GREEN PRACTICES
GUIDELINE FOR

FOREST OPERATION
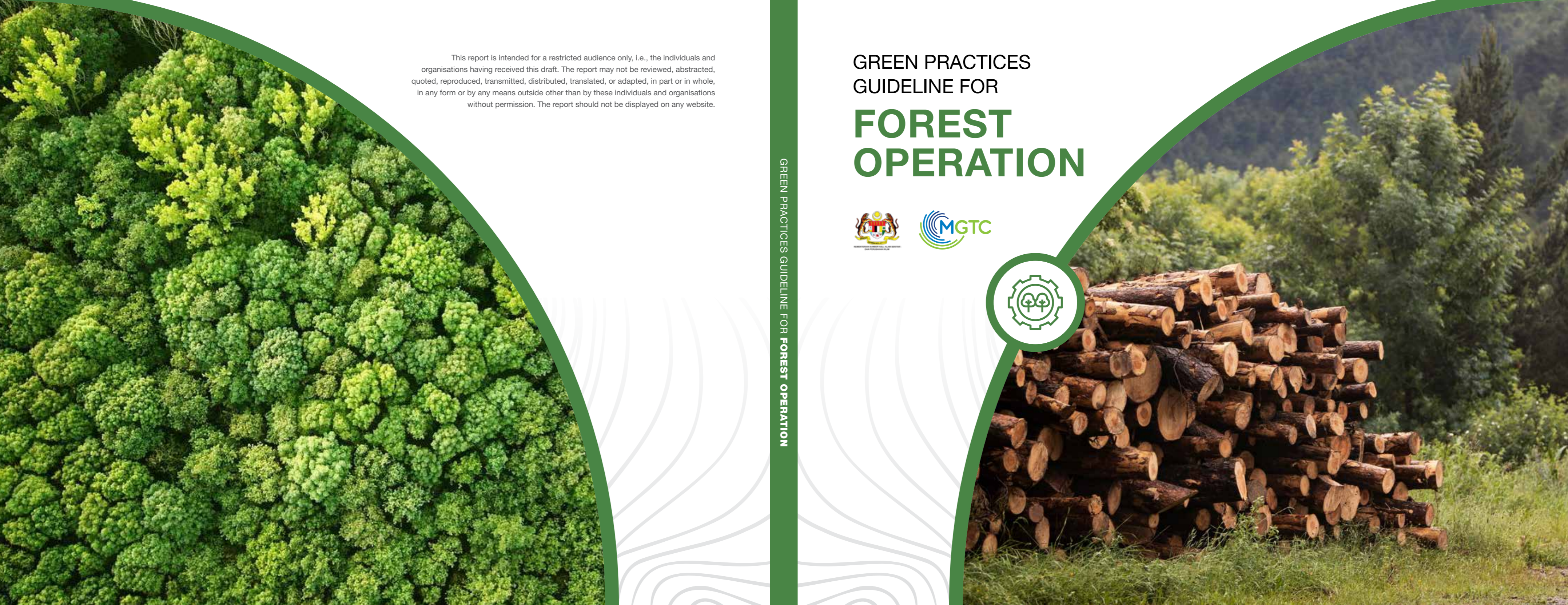
GREEN PRACTICES GUIDELINE FOR
FOREST OPERATION

Malaysian Green Technology And Climate Change Corporation

ABBREVIATIONS

ABBREVIATION	
SMS	Selective management system
ESG	Environmental, social, and governance
RIL	Reduced impact logging
SIA	Social impact assessment
FAO	Food and Agriculture Organisation
ITTO	International Tropical Timber Organisation
IUFRO	International Union of Forest Research Organisations
UNEP	United Nations Environment Programme
IUCN	International Union for Conservation of Nature
MTCS	Malaysian Timber Certification Scheme
MTTC	Malaysian Timber Certification Council
PEFC	Programme for the Endorsement of Forest Certification
MC&I SFM	Malaysian Criteria and Indicators for Sustainable Forest Management
FCS	Forest Stewardship Council
GITA	Green Investment Tax Allowance
GITE	Green Income Tax Exemptions
NGTP	National Green Technology Policy
LCCF	Low Carbon Cities Framework
EMGS	Energy Management Gold Standard

TERMINOLOGIES

FOREST OPERATIONS

are the specific activities implemented to achieve a stakeholders desired forest use. Typically, these activities involve harvesting timber, include constructing roads and other facilities.

