions in protecting the ozone layer. Therefore, environmentally friendly refrigerants that contain hydrofluorocarbons (HFC) and hydro fluoro-olefins (HFO) such as R32, R134a, R404a, R290, and R600a. This does not only promote lower energy consumption but also has better thermodynamic efficiency where temperatures can recover quickly.</td></tr>
</table>

6. Green Materials

No	Description
1	Synonymous in the construction industry, green materials are known to be local and renewable. Green materials are defined as environmentally responsible materials because their effects are considered throughout the life of the material. According to Greenguide's definition, green products and materials must meet atleast one of the following criteria: • Long service life • Non-toxic • Has recycled content • Saving resources • Interested in the environment
2	Being local, green materials tend to be unique as it can represent the identityof the local community. Further, these materials are closest to the environment while being reclaimable from their existing form, recyclable and non-toxic. Thesematerials are also very efficient as they are durable, plentiful, with minimal chemicalemissions and low on VOC. As they use lesser resources, therefore, they are often cheaper to manufacture as compared to their counterparts.
3	Examples of green materials are such as bamboo, sandbag, natural fiber, glass fibers, terrazzo, and wood.

ASSESSMENT AND EVALUATION

Organizations need to understand the specific tool to assess and evaluate their performance on the indicators that serve as a guideline for them to control their damage to the environment. The suggested tool for material is shown below:

A. Materials (Buildings, Refurbishment, and Landscaping)	
1. Energy Efficient	
1	Provisioning and availability of Energy Management Control system (NC & EB)
2	Inspect OTTV & RTTV - Current year value - _____ - Previous year value - _____
3	Record Building Energy Intensity (BEI) (NC & EB) - Current year value - _____ - Previous year value - _____
4a	Building's energy-related systems will continue to perform as intended beyond the 12 months Defects & Liability Period (for NC) -OR-
4b	Building's energy-related systems will continue to perform as intended with proper and sustainable maintenance. (for EB)
2. Indoor Environmental Quality	
1	Are you satisfied with the indoor air quality of your establishment?
2	Have you made any changes to the environment/surroundings to improve your indoor air quality?
3	Do you allocate space for environmental tobacco smoke (ETS)?
4	Are you satisfied with the air change/airflow of your establishment?
5	Have you made any changes to the environment/surroundings to improve your air change/airflow?
6	Are you satisfied with the air change/airflow of your establishment?
7	Have you made any changes to the environment/surroundings to improve your air change/airflow?
8	Do you use low VOC materials throughout the building?
9	Are you satisfied with the air humidity of your establishment?
10	Have you made any changes to the environment/surroundings to improve your air humidity?
11	Proper lighting and luminance for workspace and ergonomics.
12	Can daylight provide enough lighting to work during the day?

3. Sustainable Site Planning and Landscaping	
1	The building has been approved under any Green Rating system.
2	The building has been assessed for a comprehensive Energy Efficient Audit within the last 12 months.
3	Managing pollution caused by construction or any related activities.
4a	Documenting Green building design features and strategies for user information and guidance.
4. Recycled Materials	
1	Percentage of recycled materials or products purchased in the total amount spent. - Target - _____ % - Current year value - _____% - Previous year value - _____%
2	Recycle materials management plan is clear and concise.
3	Recycle materials tracking system has been implemented.
5. Non-Renewable Materials	
1	Non-renewable materials used in the premise are documented.
2	Percentage of non-renewable materials or products purchased in the total amount spent. - Target - _____ % - Current year value - _____% - Previous year value - _____%
3	Minimize materials and packaging used.
4	All cleaning agents and refrigerants meet the requirements of the Montreal & Kyoto protocols.
6. Green Materials	
1	Use of green materials for construction and renovation at premise.

WHAT ARE WASTE?

Waste is the discarded material from an activity that is no longer useful or required. Waste comes in many forms and can present different environmental risks based on the chemical makeup and physical state of the materials. In green practices, the strategy and approach are different from end-of-pipe treatment as it focuses on prevention or reduction of waste at source.

TARGET: To ensure the wastes generated from the services operations not only could be reduced, but also could minimise the impact of the hazardous emissions such as greenhouse gases methane (CH^4), ammonia (NH^3), hydrogen (H^2S), odours and other undesirable emissions. The target for Waste Treatment and Disposal by 2030 is 28% of recycling rate. Additionally, Wastewater treatment is 100% (sludges to be recycled) and 33% treated effluent to be recycled as stated by Green Technology Master Plan Malaysia 2017-2030.

REDUCE	RECOVER	REUSE	RECYCLE
The best way to improve waste management is to create as little waste as possible by not purchasing it, to begin with.	Set up systems to collect and sort the waste so that it can be reused or recycled.	Set up systems to collect and sort the waste so that it can be reused or recycled.	Set up system in place for sorting and collecting everyday waste items such as bottles, cans, cardboard, and paper for reuse or recycling. Have you considered all the waste you generate and what else might be recycled? What happens to your used batteries, plastic bottles, wine corks, bathroom amenities, or cooking oil for example?

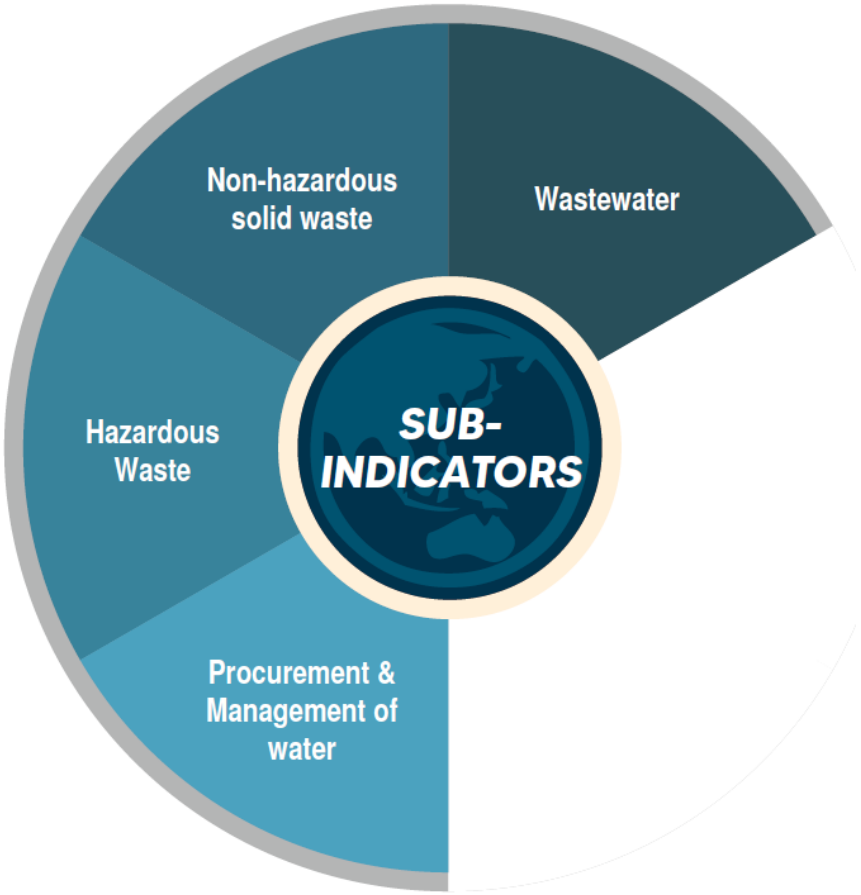
GUIDING PRINCIPLES

Managing waste and disposables form is crucial in mitigating environmental footprints. The recycling practice, though increasing over the past few years, the amount of waste generated is a concern. Waste is also a by-product a result of affluent lifestyles where people with smaller purchasing power in underdeveloped countries forced them to reuse the waste. At the scale of population growth in huge countries such as China and India, the effect of waste on the well-being of humans is apparent. Therefore, actions must be taken especially in the food and beverage, tourism, and hospitality industries.

Waste can be generally defined in Section 2 of the Environmental Quality Act 1974 (Act 127) and Regulations (EQA194) which states, "Waste includes any matter prescribed to be scheduled wastes or any matter whether in a solid, semi-solid or liquid form or in the form of gas or vapor which is emitted, discharged or deposited in the environment in such volume, composition or manner as to cause pollution."

Therefore, in achieving green standards, reducing waste and resources would be the utmost desirable goal. While disposal can be an easy way out, reducing is relatively more significant in contributing to lower carbon emissions and footprint as fewer materials and products are used. Industrial waste is substances that are solid or non-solid, organic, or non-organic or substances in any state that are produced directly or indirectly from any industrial activity as by-products.

It is important to identify the sub-indicators for waste management. The scope of waste management includes five main sub-indicators. Each of the indicators is shown below:



Sub-Indicators for

Waste Management

The overall targets setting and strategic plans for the indicators of waste management are summarised in the snapshots of the strategic approach in Figure 3.4.

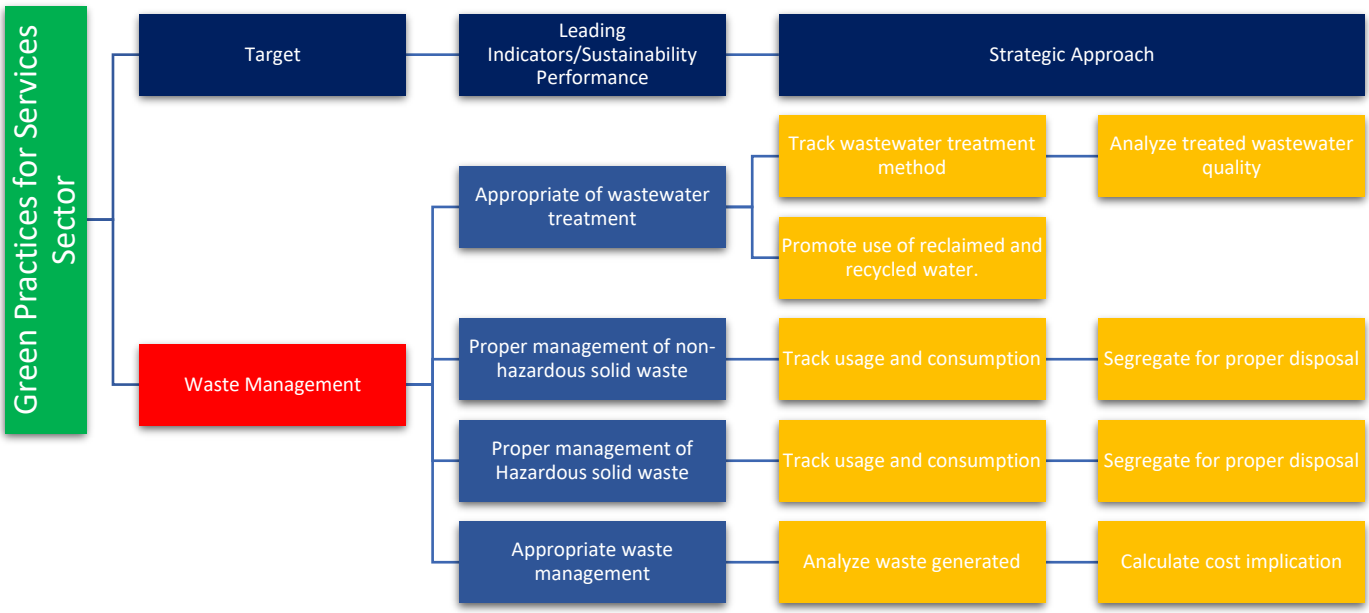


Figure 3.4 Summary of Targets, Indicators and Strategic Approach of Waste Management

Table 3.1: Sub-indicators for Waste Management

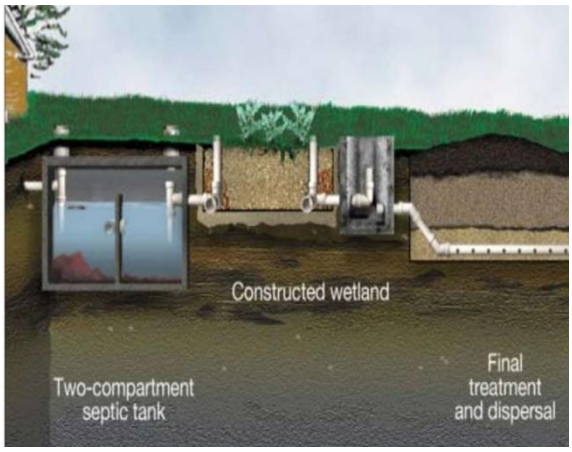
Green Practices Sub-Indicators	
1	**Wastewater**
	• Wastewater is a type of water that has been used at any stage of the industrial process. The impacts include: • The wastewater may contain various substances and toxic materials which must be treated before it can be released into water bodies. • Environmental impact of untreated effluent. • Incorporating green technology into the existing treatment process • Increasing the use of recycled water for processes that do not require a high-quality water.
2	**Non-hazardous Solid Waste**
	• Non-hazardous solid waste is a type of waste that include different kinds of materials such as paper, plastic, wood, packaging materials, scrap metals, and every other solid waste that can no longer fulfill its intended purposes. The increases the amount of solid waste which will eventually end up in landfills causing many environmental problems. • Enhance the 3R's concept among staff and workers • Reducing the use of auxiliary materials for packaging enables less waste to be produced • Select materials that are durable and reusable • Select materials and products that are made of recycled materials • Select materials and products that can be renewable • Bulk purchase of products to reduce cost and packaging
3	**Hazardous Waste**
	• Hazardous waste is a waste that is listed as a known hazardous waste or meets the characteristics of hazardous waste. These are those that exhibit any one or more of the following characteristic properties: ignitability, corrosivity, reactivity, or toxicity. The impacts of include: • Decrease hazardous emissions from the incineration process. • Hazardous waste treatment is costly. • Stimulate safer incineration by concentrating toxic materials and providing easy removal • Opt for less hazardous chemical processes whenever practicable

4	Procurement and Management of Waste
	• Negotiate with suppliers on materials and packaging used • Select products and packaging made from recycled and recyclable material • Identify lifecycle of product prior to procuring • Practise partnerships with relevant sectors or businesses on products • Develop waste inventory and identify options • Facilities for back-of-house waste management • Train staff on waste management

METHODOLOGY OF THE INDICATORS

To understand further, each of the sub-indicators needs to be operationalized for easy interpretation. The explanation and the examples are explained below.