GREEN PRACTICES

are an environmentally friendly practice in forest harvest operations and how they are perceived practically in environmental sound ways.

GREEN AGENDA

is an institutional movement related to or are concerned with the protection of the environments.

GREEN TECHNOLOGY

Definition by MGTC: The development and application of products, equipment and systems used to conserve the natural environment and resources, which minimises and reduces the negative impact of human activities.

GOOD PRACTICES

are the effort to maintain and improve the environmental values of forests associated with soils, water, and biological diversity. These practices are often used during and following the harvesting of timber.

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FOREWORD

The development of green practice guidelines is a continuation of the implementation of the MyHIJAU Programme 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 programme 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 organisations 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 eight main focus which is to accelerate green growth, where this green practice development programme 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.

ABOUT
THE GUIDELINE

The Green Practices Guideline was officially endorsed by the Ministry of Environment and Water in 2021 as part of the Twelfth Malaysia Plan (RMKe-12) under SDG 12.6. This particular goal aims to promote the adoption of sustainable practices and the integration of sustainability information into the reporting cycle of companies.

This governmental initiative strongly aligns with Malaysia's commitment to fostering green technology policies and driving sustainable development across various industries and organisations within the country.

The initial implementation of the Guideline primarily focuses on enhancing exposure, perception, knowledge, and capacity building regarding green resources, processes, and technologies. Collectively known as "green practices," these measures are intended to drive positive changes within the industry.

The envisioned outcome of implementing green practices in the industry is the promotion of cleaner, more efficient, and environmentally-friendly operations, processes, and premises throughout Malaysia.

KEY POINTS:

Mandate : The Ministry of Environment and Water granted approval through the Twelfth Malaysia Plan (RMKe-12) in 2021.

Green Policy : The Guideline supports the advancement of green technology policies to facilitate sustainable development within industries and organisations in Malaysia.

Purpose : To provide guidance and recommendations for forest operation industries in the implementation of green practices.

Approach : The Guideline emphasises the optimisation of natural resource consumption, energy usage, and water management, while concurrently reducing toxic emissions and waste generation.

Optimise : Focus on optimising the consumption of natural resources, including raw materials, water, energy, and land use.

Circularity : Encourage the adoption of circular economy principles by increasing the reuse, recycling, and reduction of materials, energy, and water.

Reduce : Place emphasis on reducing the emissions of toxic or hazardous waste.

Implement : Promote the utilisation of innovative green technologies to enhance processes and operations.

INTRODUCTION

1

PART 1: INTRODUCTION

1.1 ABOUT THE SECTOR

THREE CRITICAL PARAMETERS FOR SUSTAINABLE FOREST DEVELOPMENT

PRODUCTIVE CAPACITY

Site productivity is a function of the number of species and individual trees growing on a location, soil fertility and climate.
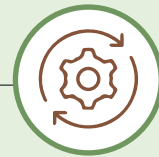
RENEWAL CAPACITY

Renewal of a forest ecosystem, following harvesting or other forms of disturbances, is dependent on the nature and intensity of disturbance and the mode of reproduction of species located on the site.
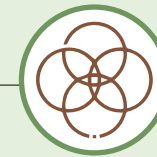
SPECIES AND ECOLOGICAL DIVERSITY

Forests are a rich repository of planet Earth's genetic heritage. Tropical forests contain more than 50 percent of all plant and animal species in about six percent of the world's surface area. Species diversity and ecological diversity are closely related, and their preservation is an integral component of efforts to maintain future options.

The Green Practices Guideline for Forest Operations serves as a reference document to assist industries in achieving the objectives outlined in the Green Technology Master Plan. The government of Malaysia is dedicated to maintaining at least 50% of the country's landmass under forest cover, as pledged during the 1992 Earth Summit in Rio de Janeiro, Brazil. Currently, 55.3% of Malaysia's land area, equivalent to 18.27 million hectares, is covered by forests.

As part of the greening Malaysia agenda, there is a particular emphasis on enhancing forest conservation through tree planting, rehabilitation, and restoration of degraded forest areas in collaboration with state governments. To support these efforts, special financial instruments have been established, including the National Conservation Trust Fund for Natural Resources and Forest Development Trust Fund under the state governments in Peninsular Malaysia, as well as the Malaysia Forest Fund (MFF).

It is crucial to establish a clear understanding of the definition of a forest in the context of this guideline. A forest is defined as an area of land with a minimum size of 0.5 hectare and a tree crown cover (or equivalent stocking level) of at least 30%, consisting of trees with the potential to reach a minimum height of 2-5 meters at maturity in situ. Forests can be classified as closed forest formations, where trees of various storeys and undergrowth cover a significant proportion of the ground, or open forests. This definition includes young natural stands and plantations that have yet to reach a crown density of 10-30% or a tree height of 2-5 meters.

Sustainable forest development is a critical goal within the concept of sustainable development and green technology. Forests are resilient ecosystems, but they have limits to their ability to withstand environmental changes. When these limits are exceeded, forests degrade. Therefore, sustainable forest development involves recognising the limitations of forests to withstand environmental change and managing human activities to maximise benefits within these limits. The three critical parameters of sustainable forest development are productive capacity, renewal capacity, and species and ecological diversity.

It is important to differentiate forest operations from logging activities. Forest operations encompass all technical and administrative processes involved in developing technical facilities and structures, harvesting timber, and maintaining and improving the quality of forest stands and habitats. Harvesting, a key activity in forest operations, includes all operations from felling to transporting logs to the mill. Forest operations management plays a crucial role in ensuring sustainable practices and optimising the utilisation of forest resources.

The Green Practices Guideline for Forest Operations provides recommendations and proposed actions to promote sustainable practices within the manufacturing sector. By implementing these green practices, the forest industry can contribute to the preservation and responsible management of Malaysia's forests, supporting the goals of the Green Technology Master Plan and ensuring a sustainable future for generations to come.

FOREST OPERATIONS IN CONTEXT

01 TECHNICALLY FEASIBLE

Considering physical law, engineering knowledge, and environmental relationship of the forest ecosystem

02 ECONOMICALLY VIABLE

Considering the cost and benefit of short-ranges and long-range consequences

03 ENVIRONMENTALLY SOUND

Considering impacts on the natural and social environment, efficient use of natural resources including renewable materials, non-renewable materials, water, energy and space

04 INSTITUTIONAL FEASIBLE

Considering the law and regulations governing operations, forest management objectives and social values

1.2   SCOPE AND APPLICATION

The Green Practices Guidelines for Forest Operations serve as a comprehensive reference document to assist industries in the forest sector in implementing sustainable and environmentally friendly practices. These guidelines are specifically tailored to the context of forest operations in Peninsular Malaysia and provide valuable guidance on how to conduct forest activities in an environmentally sound manner.

The scope of the guidelines covers key thrusts in forest operations, including forest road construction, tree felling, extraction, transportation operations, river buffer zones, log yard/landing operations, and forest camp management. By addressing these thrusts, the guidelines ensure that forest operations are conducted with careful consideration of environmental impacts and sustainability principles.

In line with the objectives of the Green Technology Master Plan (GTMP), these guidelines promote the integration of green practices in the forest sector to achieve sustainable forest management. They take into account the social, financial, and policy barriers that may hinder the implementation of green initiatives in the forest industry and provide recommendations to overcome these challenges.

The guidelines emphasise the importance of institutional integration and supportive policies to foster collaboration between government and non-government stakeholders in the forest sector. By incorporating these green practices, industries can contribute to the conservation and sustainable use of Malaysia's forest resources, protecting biodiversity and maintaining ecosystem services.

By following the Green Practices Guidelines for Forest Operations, stakeholders in the forest sector can enhance productivity while minimising environmental impact. These guidelines provide a roadmap for implementing responsible practices that balance economic, social, and environmental considerations in forest operations. By doing so, the forest sector can contribute to the preservation of Malaysia's forests and support the long-term sustainability of the industry.

The Green Practices Guidelines for Forest Operations are aimed at promoting sustainable forest management and minimising environmental impact in the forest sector of Peninsular Malaysia. These guidelines address various aspects of forest operations to ensure that activities are conducted in an environmentally sound and socially responsible manner.

The guidelines focus on key thrusts in forest operations, including forest road construction, tree felling, extraction, transportation operations, river buffer zones, log yard/landing operations, and forest camp management. By providing specific recommendations for each thrust, the guidelines offer practical solutions for implementing green practices at each stage of forest operations.