1. Wastewater



<table>
<tr><th>No</th><th>Description</th></tr>
<tr><td>1</td><td>The treatment of wastewater could harm the environment as chemicals used can lead to the formation of more solid waste from the water, which results in higher-cost production and more environmental problems.
It is recommended that wastewater should be treated using the electrocoagulation method.</td></tr>
<tr><td>2</td><td>While such a method is claimed to be green and environmentally friendly, the Act 508: Sewerage Services Act 1993 mandated that the Federal Government is held responsible for the sewage management system nationwide. The current treatment of wastewater by IndahWater Konsortium (IWK) should be in line withthe Green Technology Masterplan (2017-2030).</td></tr>
<tr><td>3</td><td>The management of the business should monitor the Biochemical Oxygen Demand (BOD) level periodically as part of managing wastewater. Samples collected can be sent to local labs for screening. While a wastewater treatment system can be installed on the premise, several treatment methods can be observed:
• Primary treatment – large debris such as wood sticks and sludge are removed appropriately. e.g., via septic tanks and composting toilets.
• Secondary treatment – mainly to reduce other solids via natural wastewater treatment or submerged aerated filters.
• Tertiary treatment – removal of harmful organisms via various methods of filtration. e.g., sand filtration, ultraviolet disinfection, chlorination.</td></tr>
<tr><td>4</td><td>One of the best practices of wastewater treatment is done by Four Seasons Chiang Mai where water from the treatment plant is then channeled to a local rice field.

Sample of wastewater should adhere to the guideline below:

<table>
<tr><th>Pollutant</th><th>Unit</th><th>Guideline Value</th></tr>
<tr><td>pH</td><td>pH</td><td>6-9</td></tr>
<tr><td>BOD (Biochemical Oxygen Demand)</td><td>mg/l</td><td>30</td></tr>
<tr><td>COD</td><td>mg/l</td><td>125</td></tr>
<tr><td>Total nitrogen</td><td>mg/l</td><td>10</td></tr>
<tr><td>Total phosphorus</td><td>mg/l</td><td>2</td></tr>
<tr><td>Oil and grease</td><td>mg/l</td><td>10</td></tr>
<tr><td>Total suspended solids</td><td>mg/l</td><td>50</td></tr>
<tr><td>Total coliform bacteria</td><td>MPN/100ml</td><td>400</td></tr>
<tr><td>Temperature increase</td><td>°C</td><td>≤ 3</td></tr>
<tr><td>Total residual chlorine</td><td>mg/l</td><td>0.2</td></tr>
</table>
Source: International Finance Corporation Environmental, Health, And Safety(EHS) Guidelines April 2007; Wastewater and Ambient Water Quality and World Bank Pollution Prevention and Abatement Handbook 1998

It is highly recommended that water should be recycled or reclaimed. Recycled water refers to treated wastewater that has been used more than once, which is channeled to a treatment plant. Reclaimed water, on the other hand, has not been reused or recycled that is recaptured and reused within a building. For instance, a rainwater collection system can be used for public toilets, or wastewater from laundry can be used to water decorative plants.</td></tr>
</table>

2. Non-hazardous Solid Waste

No	Description
1	Managing solid waste is essential as blooming businesses can translate to an increasing amount of waste. With the increasing population and better purchasing power due to the desire for a better lifestyle, the demand for more products increases over time, leading to the inevitable concern of minimizing and managing waste.
2	The reduction should be of the highest priority as this leads to lesser materials used, while recycling involves several other resources, and reusing of materials may lead to more replacements due to tear and wear. It is important to identify and segregate solid waste for proper disposal. A collection of waste can be recorded accordingly to its category.

Department:							
Types of Waste	Approx. Weight	Current disposal method	Cost (A)	Action	Proposed method	Cost (B)	Total savings (A-B)

3. Hazardous Waste

No	Description
1	While certain waste can be hazardous, the disposal technique must be carried out appropriately. Waste should be identified accordingly before storing in approved containers. The containers should be properly labeled.
2	A log should be maintained to record the amount of hazardous waste generated and to trace the origin of the waste.
3	Relevant parties or business operators should be made aware of the hazardouswaste generated and consider other alternatives to replace hazardous waste.

Department:							
Types of Waste	Approx. Weight	Current disposal method	Cost (A)	Action	Proposed method	Cost (B)	Total savings (A-B)

4. Procurement and Management of Waste

No	Description
1	A common practice that should be further enforced is the 3R concept where staff and workers are trained to identify types of waste and how to manage it. Materials and packaging used can be decided where negotiation and partnerships can play important role in saving cost and the environment. Packaging design can be made reusable or returnable to prevent additional waste that leads to higher costs.
2	Operators can negotiate with suppliers on the type and quality of materials and packaging used; to benefit both parties. Committing to green practice is a collaborative effort. For instance, liquids are transported in large containers instead of individual packing. Partnerships with other businesses allow merged orders to cut redundant expenditures.
3	A few tips that can be considered before handling waste at the managerial level: • Review the materials used in your premise • Use a checklist to identify all products used and categorize them accordingly. (Reduce, Reuse, Recycle, Replace) • Conduct monitoring and benchmarking of the current and proposed practice • Propose a recycling coordination team and carry out independent waste auditing. • Compare Y-o-Y waste generated and implication of cost. • Conduct periodical training for staff on waste management.

ASSESSMENT AND EVALUATION

Organizations need to understand the specific tool to assess and evaluate their performance on the indicators that serve as a guideline for them to control their damage to the environment. The suggested tool for material is shown below:

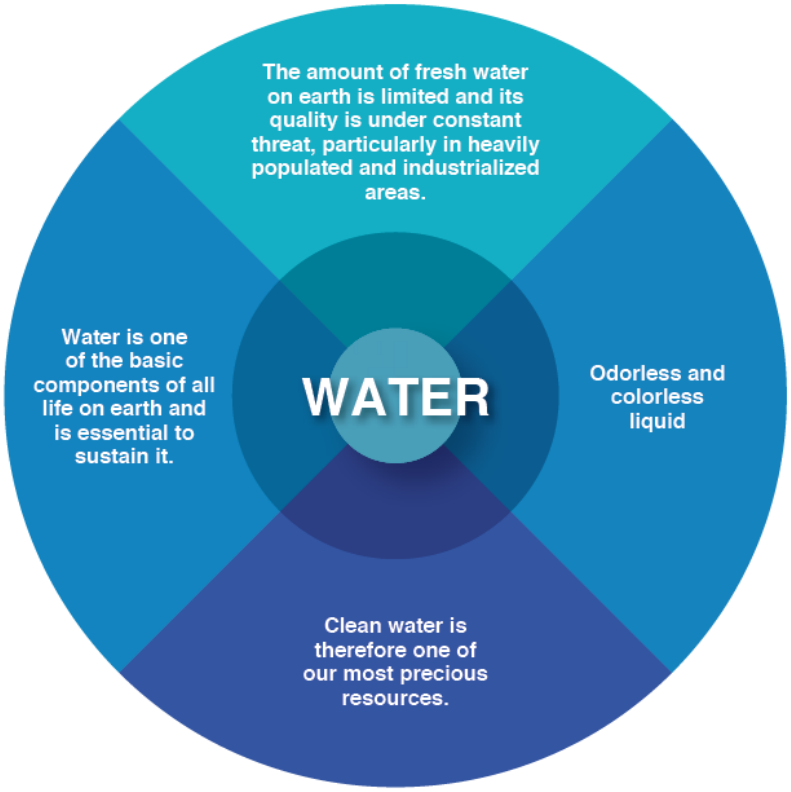
B. Waste Management	
1. Wastewater	
1	Wastewater is treated accordingly using green practice.
2	Wastewater sample is collected and analyzed annually. - Current year value - _____ - Previous year value - _____
3	Use of reclaimed or recycled water.
2. Indoor Environmental Quality	
1	Are you satisfied with the indoor air quality of your establishment?
2	Have you made any changes to the environment/surroundings to improve your indoor air quality?
3. Hazardous Waste	
1	Collection of hazardous solid waste. - Current year value - _____ - Previous year value - _____
2	Segregation of solid waste for proper disposal.
4. Procurement and Management	
1	Collection of hazardous solid waste. - Current year value - _____ - Previous year value - _____
2	Segregation of solid waste for proper disposal.
3	Checklist to categorize and identify products for 4R practice (Reduce, Reuse, Recycle, Replace).
4	Self-evaluate/self-audit waste management.
5	Benchmark and analyze waste generated and cost implication yearly.
6	Periodical staff training on waste management.

WHAT IS WATER?

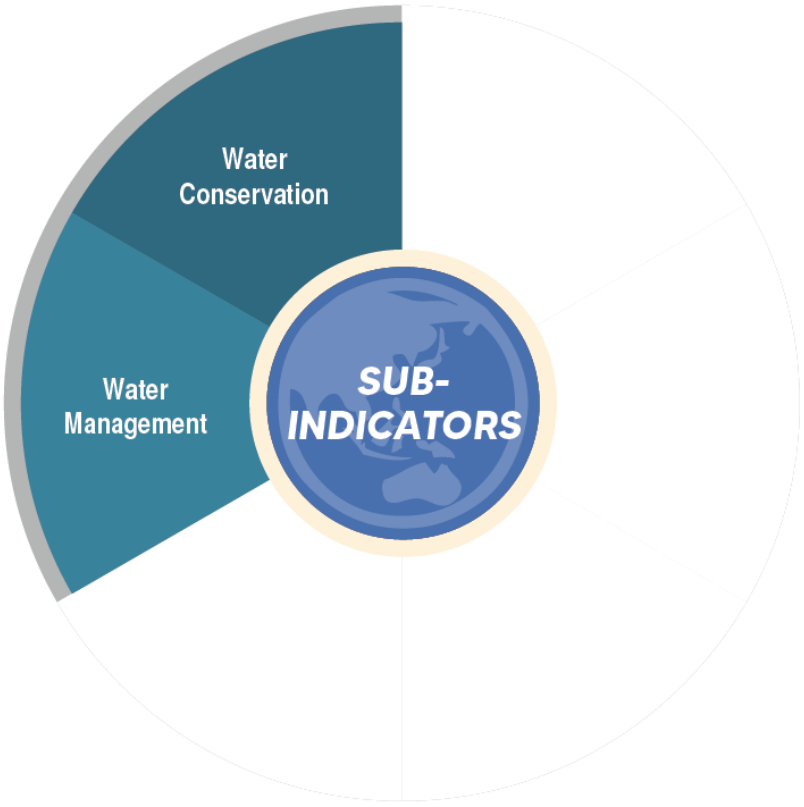
Despite two-third of the Earth's surface being covered by water and its capability of being renewable, issues such as water shortages in local vicinities and its quality are frequent. At the current rate of global consumption, it is projected that water supplies will be overtaken by the demand for freshwater by 40% by 2030. Thus, it should be alarmed that water consumption that is not renewed and not returned to its original source with its initial quantity and quality throughout its cycle will cause depletion of other freshwater resources.

TARGET: To ensure that the efficient used of water in the daily operations could be improved so that the rate or re-circulation of the consumed water is enhanced in the business operations. The target for Water Harvesting Technology is around 60% of building installed with Rainwater Harvesting System as stated in the Green Technology Master Plan Malaysia 2017-2030.

GUIDING PRINCIPLES



Facilities should measure how much water is being recycled or recirculated. In this respect, the organization needs to have guidelines on how to use less water, how to keep it free from contamination during use and how to ensure responsible treatment of your wastewater. The aim is to focus on increasing the rate or re-circulation of the consumed water. In this context, the sub-indicators for water include water conservation and water management.



Sub-Indicators for

Water

The overall target setting and strategic plans for the indicators of water management are summarised in the snapshots of the strategic approach in Figure 3.5.

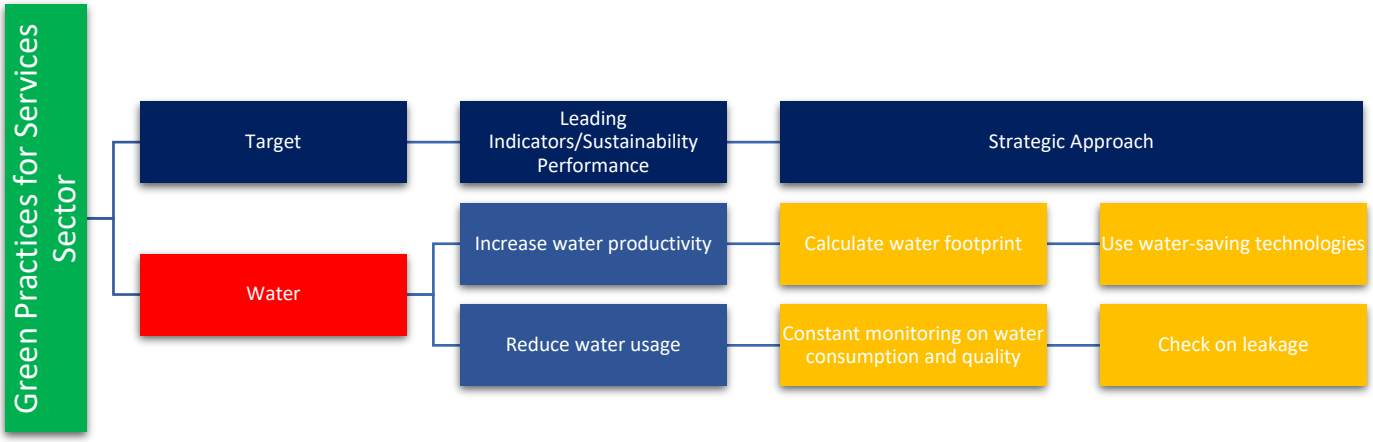


Figure 3.5 Summary of Targets, Indicators, and Strategic Approach of Water Management

Table 3.3: Explanation for Sub-indicators for Water

Green Practices Sub-Indicators	
1	**Water Conservation**

	• Water conservation is critical when the freshwater supply can be depleted. The services industry should identify its water sources and ways to mitigate water wastage. This includes applying best practices derived from various industries which can be made applicable.
	• It is pertinent to observe of the following:
	  • Identify water source
	  • Improving the efficiency of water usage
	  • Invest in water-saving technologies
	  • Promote best practices in water conservation.