In line with the Green Technology Master Plan (GTMP), the guidelines highlight the importance of integrating green practices into forest operations. They emphasise the need for collaboration among stakeholders, including government agencies, industry players, and local communities, to collectively work towards sustainable forest management goals.

The guidelines also underscore the significance of responsible resource utilisation and conservation. They encourage the adoption of sustainable harvesting techniques, the protection of river buffer zones, and the proper management of log yards and forest camps to minimize negative impacts on ecosystems and biodiversity.

By following the Green Practices Guidelines for Forest Operations, industry players can enhance their environmental performance, reduce their carbon footprint, and contribute to the overall sustainability of the forest sector. These guidelines provide a framework for responsible decision-making, improved operational efficiency, and the preservation of forest resources for future generations.

Ultimately, the implementation of green practices in forest operations is crucial for maintaining the ecological integrity of Malaysia's forests, preserving biodiversity, and ensuring the sustainable use of forest resources. The guidelines serve as a valuable tool to guide industry players in adopting environmentally friendly practices, fostering a harmonious relationship between forest operations and the natural environment.

1.3 MOTIVATION TO SUSTAINABILITY

Sustainability is paramount in the forest operation sector, as it plays a vital role in balancing economic development with environmental preservation. Forest operators must prioritise sustainable practices to protect ecosystems and unlock a range of benefits that contribute to long-term success and competitiveness.

ENVIRONMENTAL STEWARDSHIP:

Forest operators have a responsibility to be environmentally conscious. By adopting sustainable practices, they can minimise their ecological footprint, reduce pollution, and conserve natural resources. Demonstrating environmental stewardship showcases a commitment to preserving forest ecosystems and supports global efforts to combat climate change.

COST EFFICIENCY:

Sustainable forest operations often result in long-term cost savings. Implementing energy-efficient equipment and processes, reducing waste, and practicing responsible water management can lower operational expenses and enhance financial resilience. Embracing sustainable supply chain practices improves resource efficiency, reducing material and transportation costs.

MARKET DEMAND AND REPUTATION:

The demand for sustainably sourced forest products is growing. Embracing sustainability in forest operations allows companies to tap into the market demand for eco-conscious and socially responsible products. A strong commitment to sustainability enhances reputation, builds trust with stakeholders, and fosters brand loyalty.

REGULATORY COMPLIANCE AND MARKET ACCESS:

Sustainable forest practices align with and exceed environmental regulations. Proactively complying with regulations and anticipating future requirements helps companies avoid fines and legal issues. Adhering to sustainability standards opens access to international markets with stringent environmental requirements, expanding reach and export opportunities.

INNOVATION AND COMPETITIVENESS:

Sustainability drives innovation in the forest operation sector. Companies investing in green technologies and sustainable practices gain a competitive edge. By exploring new technologies and approaches, forest operators can improve efficiency, reduce environmental impact, and adapt to evolving market needs.

EMPLOYEE ENGAGEMENT AND PRODUCTIVITY:

Commitment to sustainability enhances employee morale and engagement. Working for environmentally responsible organisations is a source of pride for employees. Companies prioritising sustainability attract and retain top talent, leading to increased productivity and job satisfaction.

RESILIENCE TO CLIMATE RISKS:

Incorporating sustainability practices in forest operations builds resilience to climate-related risks. Strategies to mitigate and adapt to climate change impacts, such as wildfires or changing weather patterns, ensure business continuity and protect forest resources.

By embracing sustainable practices in forest operations, companies contribute to a more environmentally conscious industry while benefiting from cost efficiency, market demand, regulatory compliance, innovation, employee engagement, and resilience to climate risks. These efforts position forest operators as leaders in sustainability, driving positive change and shaping a more sustainable future for the industry.

1.3.1 CLIMATE CHANGE

Climate change presents a pressing challenge, emphasising the need for sustainable development in the forest operation sector. It is essential to balance economic growth with environmental preservation for the benefit of present and future generations.

In Malaysia, the forest operation sector contributes to the country's greenhouse gas (GHG) emissions. As part of Malaysia's commitment to climate action, the nation aims to become a low-carbon economy by 2050. Forest operators have a crucial role to play in mitigating climate change impacts. Some specific examples include:

1 FOREST CONSERVATION:

Forest operators can actively participate in forest conservation efforts by implementing sustainable forest management practices. This includes promoting forest regeneration, protecting biodiversity, and maintaining healthy forest ecosystems to sequester carbon and reduce GHG emissions.

2 SUSTAINABLE LOGGING PRACTICES:

Adopting sustainable logging practices minimises the environmental impact of timber harvesting. This involves selectively harvesting mature trees, following approved logging plans, and adhering to regulations that promote sustainable forest operations.

3 REFORESTATION AND AFFORESTATION:

Forest operators can contribute to climate change mitigation by engaging in reforestation and afforestation initiatives. This includes planting trees in deforested or degraded areas to enhance carbon sequestration, restore ecosystem functions, and promote sustainable land use.

4 RENEWABLE ENERGY INTEGRATION:

Embracing renewable energy sources within forest operations reduces reliance on fossil fuels. Forest operators can utilise solar panels, wind turbines, or biomass energy systems to power their facilities, reducing GHG emissions and promoting a sustainable energy transition.

5 COLLABORATION AND KNOWLEDGE SHARING:

Engaging in collaborations and partnerships with relevant stakeholders, including government agencies, research institutions, and local communities, fosters knowledge sharing and promotes sustainable forest practices. Collaborative efforts can lead to the development and implementation of innovative solutions for climate change mitigation and adaptation.

6 CERTIFICATION AND TRACEABILITY:

Seeking certification through recognized forest management schemes, such as Forest Stewardship Council (FSC) certification, ensures adherence to sustainable practices. Certification provides assurance to consumers and stakeholders that forest products are responsibly sourced, contributing to climate change mitigation and supporting market demand for sustainable timber products.

By embracing sustainable practices in forest operations, companies can contribute to Malaysia's climate goals, reduce environmental impact, and demonstrate leadership in the industry. These efforts align with global sustainability objectives, enhance reputation, attract responsible buyers, and ensure the long-term viability of forest operations in an environmentally conscious world.

ENERGY INDUSTRIES:
ELECTRICITY AND HEAT PRODUCTION

39%

TRANSPORT:
ROAD TRANSPORTATION

21%

MANUFACTURING INDUSTRIES AND CONSTRUCTION

9%

ENERGY INDUSTRIES:
NATURAL GAS TRANSFORMATION

7%

LAND CONVERTED TO SETTLEMENTS

7%

ENERGY INDUSTRIES:
PETROLEUM REFINING

4%

CEMENT PRODUCTION

3%

OTHERS

5%

TRANSPORT:
DOMESTIC WATER BORNE NAVIGATION

2%

OTHER PROCESS USES OF CARBONATES

2%

PETROCHEMICALS & CARBON BLACK 1%

RENEWABLE ENERGY (RE)

FIT-IN-TARIFF

Mechanism under the Renewable Energy Policy & Action Plan to catalyse generation of Renewable Energy (RE) up to 30MW in size.

Emission avoidance:

460.52 Gg CO_2 eq

HYDROPOWER

Hydropower is poised to play an increasingly important role in meeting Malaysia's energy and climate goals.

Emission avoidance:

6,535.99 Gg CO_2 eq

NATIONAL ENERGY EFFICIENCY ACTION PLAN (NEEAP)

This plan was introduced targeting the residential, commercial and industrial sectors. Key initiatives under NEEAP:

- 5 star rated appliances
- Minimum Energy Performance Standard (MEPS)
- Co-generation
- Energy audits and energy management in buildings and industries
- Energy Efficient Building Design

Emission avoidance:

458.02 Gg CO_2 eq

ENERGY EFFICIENT VEHICLES (EEVs)

Malaysia aims to become a regional hub for energy efficient vehicles (EEVs) through strategic investments and adoption of high technology. The EEVs include fuel-efficient internal combustion engines (ICE) vehicles, electric vehicles, hybrid & alternative-fueled vehicles.

Related policy:

The National Automotive Policy 2014

Emission avoidance:

90.65 Gg CO_2 eq

GREEN BUILDING RATING SCHEME

Focus on promoting natural-gas vehicles in the public transport sector, in particular for taxis and buses.

EXISTING STANDARD:

- Malaysian Carbon Reduction & Environmental Sustainability Tools (MyCREST)
- Green Performance Assessment System (PASS)

GREEN CERTIFICATION:

- Green Building Index (GBI)
- GreenRE

Emission avoidance:

143.47 Gg CO_2 eq

URBAN RAILED-PUBLIC TRANSPORT

The implementation of public transport initiatives is important to reduce the use of private vehicles on the road.