2	**Waste Management**

	• Water Management is linked to managing the supply of water while assessing current usage on the premise. Managing water prioritizes on the water quality but is not limited to auditing and benchmarking of water usage.
	• The following include the ways of water management:
	  • Monitoring water quality based on the standards set by international organizations.
	  • Identify treatment or technique in attaining water quality.
	  • Promote water consumption reduction and conservation
	  • Benchmarking water usage.
	  • Conduct a water audit.

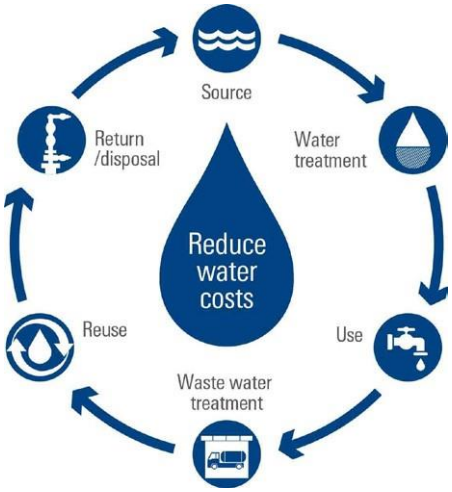
METHODOLOGY OF THE INDICATORS

To understand further, each of the sub-indicators needs to be operationalized for easy interpretation. The explanation and the examples are explained below.

1. Water Conservation

No	Description
1	To conserve the water, organizations must know that Water consumption as per industry may differ due to the nature of the business. The hospitality sector may utilize a higher volume of water as compared to professional sectors. In this scenario, water consumption can be categorized into two: direct and indirect water consumption. The former indicates water usage for main activities such as bathing, water activities, and laundry purposes. The latter focuses on the water used in the production of goods and services for the consumer.
2	The water footprint can be calculated by summing up the volume of both direct and indirect water footprints. Water footprint = Direct water footprint + Indirect water footprint
3	Identifying the water source is equally essential as the use of a fresh water supply can be minimized. For instance, water from agriculture use can be derived from reclaimed water from condensate collection or water from the aquarium. Rainwater harvest is equally encouraged as a natural alternative water source.
4	Water-saving technologies have also gained attention: premises have installed low-flow pre-rinse spray valves, faucet aerators, flow controllers, and sensors. However, these practices will not be effective if the effort is solely dependent on the operators. Consumers should be made aware of the aspiration of the business.
5	Business owners should be consistent and active in engaging customers in realizing this objective. This includes putting up notices around the premise to subconsciously inform customers about the ongoing effort. (e.g., linen reuse program, informing changes made to save water).

2. Water Management



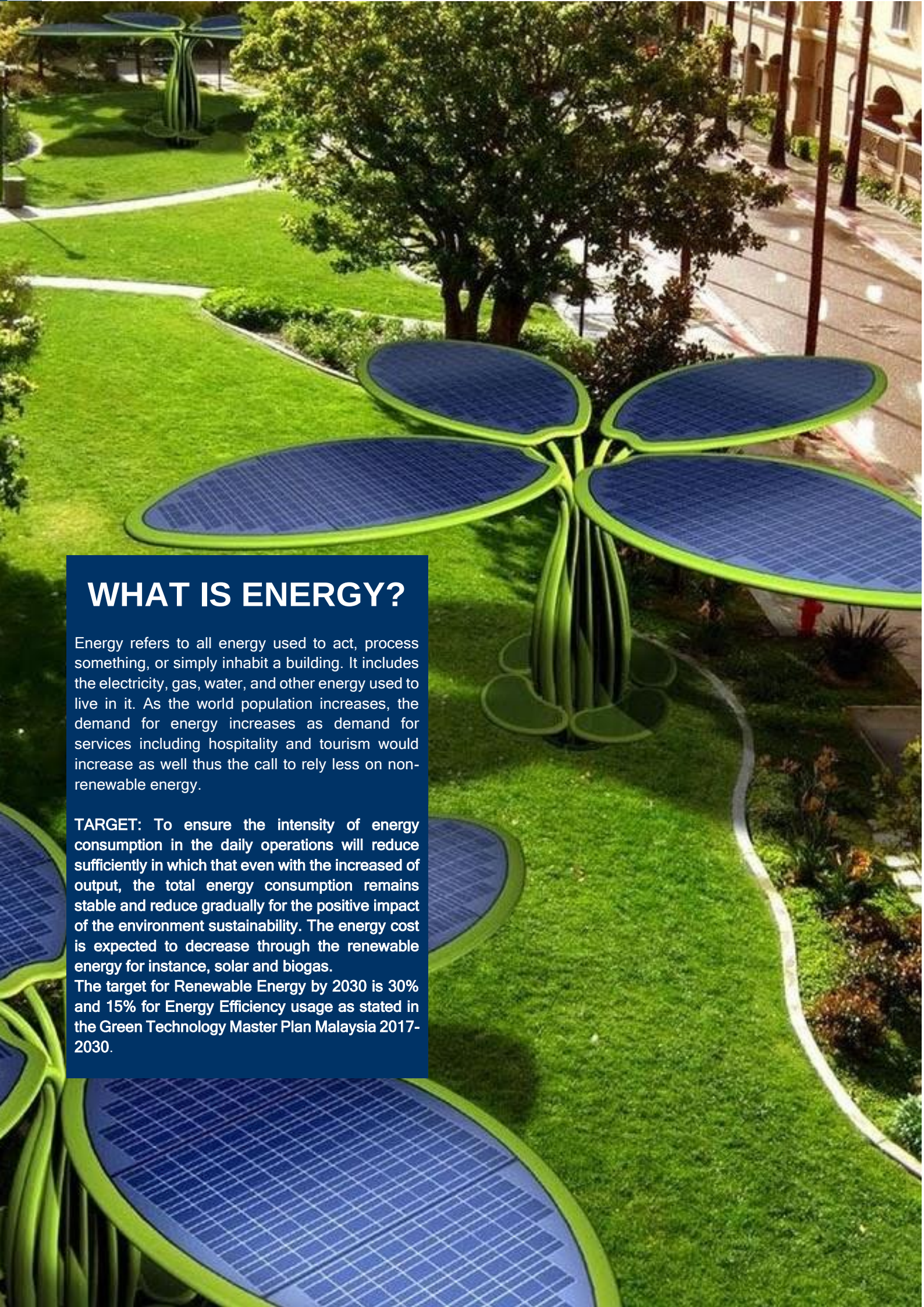
No	Description
1	The quality of the water supply catered to businesses should adhere to the minimum requirements set by World Health Organization (WHO), the European Commission (EC), national and local statutory regulators, the hotel industry, and your own hotel group. Water quality for consumption should be monitored periodically while making results available publicly. Issues about water quality should be addressed promptly.
2	Conservation of water also requires an efficient and effective water management system. A strategic plan should be drafted with the goals to reduce water consumption and the aims to implementing new water-saving measures. For instance, 5-year planning is encouraged while comparing the data available from year-to-year.
3	To monitor water usage as part of managing water, measurement of water usageshould include all facilities and areas involved. This includes installing water meters in main consumption areas and using relevant technologies to read the data. Flow rate should also be supervised as this could indicate leakage and anyother failures in the piping system.
4	Water conservation should not compromise the experience and comfort of the guest. Taking the right measures will ensure a high level of satisfaction for the customer when patronizing the business. As a result of monitoring, benchmarking should be done to observe the pattern of usage and set new goals and policies to reduce water consumption, Hence, a key performance index for water consumption can be established in the following way: $\frac{Total\ water\ consumption\ per\ week/month/year}{total\ consumer\ per\ week/month/year} = Water\ consumption\ per\ consumer\ (l/pax)$ A drastic change of behavior in the flow rate and consumption should signal faults in the piping system. As such, leakages should be addressed promptly as it results in higher costs and more wastage.

Area	Total Units	Total Consumption (m^3)	Percentage (%)	Consumption per unit (m^3)
Rooms	200	1,500	25	7.5

ASSESSMENT AND EVALUATION

Organizations need to understand the specific tool to assess and evaluate their performance on the indicators that serve as a guideline for them to control their damage to the environment. The suggested tool for material is shown below:

C. Water	
1. Water Conservation	
1	Identify all water sources in the premise.
2	A water footprint is generated annually. - Current year value - _____ - Previous year value - _____
3	Use of water-saving technologies.
4	Constant engagement with customers to promote water conservationawareness.
2. Water Management	
1	Quality of Water Supply. - Standard used - ____ - Current year value - _____ - Previous year value - _____
2	Monitoring of water usage according to the department. - Current year value - _____ - Previous year value - _____
3	Monitoring of water usage per consumer. - Current year value - _____ - Previous year value - _____
4	Constant monitoring for leakages or poor flow rate.
5	Adhere to the water management policy in place



WHAT IS ENERGY?

Energy refers to all energy used to act, process something, or simply inhabit a building. It includes the electricity, gas, water, and other energy used to live in it. As the world population increases, the demand for energy increases as demand for services including hospitality and tourism would increase as well thus the call to rely less on non-renewable energy.

TARGET: To ensure the intensity of energy consumption in the daily operations will reduce sufficiently in which that even with the increased of output, the total energy consumption remains stable and reduce gradually for the positive impact of the environment sustainability. The energy cost is expected to decrease through the renewable energy for instance, solar and biogas.
The target for Renewable Energy by 2030 is 30% and 15% for Energy Efficiency usage as stated in the Green Technology Master Plan Malaysia 2017-2030.

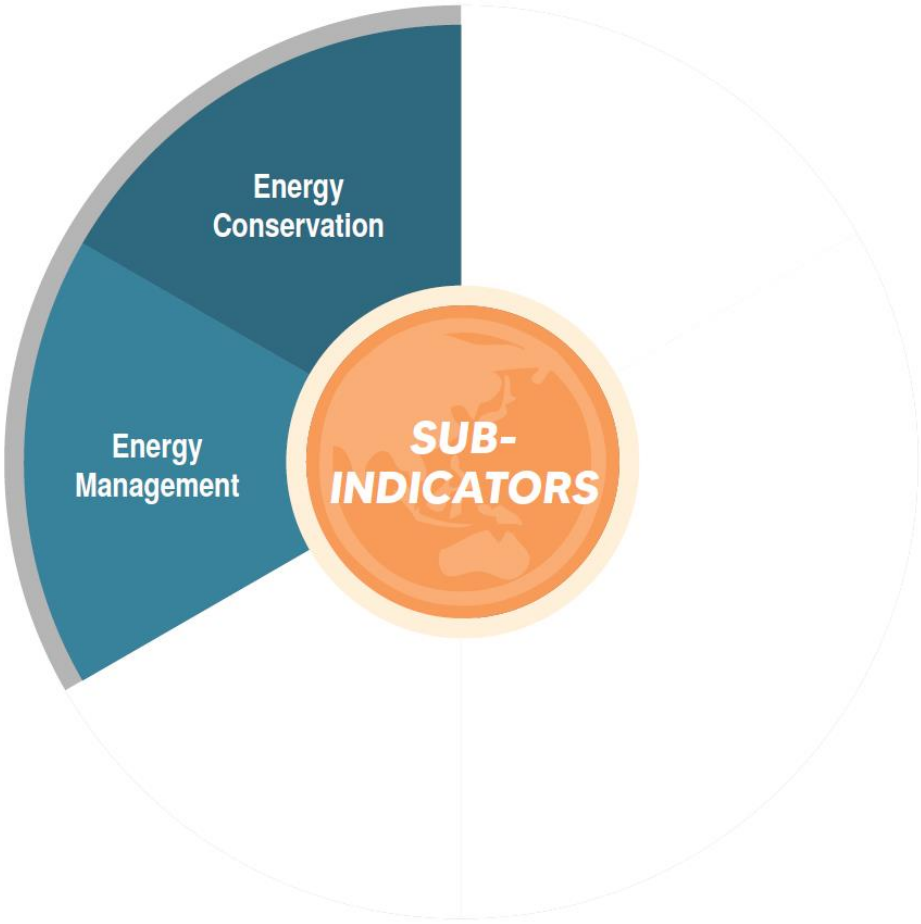
GUIDING PRINCIPLES

The high consumption of both renewable and non-renewable energy would eventually lead to drawing further non-renewable sources such as fossil fuels and earth minerals. Resorting to these sources of energy without considering their impact will cause greenhouse gases' (GHG) and heat to the atmosphere.

The dependency on renewable energy is also another concern as the cost and resources used to produce or renew energy are costly. While certain renewable energies rely on natural resources such as hydroelectric and solar, the infrastructure to generate these energies requires an energy-intensive workforce and resources to deploy.

Carbon footprints and GHG emissions should be of the highest concern due to their impact on the environment. Hence, reducing energy consumption would be the most practical way. Business operators should act on reducing energy while not forgoing the efficiency and productivity of the business. It is also advised that total energy consumption should be maintained at a stable rate or reduced for a lower cost of operation.

The aim is to focus on reducing the overall consumption of energy in the processes, facilities, operations, and management. The possible sub-indicators include energy conservation and energy management.



Sub-Indicators for

Energy

The overall target setting and strategic plans for the indicators of energy are summarised in the snapshots of the strategic approach in Figure 3.6.

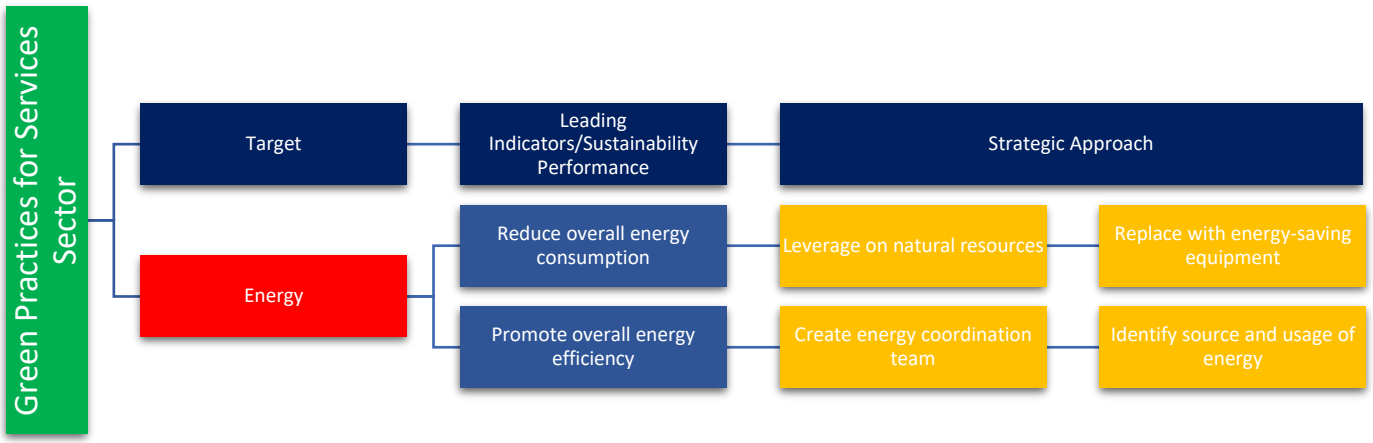


Figure 3.6 Summary of Targets, Indicators, and Strategic Approach to Energy

The explanation of each of the sub-indicators is listed in Table 3.4.

Green Practices Sub-Indicators	
1	**Energy Conservation**

	• Energy conservation describes savings of the overall consumption of energy in the business operation. This also means the reduction in the total consumption of energy through the utilization of renewable energy, heat integration, or co-generation options
	• The impacts include:
	  • Energy production depletes non-renewable resources and generates greenhouse gases either during its production, transportation, or use
	  • Energy consumption also adds to the operation and overhead costs
	• Minimize use of energy-intensive equipment
	• Minimize the use of indirect energy consumption.
	• Leverage natural lighting.
	• Increase the use of energy-saving equipment.
	• Review energy used for heating, ventilation, and air-conditioning (HVAC)

2	**Energy Management**
	• Energy management means strategies to control energy usage. This includes: • Monitoring of energy use • Benchmarking of energy use • Set new goals in reducing energy usage • Monitor and benchmark energy usage according to departments • Conduct energy audits to identify energy conservation options that can be applied.

METHODOLOGY OF THE INDICATORS

To understand further, each of the sub-indicators needs to be operationalized for easy interpretation. The explanation and the examples are explained below.

1. Energy Conservation

No	Description
1	Energy used in the premise should first be detected of its origin. While the use of electricity generated from coal and fossil fuel is inevitable, alternatives can provide better solutions besides reducing operational costs. In hot and humid tropical countries such as Malaysia, leveraging on solar energy should be well considered by business operators. Though installation of solar panels can be costly, maintenance and upkeeping of the mechanisms are low.
2	Indirect energy consumption is generated from the production and logistics of goods and services, for instance, the energy used along the process of making processed food. The services industry may opt for different styles and options that use lesser indirect energy. For instance, corn shipped to businesses should not be repacked using plastics but relying on the natural husk. This reduces the energy used to create plastics and in the packing process.
3	Equipment used should be replaced with energy-saving equipment. To identify energy-saving equipment, it should have at least Energy Star or Energy Efficient labeling by Malaysia Energy Commission. It is recommended that the equipment used should be at least 4 stars for effective energy savings.
4	Lighting should have a European Union energy label of at least Level C and above (Level A is the lowest consumption). Consider factors such as wattage, lamp life, and brightness of the lamps to suit the use and applicable area.
5	New buildings designed, not excluding existing buildings should also leverage on natural lighting. Hotel lobbies and front desk offices may use natural daylight throughout, provided with good visibility and ergonomics. The decision made on the choice of blinds and curtain materials should be consulted before procuring which can leverage natural lighting.
6	Heating, ventilation, and air-conditioning (HVAC) are commonly known to consume a large part of the total energy cost. Therefore, the refurbishments and design of the building should be focusing on minimal losses in heating and cooling. Operators should select the right paint, material, and equipment used surrounding the building to prevent full load on the HVAC system. Zoning and installation of automatic control and regulation systems are encouraged in minimizing energy consumption.

2. Energy Management

No	Description
1	Energy usage should be assessed and monitored from time to time. This allows the management to benchmark and analyzes the total energy used in every department. Energy consumption can also be roughly calculated: $\frac{Total\ energy\ consumption\ per\ month/year}{total\ department/\ consumer\ per\ month/year} = Energy\ used\ per\ department/consumer\ (kWh)$
2	Electricity usage can also be calculated based on per area usage: $\frac{Total\ energy\ consumption\ per\ month/year}{Total\ floor\ area\ (m^2)} = Energy\ used\ (kWh/m^2)$ To measure electricity usage effectively, it is recommended that submeters areinstalled for each utility or area.
3	Equipment in the premise should also be identified and documented for further action:
4	An action or strategic plan can be drafted out in achieving certain targets and KPIs.The steps of implementing the action plan can be as follow: • Audit of total energy use • Benchmarking of data collected on energy use with businesses of similarindustries • Consult experts and engineers to set realistic deliverables • Communicate goals to employees via publicly available data • Setting up an energy coordination team • Draft standard operating procedures • Involve participants and inform all stakeholders including consumers • Provide training to employees • Monitor and supervise the implementation

Equipment	Total Units	Location	Type	Classification
Daikon 1HPAC	20	Lobby	Air-conditioner	3-star Energy Star

ASSESSMENT AND EVALUATION

Organizations need to understand the specific tool to assess and evaluate their performance on the indicators that serve as a guideline for them to control their damage to the environment. The suggested tool for material is shown below:

D. Energy	
1. Energy Conservation	
1	Identify all energy sources in the premise.
2	Identify and label energy-intensive equipment and reduce usage.
3	Identify and replace equipment with energy-saving equipment.
4	Identify and replace lighting with the European Union energy label of at least Level C and above.
5	Leverage natural lighting in selected areas.
6	Implement and regulate HVAC system to minimize energy consumption.
2. Energy Management	
1	Measure energy consumption used by department/consumer. - Current year value - _____ - Previous year value - _____
2	Monitoring total energy consumption per floor area. - Current year value - _____ - Previous year value - _____
3	Identify and label equipment.
4	Setting up of energy coordination team.
5	Benchmark and analyze energy use with other businesses.
6	Periodical staff training on energy management.

WHAT IS INNOVATION?

Innovation in green practices comprises all types of innovations that contribute to the creation of key products, services, or processes to reduce the harm, impact, and deterioration of the environment while optimizing the use of natural resources.

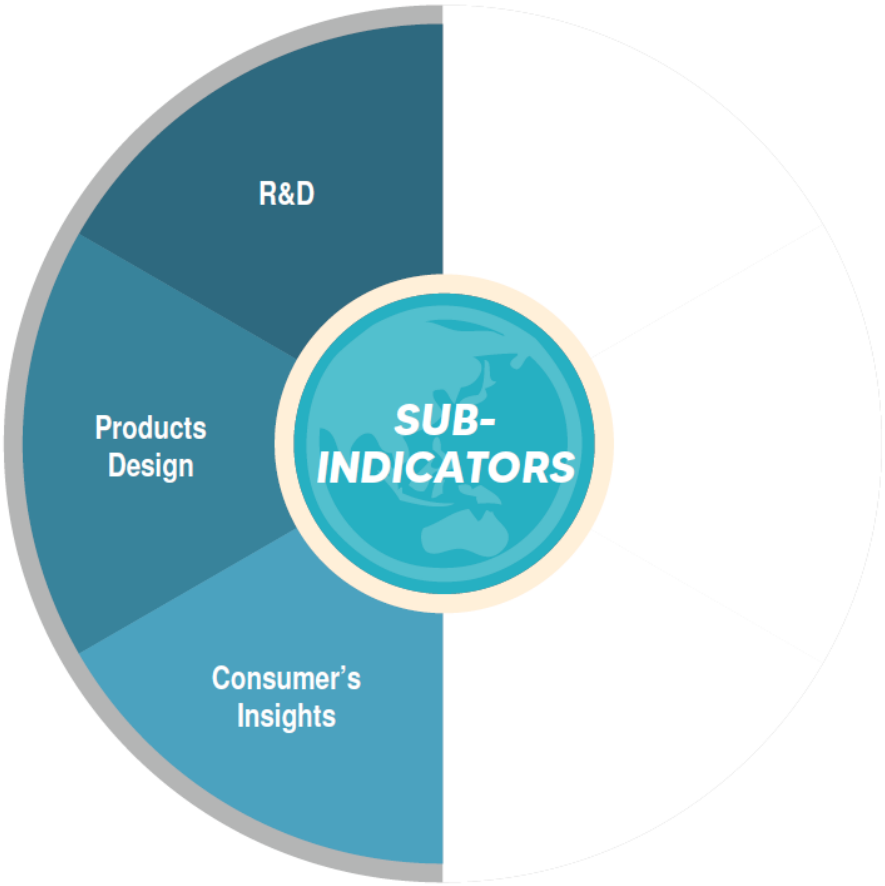
Target: To ensure the continuous support and recognition on green innovation and sustainable practices on the practices and operations of the services sector. These include effort and financial commitments in Research & Development and product design that support the green practices by more than 50% by 2030.

GUIDING PRINCIPLES

Innovation covers the R&D that incorporates technological improvements that can lead to energy saving, pollution minimization, waste recycling, green product development, and corporate environmental management.

Innovation in the services sector seeks to analyze the role of green innovation in the transition of the hospitality industry (hotels, restaurants, travel agencies, tour operators) to a green economy; how green innovation aligns with specific structures, mechanisms, and good practices; and what can be done to accelerate the diffusion of green innovation in the sector. The innovation indicator covers research and development efforts into green technology and its direct implementation in the services sector, as well as the different phases that incorporate green product design.

The aim is to support, recognize and advocate green innovations and sustainable practices within the traditional manufacturing processes and operations. This includes efforts and financial commitments in research and development (R&D) and product design that supports green practices and products. The scope of innovation includes three (3) sub-indicators: Research and development (R&D), Product Design, and Consumer Insights.



Sub-Indicators for

Innovation

The overall target setting and strategic plans for the indicators of innovation are summarised in the snapshots of the strategic approach in Figure 3.7.

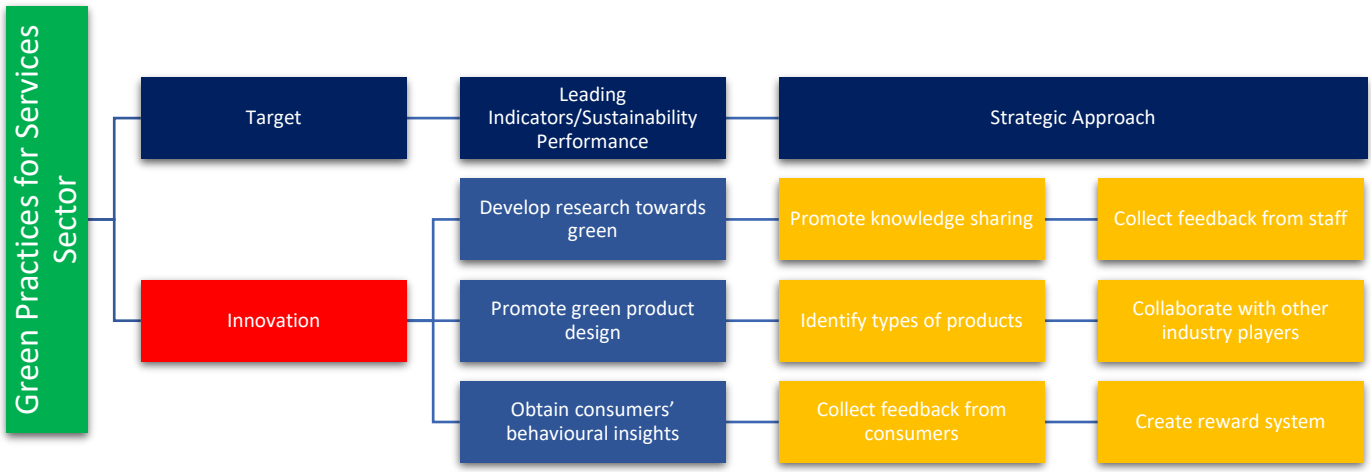


Figure 3.7 Summary of Targets, Indicators, and Strategic Approach to Innovation

The explanation of each of the sub-indicators is listed in Table 3.4.

Green Practices Sub-Indicators	
1	**Research and Development (R&D)**
	In the R&D sub-indicator, the elements include monetary and time investments, and several patents or scientific papers published about green processes or innovations in the processes, operations, or practices. The impact includes: • R&D allows new and emerging technologies to be applied directly into processes, further increasing productivity, and improving the products. • Strategic investment in R&D and innovations enables green technology. • Knowledge transfer efforts with international bodies and industries. • Surveying at the end of service on the awareness of green practice in the business • Collect data from the front desk or counter. • Create a report and benchmark using the right tools and measurements.
2	**Design**
	New Design and redesign of the existing offering include the know-how about how to scale both green supplies and production of new products/services. Reputation management and differentiated from 'greenwashing'. The impact of includes: • Thoroughly redesigned around green innovation such as new inventions and participating in technology initiatives which will minimize the negative impact on the environment. • Optimize lifetime of product by increasing reliability and durability. • Incorporate the design of the operation that stimulates sustainable behavior. • Incorporate the use of recyclable materials with an existing market.

3	Consumer Insights
	Consumer insights and behavioral insights of consumers are preferences learned from the analyzed data collected to tabulate on the pattern of consumption. This is crucial for any business as business operators can cut costs on unnecessary expenditures while maximizing their profit. Likewise, understanding consumers' behavior will assist businesses to get a perspective or insight on how to operate their business more profitable. Furthermore, by understanding the behavior, businesses can anticipate the demands of the customers by tailoring to their needs without at the expense of harming the environment. For instance, creating the awareness of green practices among consumers will eventually instill the thought of how the environment can be protected by these significant gestures. • Affordability of products and services • Providing high-quality service constantly whilst practicing green • Ensuring the use of sustainable and green materials. • Ensuring consumers' highest level of satisfaction • Obtaining consumers' behavioural insights on their pattern of consumption and demands

METHODOLOGY OF THE INDICATORS

To understand further, each of the sub-indicators needs to be operationalized for easy interpretation. The explanation and the examples are explained below.