Existing plan:

- National Land Public Transport Master Plan
- The Tenth and Eleventh Malaysia Plan

Emission avoidance:

212.93 Gg CO_2 eq

NATURAL GAS VEHICLES (NGVs)

Focus on promoting natural-gas vehicles in the public transport sector, in particular for taxis and buses.

Benefits of programme:

- Lower retail prices
- Incentives
- Road tax reduction
- Import duty and sale tax exemption

Emission avoidance:

114.77 Gg CO_2 eq

BIODIESEL

Biodiesel has received great attention as an alternative fuel, considering its abundant resources and environmental benefits.

Related policies and Acts:

- The National Biofuel Policy
- Malaysian Biofuel Industry Act

Emission avoidance:

1,127.34 Gg CO_2 eq

OIL & GAS OPERATIONS

PETRONAS, as the national oil and gas company of Malaysia is committed towards a loer carbon footprint.

Emission reduction in oil & gas operations can be achieved through:

- Zero continuous flaring and venting in all operations for fugitive emissions
- Continuous improvement and plant efficiency in natural gas transformation
- Enhance improvement in plant efficiency of oil refining industries

WASTE PAPER RECYCLING

Target of 40% waste redirection from waste disposal sites:

- 22% through recycling
- 18% through waste treatment

IMPACT:

Increase of recycling rate materials from 17% in 2015 to 21% in 2017.

RELATED POLICY:

- National Solid Waste Management Policy 2006
- Eleventh Malaysia Plan

Emission avoidance:

3,937.76 Gg CO_2 eq

BIOGAS RECOVERY FROM PALM OIL MILL EFFLUENT (POME)

- Biogas plays a crucial role in driving Malaysia that is moving towards adopting renewable energy and environmental sustainability.
- Target include equipping mills with biogas entrapment facilities to generate electricity for supply to the grid or for self-consumption.

IMPACT:

As of 2017, out of 454 palm oil mills, 104 of them were fully equipped with biogas capture facilities.

RELATED POLICY:

Entry Point Project – Developing Biogas Facilities at Palm Oil Mills

RELATED PROGRAMME:

Economic Transformation Programme 2010

AGRICULTURE

Malaysian Organic Scheme (SOM) or Malaysia Organic (MyOrganic) is a certification that recognises farms that practice good agricultural practices and organic farming based on Malaysian Standard MS 1529:2015.

IMPACT:

253 farms have been certified with MyOrganic certification with an area of 2,045.60 ha as for now.

SUSTAINABLE MANAGEMENT OF FOREST

Forest certification scheme that allow the annual allowable cut in the Permanent Reserved Forest (PRF) is capped at 85 m^3/ha for the period of tenth & eleventh Malaysia Plan.

IMPACT:

Malaysian Criteria and indicators for Forest Management Certification 2001.

Emission avoidance:

20,307.50 Gg CO_2 eq

CONSERVATION OF BIODIVERSITY AND ECOSYSTEM SERVICES

RELEVANT INITIATIVE:

Malaysia's Protected Area (PA) Network

TARGET:

Increase the Protected Area to at least 20% by 2025.

IMPACT:

Protected Area increased from 2.757 to 3.171 million ha between 2014 and 2016

FOREST ENRICHMENT PROGRAMMES

AIMS:

- Improve degraded forests sequestration capacity
- Enhance connectivity between forests through two distinct initatives

EXAMPLES:

- Central Forest Spine (CFS) Programme in Peninsular Malaysia
- Heart of Borneo (HoB) Programme in Sabah and Sarawak

1.3.2 CIRCULAR ECONOMY

The forest operation sector has a vital role to play in transitioning to a circular economy, which promotes resource efficiency, waste reduction, and sustainable growth. By adopting circular economy principles, forest operators can contribute to climate change mitigation, cost-effectiveness, and the conservation of natural resources. Here are key aspects and initiatives relevant to the forest operation sector in Malaysia:

1

POLICY AND REGULATORY FRAMEWORK:

The Malaysian government has implemented policies and regulations to support the shift towards a circular economy in the forest operation sector. These policies aim to transform the linear economy model into a sustainable circular model, reducing environmental impacts associated with forest operations.