1. Research and Development (R&D)

No	Description
1	Investment should be made strategically as a continuity to promote R&D and innovations; to procure new technologies to be embedded into existing infrastructure, systems, and processes. The introduction of new technologies enables the business to sustain as well as implement new practices. For instance, digital technologies that promote interaction and user-friendliness pave way for the paperless effort
2	R&D should not only be limited to promote higher satisfaction among consumers but also delving into better green practices that save resources and the cost of the business. Benchmarking can be identified as a knowledge transfer method and collaborative effort in linking international bodies, industries, researchers, and academia from higher learning institutions. This promotes the sharing of best green practices and the gaining of new insights; in a common effort of saving the Earth. Conduct casestudy where applicable.
3	Rich data for research and analysis should not only be collected within the premise but also among the end-users. Feedback and comments should serveas a basis and awareness to improve the service, besides from the betterment of the establishment. These can be obtained via the feedback form or impromptureresponses.

2. Design

No	Description
1	The lifespan of the product should be optimized and suit its use. The reliability and durability of the product should be highly prioritized. This should subsequently reduce the amount of waste produced hence saving on resources and cost in the long term.
2	Single-use products should be avoided and be replaced with containers that are reusable and returnable. The design of the product selected should also be repaired and maintained easily while being user-friendly (e.g., indicate opening instructions for cleaning and repair, and allow the location of wear to be detectable on parts which simplify dismantling and replacement)
3	Another characteristic to consider is the product design is the modularity which allows upgrades besides prolonging the lifetime of buildings, equipment, and resources used. The design of products should be made standardized across industry players or other business operators to reduce the use of other indirect resources. Products such as water bottles, bedsheets, and furniture can be repaired at a minimal cost. Thus, it is recommended that the designs should be minimalistic to avoid additional costs. Design for products should also anticipate the possible needs of users in the future. New furniture and elements of the building should feature current or upcoming trends, such as the use of USBC instead of USB-A. Bathtubs in hotel rooms should be replaced with shower heads to prevent water wastage.
4	Materials used to create new products should be recyclable or natural at best. Instead of plastic wrappers, consider paper-like materials or leaves as substitutes. Facilitate a reuse or recycling approach by being mindful of the compatibility of metals, plastics and glass, and ceramics while avoiding polluting elements during product design.

3. Consumer Insights

No	Description
1	Feedback obtained from consumers' usage patterns should be analysed by business operators. This gives great insights for businesses to examine the areas to improve on.
2	Businesses can leverage on increasing their revenue by satisfying their customers' needs and preferences while reducing possible risks to their reputation. Enquire and obtain local and international certifications to recognize your property's effort to promote green practices which eventually attracts more consumers.
3	It should be reminded that these initiatives, however, should not be at the expense of the consumers' satisfaction. These initiatives should promote a higher level of satisfaction as compared to their prior experience in the same establishment.
4	Business operators should also reinforce and create positive new beliefs for the consumers by acknowledging the effort of the business in going green. This includes instilling emerging habits through new rewards and offerings. A reward system can be designed to elevate consumers' experience besides supporting the green practices of the business.

ASSESSMENT AND EVALUATION

Organizations need to understand the specific tool to assess and evaluate their performance on the indicators that serve as a guideline for them to control their damage to the environment. The suggested tool for material is shown below:

E. Innovation	
1. Research and Development	
1	Planning on investment to promote R&D and innovations.
2	Conduct knowledge transfer sessions with international bodies and industries.
3	Engage with academia from higher learning institutions.
4	Participate and engage with businesses of a similar sector.
5	Collect feedback from staff on green practices.
2. Design	
1	Percentage of single-use products purchased in the total amount spent. - Target -____% - Current year value -_% - Previous year value -_____%
2	Engagement with other industry players for product collaboration.
3	Identify and label equipment.
4	New products comprise recyclable or natural materials. - Target -____% - Current year value -_% - Previous year value -_____%
3. Consumer Insights	
1	Collect feedback from staff on green practices.
2	Tabulate and analyze the data of items and products used.
3	Obtain local and international certifications in green practice.
4	Create a reward system for customers based on green practices.
5	Collect feedback from the consumers on their experiences, satisfaction with green initiatives, and sustainability

WHAT IS MANAGEMENT?

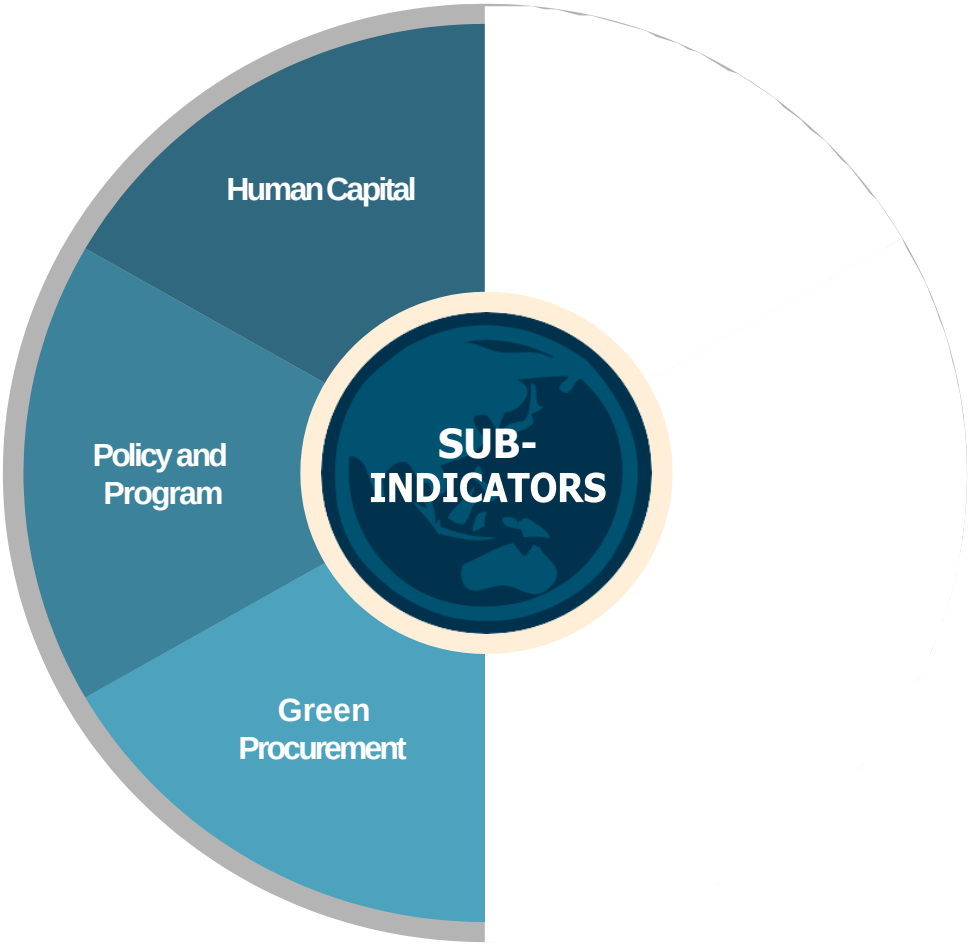
The management and administration of an organization including the services sector must embed the practice of greenness to ensure that the right forward-thinking policies that support the development of the green industry are created. Management in innovation helps in bringing deliberate change in administrative practices to embrace the green concept for the organization to be more efficient and innovative.

Target: To ensure the adoption of efficient service operations for sustainable and proficient of the administration of the green practices in the services sector such as green policies, training & development, practices, systems, and structure that stimulate the creation and availability of green jobs within the organisations to be achieved by more than 50% by 2030

GUIDING PRINCIPLES

All stakeholders, including employees and customers, benefit from taking measures to reduce the negative impacts of the process on the environment.

Being environmentally responsible entails more than just meeting legal requirements; it also means going beyond compliance and investing more in human capital and management practices that contribute to the industry's green initiatives. The aim is to focus on embedding green policies, practices, and systems that stimulate the creation and availability of green jobs within the organization. The scope of management includes three sub-indicators: policy and program, green procurement, and human capital.



Sub-Indicators for

Management

The overall target setting and strategic plans for the indicators of innovation are summarised in the snapshots of the strategic approach in Figure 3.7.

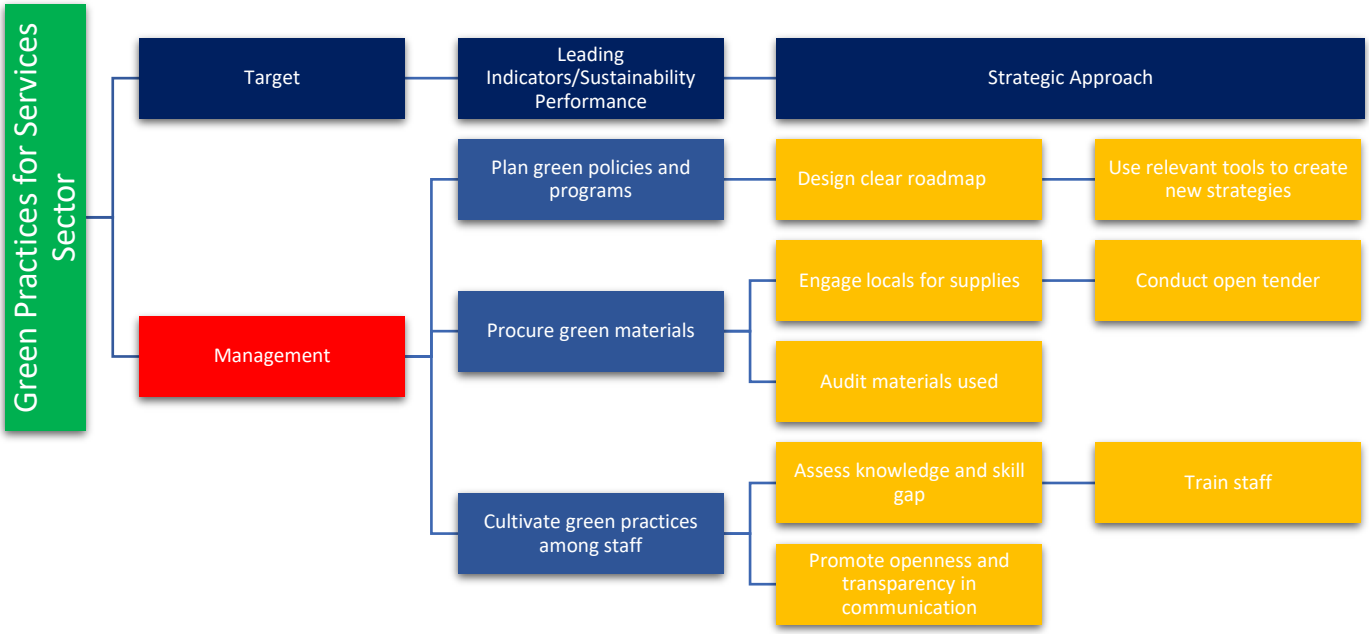


Figure 3.8 Summary of Targets, Indicators, and Strategic Approach of Management

The explanation of each of the sub-indicators is listed in Table 3.6.

Green Practices Sub-Indicators	
1	**Policy and Program**
	Policy and program entail conformance to national and international standards in environmental management and compliance with safety regulations. In addition, additional initiatives such as developing green metrics in an organization or conducting in-house and external programs to support the green initiative are also included. The impact includes: • Promotion of recycling and reuse practices along with other sustainable environmental management practices among workers of the organization or company • Promotion of recycling and reuse practices, along with other sustainable environmental management practices among the employees. • Raise awareness of responsible and sustainable consumption through internal campaigns. • Developing green policies or standards of operations that apply to all aspects of operation within the organization.
2	**Green Procurement**
	Green procurement refers to the procurement of materials, products, services, and works that take into consideration environmental criteria that minimizes the adverse impacts of human activities. The impacts include: • Purchasing environmentally friendly products and services. • Including environmental requirements in specifications with contractors, suppliers, and service providers.

	• Establishing a mechanism to determine the level of greenhouse gas emissions generated by the suppliers. • Purchasing environmentally friendly products and services. • Including environmental requirements in specifications with contractors, suppliers, and service providers. • Establishing a mechanism to determine level of greenhouse gas emission generated by the suppliers.
3	**Human Capital**
	Human capital refers to the creation and availability of green jobs at management, technical or professional levels. It also includes capacity building and training for the existing workforce to improve their skills, capabilities, attitude, and commitments. The impacts include: • Shortage of skill in green technology implementation represents barriers to ecological progress, delaying technological and economic transformation. • The global move towards a green economy is changing the current scenario of job creation, skill evolution, and job quality. • Green human capital influences the successful implementation of green practices in the organization. • Opening opportunities for the current workforce to become competent people for green practices. • Implementing policies, practices, and systems that stimulate the creation and availability of green jobs within the company. • Embedding green practices within human resource management functions

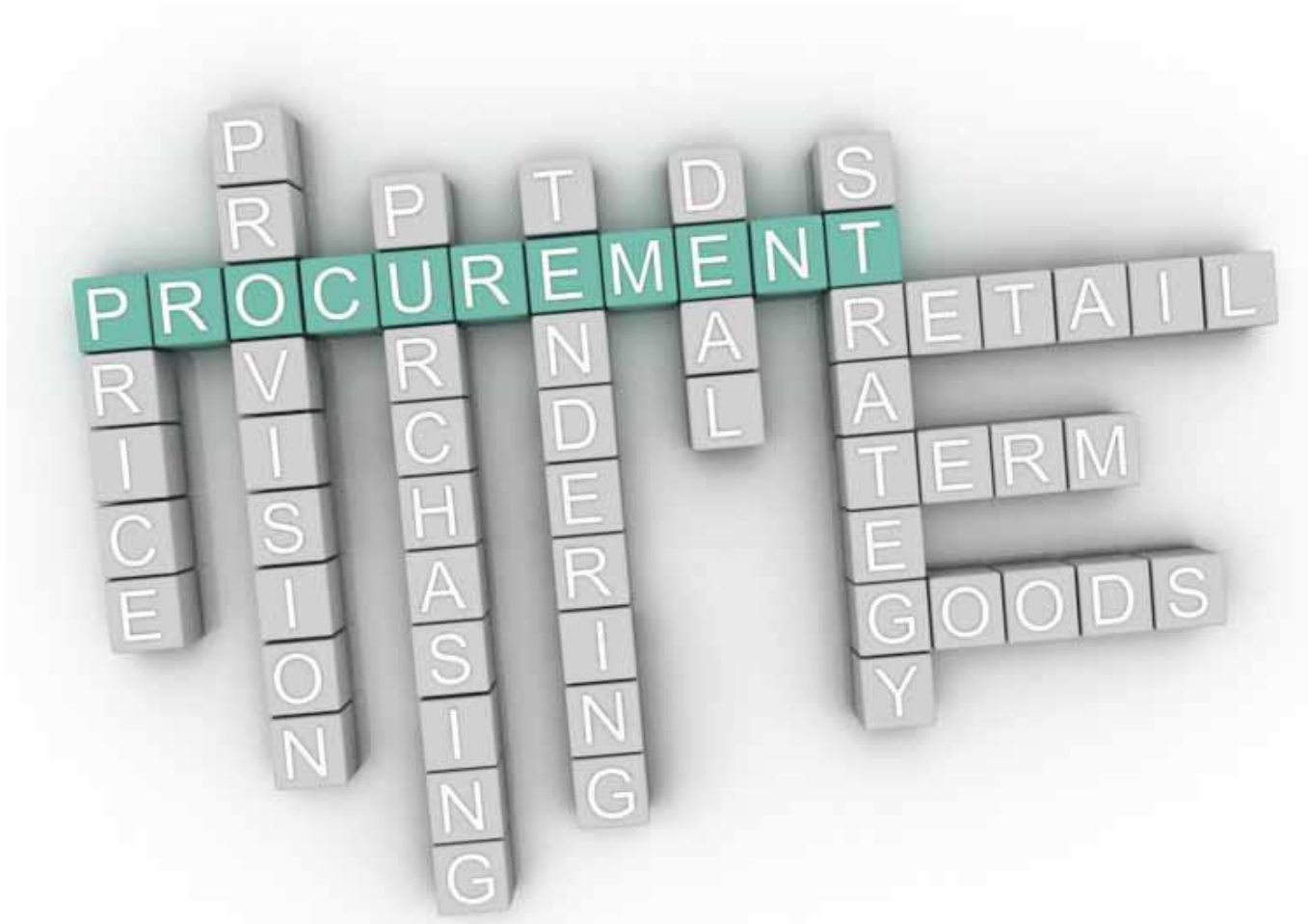
METHODOLOGY OF THE INDICATORS

To understand further, each of the sub-indicators needs to be operationalized for easy interpretation. The explanation and the examples are explained below.

1. Policy and Program

No	Description
1	The main workforce of the business premise is the employee. While operation employees are relatively more than the employees at the managerial level, theyshould receive first-hand information and guidance on the new policies and programs carried out.
2	Ensure employees are familiar with policies and programs and that they understandthe importance of business ethics. Provide adequate training to promote cultural,environmental, and ethical awareness besides safety. Newly initiated green policies and programs must be implemented carefully to notinterrupt the dynamics of the workforce. Proper planning of the implementation canavoid information dilution as well as redundancy in delivery. Engage stakeholdersto discuss the proposed policies and programs to obtain feedback
3	Incentives and rewards can be rewarded from the cost saved because of the newpractice. Provide constructive feedback for personal growth and do performance appraisals yearly. For instance, staff can be rewarded incentive for reducing virginpaper use in printing.
4	Draft clear roadmaps and steps for implementation. Consistently create engagement sessions with employees to update progress and gain feedback. Use relevant management tools such as Root Cause Analysis and Plan, Do, Check, and Act Chart. Use digital platforms to create awareness and monitor progress.

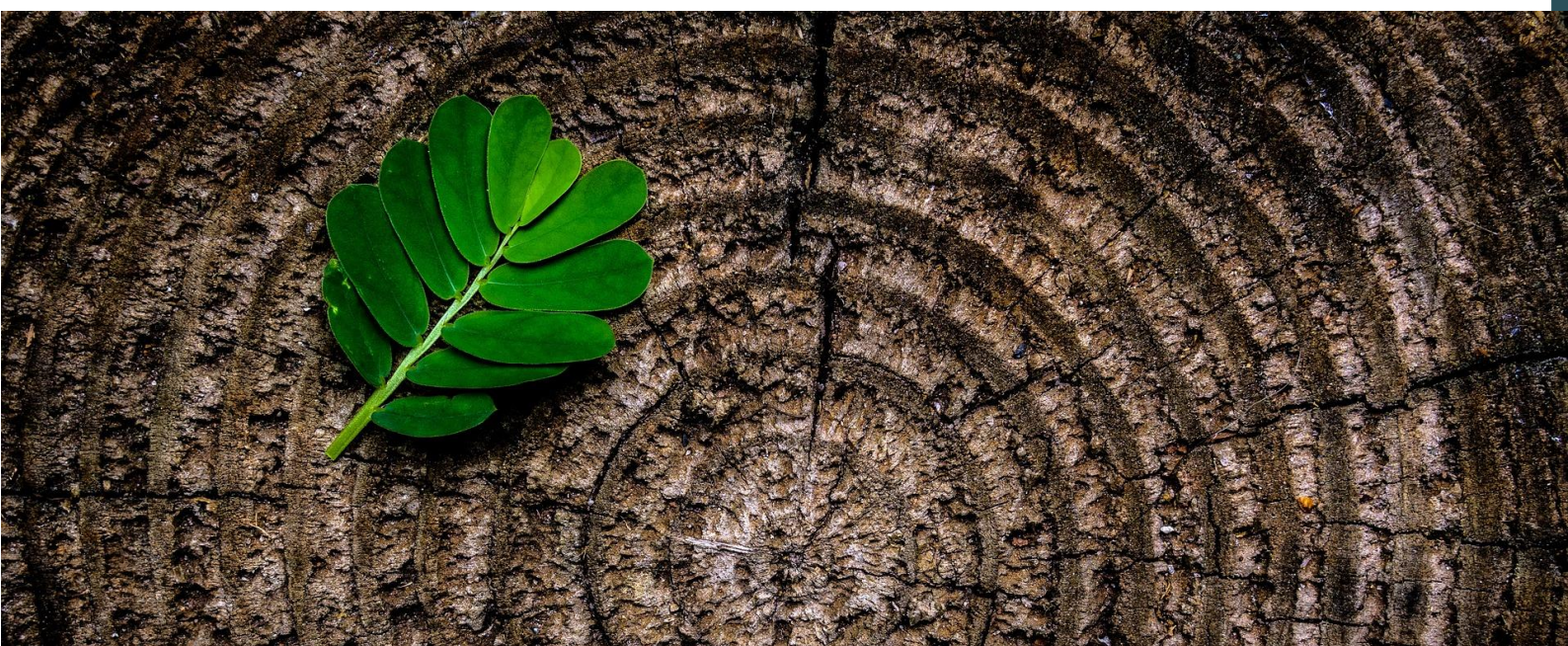
2. Green Procurement



<table>
<tr><th>No</th><th>Description</th></tr>
<tr><td>1</td><td>Well-managed supply chain and purchase from responsible suppliers who pledgein committing to green practices and for the environment. Screen and conduct open tender for transparency and integrity check. Scout and gain information about the suppliers before dealing.</td></tr>
<tr><td>2</td><td>Give priority to products that are ethically sourced, fair-trade, biodegradable or recyclable, and that have minimal packaging. Discuss with local businesses for partnerships in taking bulk orders.</td></tr>
<tr><td>3</td><td>Ask for proof of green or eco-friendly certifications for the products if applicable.Advertise products with minimal labelling and cost to create awareness among consumers. Encourage consumers to shop and travel green consciously.</td></tr>
<tr><td>4</td><td>Audit materials and products used in departments to consider for replacements or phasing out. For instance, replace paper tickets for parking bays with reusablecards.
Purchasing and Suppliers can be recorded as follow:
<table>
<tr><td>Department:</td><td colspan="4">Kitchen</td></tr>
<tr><td>Year:</td><td colspan="4">2021</td></tr>
<tr><td>Purchases</td><td>Previous year (%)</td><td>Current year (%)</td><td>Target (%)</td><td>Achieved Target (Y/N)</td></tr>
<tr><td>Appliances</td><td>30</td><td>40</td><td>50</td><td>N</td></tr>
<tr><td>Food</td><td>70</td><td>70</td><td>70</td><td>Y</td></tr>
<tr><td colspan="3">Total targets achieved (%):</td><td>50%</td></tr>
</table></td></tr>
<tr><td>5</td><td>Support local enterprises of related sectors that promote green initiatives. Hotel industries can collaborate with local tour guides and local craftsmen for more exposure. Promote locally owned and run restaurants where they can buy souvenirs that have been made by local entrepreneurs.</td></tr>
</table>

3. Human Capital

No	Description
1	To be in line with the current effort of the organization in promoting green practices, human capital should be geared towards a similar goal. Green human capital minimizes operating expenses while retaining talents. By conducting theright practice, employees' job satisfaction and dedication can potentially increase productivity. Therefore, green human capital can be defined as the summation ofemployees' competencies, experience, attitudes, creativities, and commitments about environmental protection or green innovation.
2	Businesses should "provides employees with the needed knowledge about the environmental policy of a company, its practices, and necessary attitudes" via green training. It is the responsibility of employers to equip employees with necessary skills and knowledge in driving the workforce to promote environmental protection awareness.
3	To increase on the availability of green human capital, employers should preparethe scope of green tasks while assessing the skill gaps among employees to propose suitable training programs in addressing the gaps. Encourage staff to communicate transparently and prevent protocols to provide feedback to the upper management. Carry out survey to solicit feedback on the newpolicies and programs implemented. Conduct internal tour for employees aroundthe premise to identify areas that need improvement on environmental impact.
4	Staff are becoming more complex and may be reluctant in shifting their mindsets.The role of the employer has become increasingly important where their principlesand practices should be exemplary to their subordinates. As practicing green involves the changing of culture in the organization, employers should walk throughemployees every change and decision made to protect the environment. This eventually fosters the camaraderie among the top and bottom levels while strengthening the company's culture.
5	Employers should also advocate in providing a safer and cleaner workplace, as aresult of practicing green. Further, green practices should also create a healthierwork environment as generally, the air and water quality improve. As hospitality and human touch are the main product of the services industry, highly motivated and satisfied employees tend to provide better service quality to the customers. This, therefore, leads to a win-win situation where business operators and employees gain.
6	The success of every implementation should be rewarded promptly and accordingly.Achievements should be publicized to staff and customers for recognition. Reward employees monetarily and/or provide incentives to boost their morale. Documenttheir success and best practices for future collaboration and knowledge sharingsessions.



ASSESSMENT AND EVALUATION

Organizations need to understand the specific tool to assess and evaluate their performance on the indicators that serve as a guideline for them to control their damage to the environment. The suggested tool for material is shown below:

F. Management	
1. Policy and Program	
1	Design policies and program for green practices. - Short term (less than 3years) - Medium term (3- 5 years) - Long term (more than 5 years)
2	Plan roadmap and implementation strategy for new green policies and programs
3	Comply with all applicable local, national, and international legislation and regulations.
4	Include in the policy that reward/incentivize staff for best practices on the green.
5	Apply relevant analysis and management tools to monitor the implementation of green policies and programs.
2. Green Procurement	
1	Conduct open tender and background check for procurement.
2	Engage local businesses on green products for partnerships on bulk orders.
3	Adhere to the green procurement policy and procedures
4	New products comprise of are ethically sourced, fair-trade, biodegradable or recyclable, and that have minimal packaging. - Target -___% - Current year value -_____% - Previous year value -_____%
5	Record purchases and supplies based on department. - Target -___% - Current year value -_____% - Previous year value -_____%
3. Green Procurement	
1	Train employees with the needed knowledge about the environmental policy of a company, its practices, and necessary attitudes. - Module for existing employees (more than 5 years) - Module for new employees
2	Skill gap assessment among employees on green practices.
3	Allow staff to communicate and provide feedback to the management.
4	Conduct internal tours annually for employees around the premise to identify areas that need improvement on environmental impact.
5	Create awareness by providing training on safe and clean workplace
6	Acknowledge achievement and success of best green practices by staffpublicly.
7	Promote a decent work among the employees in the workplace

CASE STUDIES

1. The Frangipani Langkawi

The Frangipani Langkawi
Resort & Spa

This hotel highlights various green practices and the proprietor has introduced many green initiatives to protect the environment such as the open-air concept for the restaurant, lobby, recycled materials for a public toilet, and spa-center. Some examples are shown below:

While most kitchens are generally considered very hot, this resort's kitchen ventilation reduces heat by 3°C which is much cooler. Mosquito netting is placed at the kitchen's back door to allow cool air to enter the kitchen without opening the door.

The resort has 120 poly tanks, each able to harvest up to 4000 liters of rainwater. Water is collected during the rainy season to be used in the dry season. The rainwater is collected from the rain gutter and goes through the first poly tanks. Then, through a small filtration system connected to a second tank, the water is ready for use. Uses of the rainwater include cleaning the public pathways, irrigation purposes as well as to flushing toilets.

2. KOMTAR Tower, Penang

Komtar Tower in Penang is also practicing green activities in terms of energy conservation. The TOP Komtar Penang Skywalk is the highest iconic entertainment with exclusive restaurants. Engineers proposed several alternatives to reduce OTTV to promote better comfort and better energy conservation.