2

WASTE MANAGEMENT AND RECYCLING:

Efficient waste management and recycling systems are essential for achieving a circular economy in the forest operation sector. Forest operators can adopt waste reduction strategies, promote the recycling of forest residues and by-products, and explore innovative methods for managing forestry waste.

3

PRODUCT DESIGN AND EXTENDED PRODUCER RESPONSIBILITY (EPR):

Promoting sustainable product design and implementing extended producer responsibility schemes are crucial in the transition to a circular economy. Guidelines integrating eco-design principles into forest products and timber processing are being established to minimize waste and optimise resource use. Exploring EPR policies ensures that producers take responsibility for the entire lifecycle of forest products, including their disposal and recycling.

4

SUSTAINABLE CONSUMPTION AND PRODUCTION:

Encouraging sustainable consumption and production patterns is essential for advancing the circular economy in the forest operation sector. Forest operators can adopt sustainable forest management practices, promote the use of certified timber, and explore ways to minimise resource consumption and waste generation during forest operations.

5

INNOVATION AND TECHNOLOGY:

Innovation and the adoption of advanced technologies play a significant role in the transition to a circular economy. Research and development efforts in Malaysia focus on sustainable forest management practices, eco-friendly timber processing technologies, and the utilisation of forest biomass for renewable energy. Collaborating with research institutions and industry partners facilitates the adoption of innovative solutions in the forest operation sector.

6

COLLABORATION AND STAKEHOLDER ENGAGEMENT:

Collaboration among stakeholders is essential for the successful implementation of a circular economy in the forest operation sector. Forest operators can engage with government agencies, forestry associations, local communities, and indigenous groups to foster partnerships, share knowledge and best practices, and promote sustainable forest management initiatives.

By embracing circular economy principles, the forest operation sector in Malaysia can optimise resource utilisation, minimise waste generation, and promote sustainable practices throughout the forest value chain. This transition will contribute to Malaysia's climate goals, enhance the economic viability of the sector, and ensure the long-term resilience of forest ecosystems.

1.3.3 IMPACTS OF ESG TOWARDS THE INDUSTRY

ESG ESG (Environmental, Social, and Governance) considerations are of utmost importance in the forest operation sector in Malaysia. As custodians of the country's valuable forest resources, the forest operation sector has a critical role to play in promoting sustainable practices that balance environmental stewardship, social responsibility, and effective governance. By integrating ESG factors into their operations, forest operators can ensure the long-term sustainability of Malaysia's forests while contributing to broader sustainability objectives. The following initiatives and measures specifically apply to the forest operation sector:

SUPPORTING SMALL AND MEDIUM ENTERPRISES (SMES):

The Ministry of Finance has outlined strategies to support SMEs in the forest operation sector in adopting ESG practices. These initiatives include implementing governance principles for forest-related entities and introducing specific financing measures such as low-carbon transition facilities and grants for NGOs and social enterprises. By empowering SMEs, these efforts aim to drive the adoption of ESG considerations throughout the sector.

ALIGNMENT WITH SUSTAINABLE DEVELOPMENT GOALS (SDGS):

Recognising the importance of the SDGs in guiding sustainable development, the establishment of the Malaysia Sustainable Development Goals Trust Fund (MySDG Fund) provides critical support for ESG efforts in the forest operation sector. This fund enables financing and investments aligned with the SDGs, promoting sustainable practices, social impact, and the conservation of forest ecosystems in forest projects.

MITIGATING ENVIRONMENTAL IMPACTS:

The forest operation sector faces environmental challenges such as deforestation, habitat degradation, and the loss of biodiversity. Adhering to ESG principles is vital to ensure the sustainable management of forests. Forest operators can focus on implementing sustainable practices, such as responsible logging techniques, reforestation efforts, and the preservation of critical habitats to mitigate environmental impacts and safeguard the ecological integrity of forest ecosystems.

ACCESS TO CLIMATE FINANCE:

Given the significant role of forests in climate change mitigation and adaptation, forest operators in Malaysia can explore climate finance opportunities to fund their climate-related actions. By aligning these actions with ESG frameworks, forest operators can access financial support to implement measures that enhance carbon sequestration, improve forest resilience, and contribute to national and international climate goals.