OTTV CALCULATION FOR KOMTAR TOWER (Solution 05)

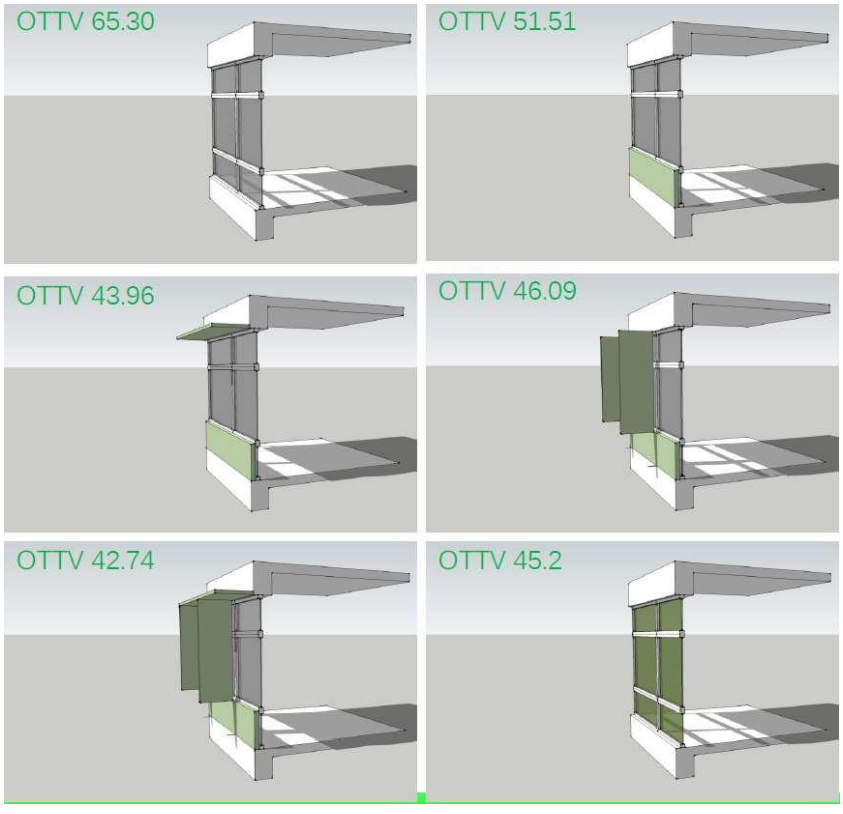
Wall - White Painted Clay Bricks Wall (U-Value = 2.70W/m2k)

Galzing - 6mm thick Single Glaze Grey Tinted Glass (U-value = 5.90W/m2k; SC = 0.58)

Solution 05: Change glaze spec to 6mm Single Glaze Low E (U-value = 4.0W/m2k; SC = 0.38)

OTTV Calculation

	ELEVATION	Facade Area (A) m^2	Window Area m^2	Constant	Solar Absorption Factor (α)	Window to Wall Ratio (WWR)	(1-WWR)	U-Value W/m^2k (Uv)	Orientation Correction Factor (CF)	Shading Coeff of Galzing, SC1	Shading Coeff of Ext. Shading Device SC2	Shading Coeff (SC = $SC_1 x SC_2$)	Termal Transfer Value (OTTV)	A x OTTV
HEAT CONDUCTIOPN THROUGH WALL	NORTH WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	NORTH-EAST WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	EAST (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	SOUTH-EAST WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	SOUTH WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	SOUTH-WEST WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	WEST WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	NORTH-WEST WALL (brickwall, white)	2974	1188	15	0.25	0.40	0.60	2.70	-	-	-	-	6.08	18,067.05
	TOTAL WALL OTTV	23792	**15 X α X (1-WWR) U**											144,536.40
HEAT CONDUCTIOPN THROUGH WINDOWS	NORTH WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	NORTH-EAST WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	EAST WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	SOUTH-EAST WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	SOUTH WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	SOUTH-WEST WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	WEST WINDOW (Single glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	NORTH-WEST WINDOW (Signle glaze, low E)	2974	1188	6	-	0.40	-	4.00	-	-	-	-	9.60	28,550.40
	TOTAL WINDOW OTTV		**6 X WWR X U**											228,403.20
SOLAR HEAT GAIN THROUGH WINDOWS	NORTH WINDOW - No Shading	2974	1188	194	-	0.40	-	-	0.90	0.58	1.00	0.38	26.54	78,927.58
	NORTH-EAST WINDOW - No Shading	2974	1188	194	-	0.40	-	-	1.09	0.58	1.00	0.38	32.14	95,590.07
	EAST WINDOW - No Shading	2974	1188	194	-	0.40	-	-	1.23	0.58	1.00	0.38	36.27	107,867.69
	SOUTH-EAST WINDOW - No Shading	2974	1188	194	-	0.40	-	-	1.13	0.58	1.00	0.38	33.32	99,097.96
	SOUTH WINDOW - No Shading	2974	1188	194	-	0.40	-	-	0.92	0.58	1.00	0.38	27.13	80,681.53
	SOUTH-WEST WINDOW - No Shading	2974	1188	194	-	0.40	-	-	0.90	0.58	1.00	0.38	26.54	78,927.58
	WEST WINDOW - No Shading	2974	1188	194	-	0.40	-	-	0.94	0.58	1.00	0.38	27.72	82,435.47
	NORTH-WEST WINDOW - No Shading	2974	1188	194	-	0.40	-	-	0.90	0.58	1.00	0.38	26.54	78,927.58
	TOTAL SOLAR HEAT GAIN		**194 X CF X WWR XSC**											702,455.47
	OVERALL BUILDING OTTV	23792											**45.20**	1,075,395.07



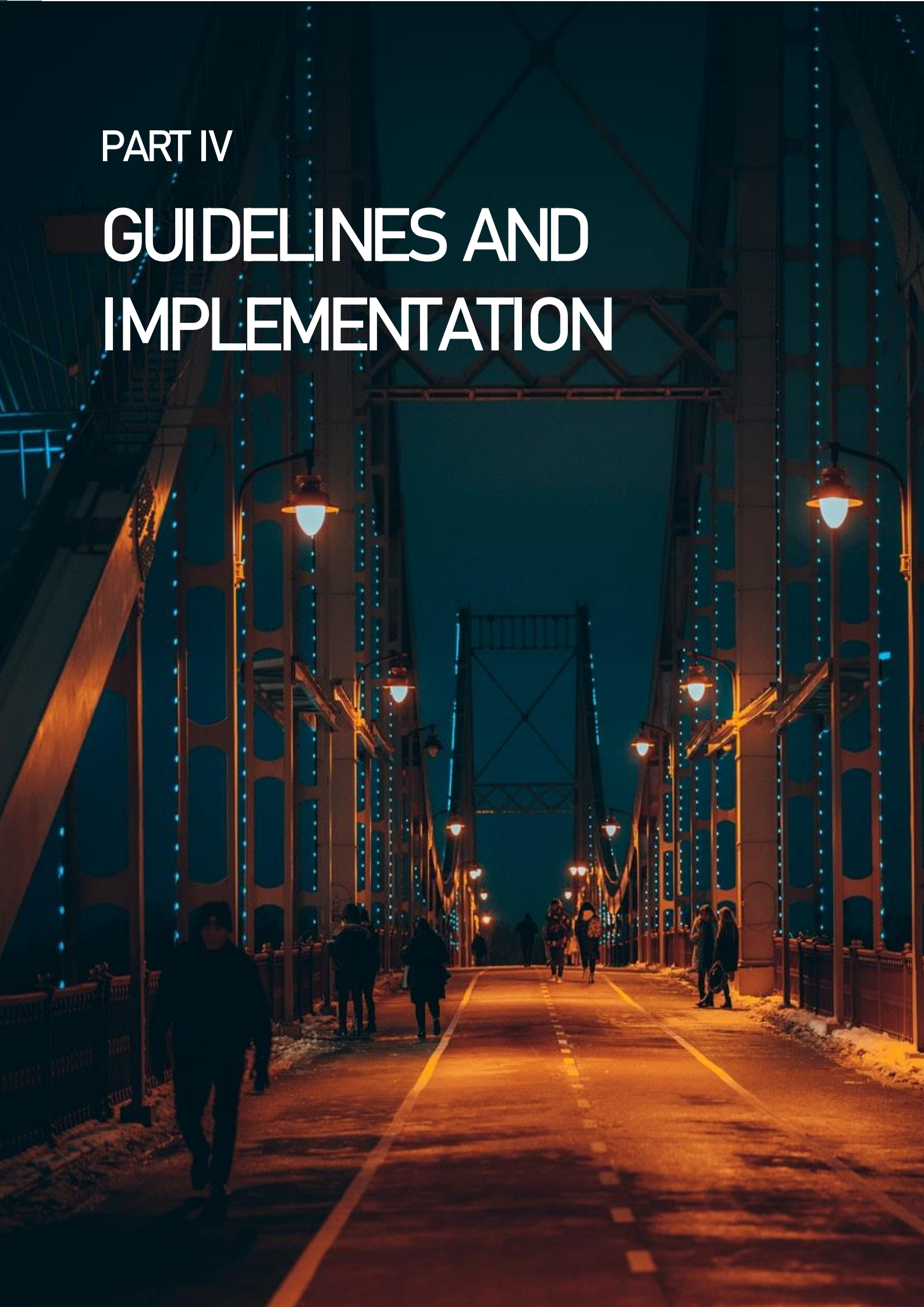
3. Four Seasons, Chiang Mai

FOUR SEASONS

This is another example outside Malaysia in which “The Four Seasons Chiang Mai utilizes a wastewater treatment plant from which water is pumped into the resort’s gardens and to its rice fields, where a family of water buffalo grazes. The rice is harvested three times a year and collected in a barn for donation to local charities and temples.”

Take Me Home Tomatoes: Grown in greenhouses 10 minutes away from the Resort, Take Me Home Tomatoes are vine-ripened, juicy, and freshly picked, every day the hotel helps local farmers produce A-grade tomatoes which are used in their kitchen. In addition, the hotel also serves food from the ‘mountain fresh’ is the organic certified vegetable from the hills, Mountain Fresh, which is in the Samoeng district, 40 minutes away from the Resort. With a pollution-free and natural untouched environment, all the freshest vegetables come straight from local farmers, with a focus on quality farming practices.


Plan A
Plan B
Marketing Strategy



PART IV

GUIDELINES AND IMPLEMENTATION

PART 4: GUIDELINES AND IMPLEMENTATION

4.1 Preparation and Target Setting

The organization must start by setting the objectives and targets based on the general understanding of all the positive and negative environmental impacts of the existing processes, operations, equipment, materials, waste, and facilities. In developing the action plan and implementation strategy, the specific actions must be detailed accordingly to include the specific goals, the division of tasks and responsibilities, timeline, and resources. Additionally, appropriate communication and a motivating system are created to ensure that the aims of the green practices can be achieved in a timely and successful manner.

Once objectives are identified, the organizations should determine the indicators as discussed above and align these indicators with the targets and objectives selected previously. Once specific indicators are selected, the data collection method and expected outputs must be determined before proceeding to the next stage which involves the actual measurement of the indicators and performance assessment. The guideline describes the recommendations and proposed actions that the organizations can adopt to implement green practices in their daily operations. The development of guidelines is pertinent for the green module establishment for the stakeholders to understand further green practices. This is driven by the eventual development of a Green Certificate which recognizes the green practices in the industry. A Green Certificate Roadmap is proposed below, and this roadmap is developed to ensure that the Green Industry is facilitated in implementing the green practices.

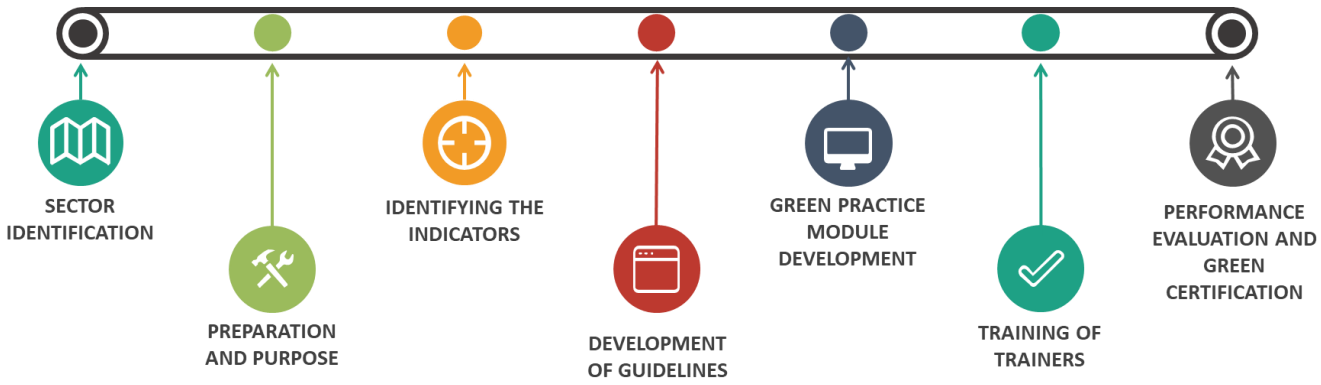


Figure 4.1: Green Recognition and Certificate Roadmap

It is envisioned that organizations that have implemented green and best practices in the industry may apply for the Green Certificate, which is recognized by the Government of Malaysia, hence being eligible for, as of now, proposed financing benefits and support. In summary, the steps outlined below can be applied to develop actions and implementation plans in applying green practices in the services sector by focusing on six main indicators namely materials, waste, water, energy, innovation, and management. Therefore, it is recommended for users of this Guideline to utilize the five (5) steps as follows:

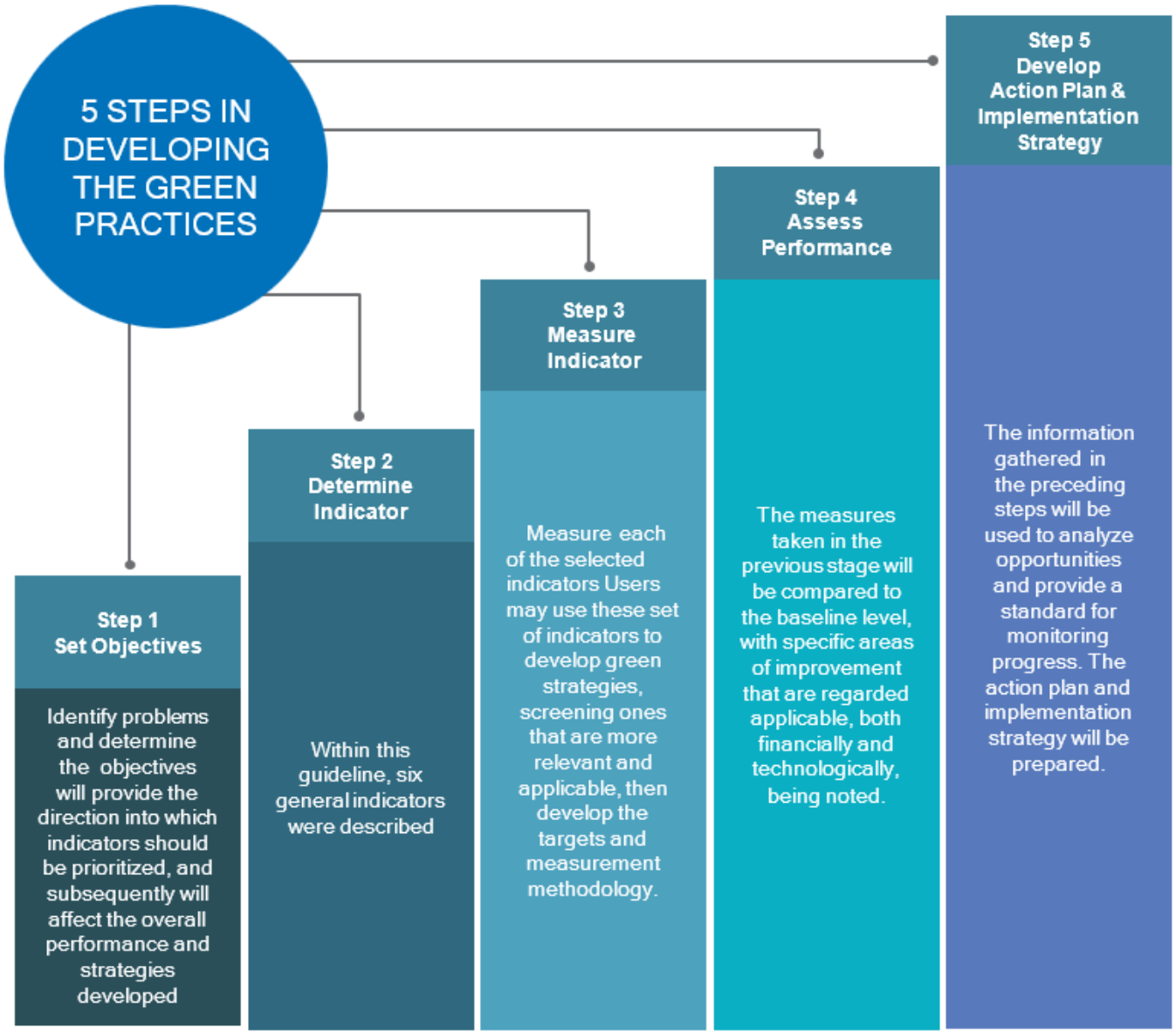
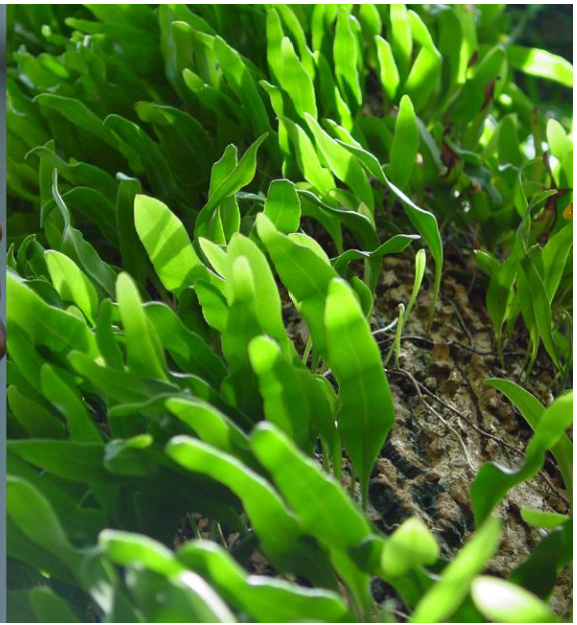
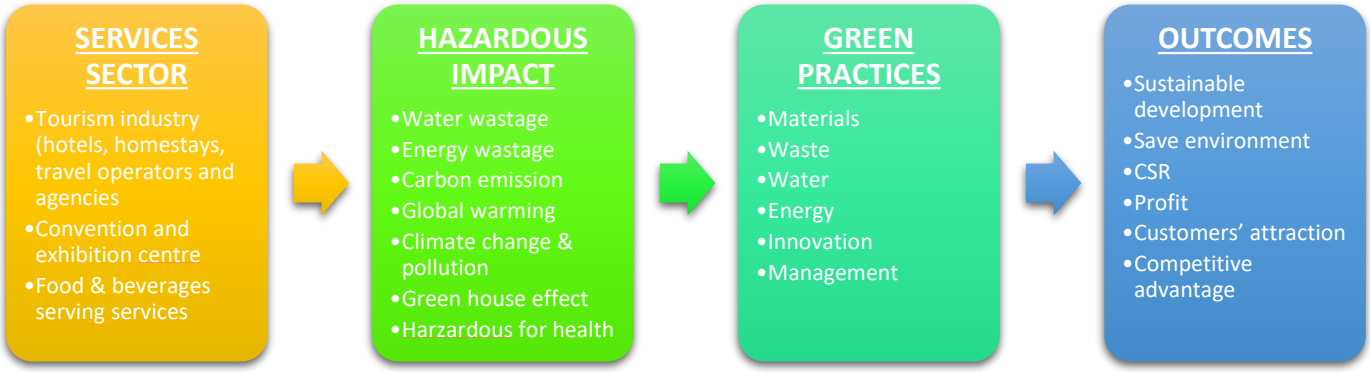


Figure 4.2: Steps for the Guidelines of the Green Practices

In the nutshell, the overall framework of these guidelines is to show how the adoption of green services, a service organization can achieve its motives and can be helpful in environment protection as well as sustainable development. It highlights the trajectory path for helping the environment and saving the earth. Figure 4.3 summarizes the process.

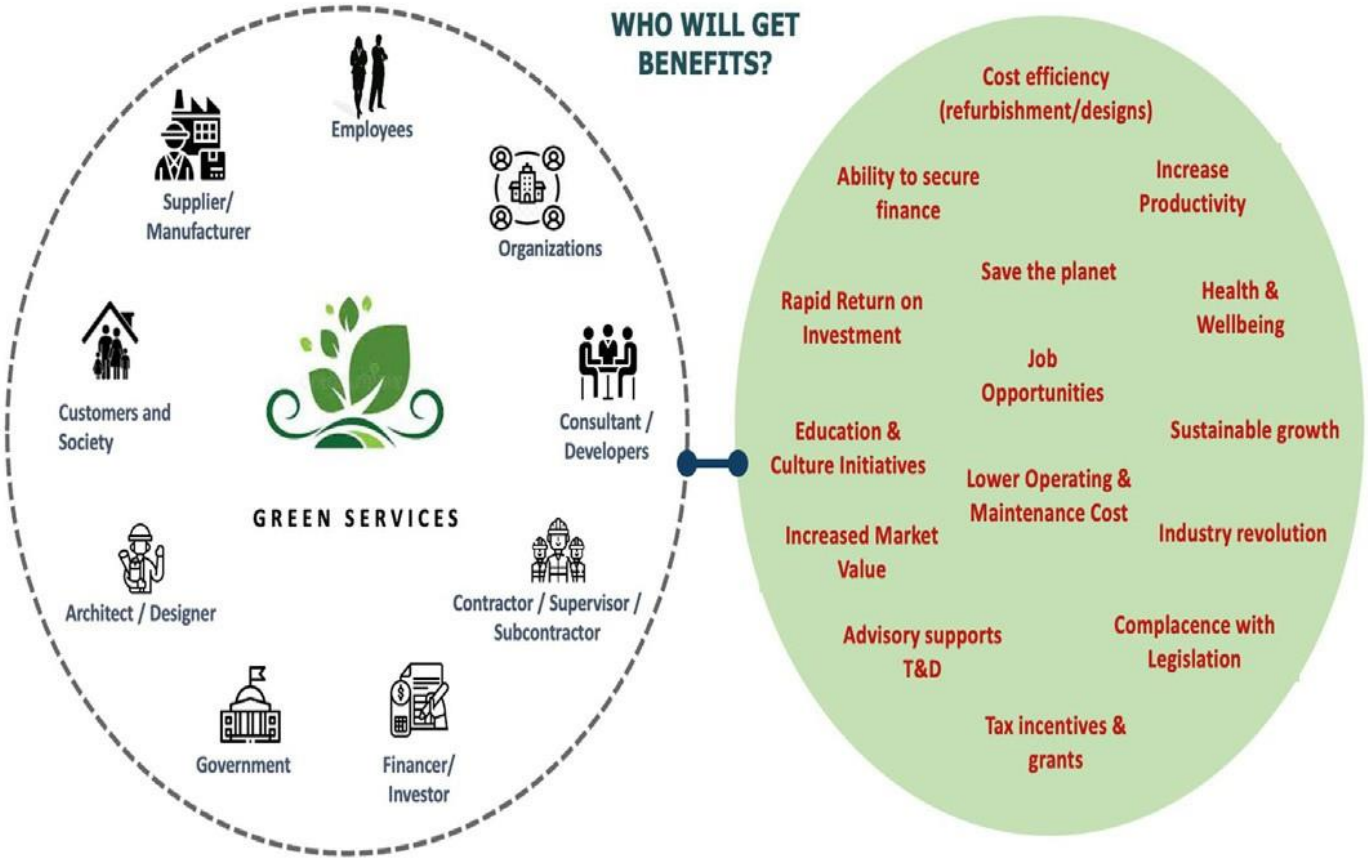




This green practice guideline provides a platform for a service organization to understand in detail on the green activities and the importance of engaging with green practices. The greening of services has become a necessity and is not limited to some sectors or not just a marketing strategy, but it should be a compulsion to embrace these kinds of practices to survive. It is time for the service sector to accept green practices so that the environment can be procured for the upcoming generation.

4.2 Benefits of Green Services Practices

The practice of green is hoped to provide substantial benefits to the users. In summary, the illustration below describes who will benefit from the guideline and in what form the guideline advantage various stakeholders in the services sector.



In the nutshell, the overview of the process to obtain the Green Recognition is summarized in the illustration below. This illustration demonstrates the purpose, the barriers, challenges, and the benefits of green practices among the services sectors. Green services could be achieved by adhering to the indicators and sub-indicator for green initiatives. Eventually, green certification is obtained once the services sector can understand and abide by the requirements of the indicators on green activities.

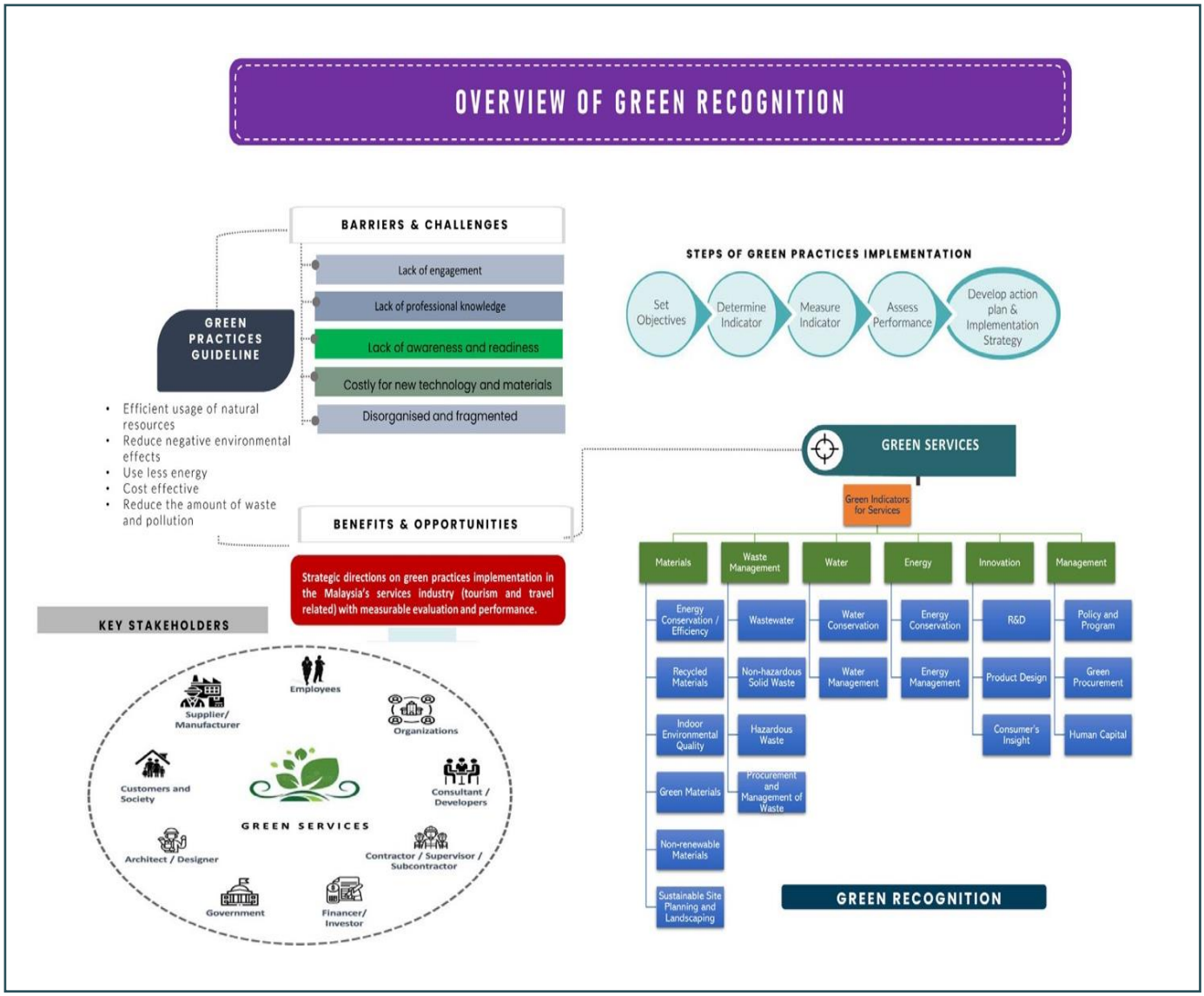


Figure 4.2: Overview of the Process for Green Recognition

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