INVESTOR FOCUS ON ESG:

Investors are increasingly considering ESG factors when making investment decisions in the forest operation sector. Addressing areas such as sustainable forestry management, community engagement, and the protection of indigenous rights and livelihoods can attract investment, enhance reputation, and ensure compliance with ESG expectations. Forest operators that prioritise ESG considerations can build trust with investors, improve access to capital, and create long-term value.

ADOPTING GREEN TECHNOLOGIES:

Integrating green technologies into forest operations is essential for promoting sustainable practices and minimising environmental impacts. This includes utilising remote sensing technologies for accurate forest monitoring, adopting sustainable logging practices that prioritise biodiversity conservation, and implementing innovative approaches to maximise resource efficiency and minimise waste. By embracing green technologies, forest operators can enhance operational efficiency, reduce environmental footprints, and contribute to a greener and more sustainable forest operation sector.

By embracing ESG principles, the forest operation sector in Malaysia can improve its environmental performance, social responsibility, and governance practices. This ensures the long-term sustainability of forest resources, contributes to climate change mitigation, safeguards biodiversity, and supports the achievement of national and international sustainability goals.

1.3.4 SUSTAINABLE DEVELOPMENTS GOALS

The United Nations Sustainable Development Goals (SDGs) provide a comprehensive framework for sustainable development and offer specific targets and indicators to measure progress. In the forest operation sector in Malaysia, embracing the SDGs is crucial for addressing global challenges and achieving sustainable forest management. The sector can actively contribute to several SDGs by implementing sustainable practices and adopting green technologies. Here are specific examples:

SDG 6:
CLEAN WATER AND SANITATION:

Forest operators can prioritise the protection of water sources within their operations, implementing measures to prevent water pollution, such as establishing buffer zones along rivers and streams. They can also invest in efficient water management systems to minimise water usage and promote responsible water stewardship.

SDG 7:
AFFORDABLE AND CLEAN ENERGY:

Forest operators can harness renewable energy sources, such as utilising solar panels to power forest operation facilities and equipment. This reduces reliance on fossil fuels, lowers carbon emissions, and contributes to clean energy generation.
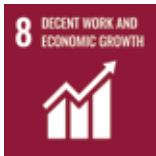
SDG 8:
DECENT WORK AND ECONOMIC GROWTH:

The forest operation sector can promote decent work by providing safe and fair working conditions for forest workers, ensuring fair wages, and offering training and capacity-building opportunities. By fostering a supportive and inclusive work environment, the sector contributes to economic growth and the well-being of forest-dependent communities.

SDG 9:
INDUSTRY, INNOVATION, AND INFRASTRUCTURE:

Adopting innovative technologies and sustainable forest management practices enables the sector to enhance resource efficiency, minimise environmental impacts, and develop resilient forest infrastructure. This includes utilising advanced forestry equipment, implementing remote sensing technologies for forest monitoring, and adopting sustainable logging techniques.

SDG 11:
SUSTAINABLE CITIES AND COMMUNITIES:

Through responsible forest management, the sector contributes to the preservation of forest ecosystems that provide essential services to nearby communities. By protecting forests, maintaining biodiversity, and supporting sustainable livelihoods, forest operators contribute to the development of sustainable communities.

SDG 12:
RESPONSIBLE CONSUMPTION AND PRODUCTION:

Forest operators can promote responsible consumption and production by adopting sustainable logging practices, adhering to certification standards such as Forest Stewardship Council (FSC), and implementing measures to minimise waste and optimise resource utilisation. This includes exploring opportunities for timber recycling and utilising by-products for value-added products.

SDG 13:
CLIMATE ACTION:

The forest operation sector can play a crucial role in climate change mitigation by implementing sustainable forest management practices that enhance carbon sequestration, reduce deforestation, and promote forest restoration. By conserving and restoring forest ecosystems, the sector contributes to global climate action efforts.

SDG 14:
LIFE BELOW WATER:

Forest operators operating near coastal areas can take measures to protect marine ecosystems by implementing sustainable logging practices that prevent sediment runoff into water bodies, avoiding logging activities that harm coastal habitats, and supporting initiatives to preserve marine biodiversity and fisheries.

SDG 15:
LIFE ON LAND:

Responsible forest management practices, such as sustainable logging, reforestation, and habitat conservation, contribute to the preservation of terrestrial biodiversity, ecosystem services, and the overall health of forest ecosystems. Forest operators can prioritise the protection of wildlife habitats and the conservation of flora and fauna within their operations.

SDG 16:
PEACE, JUSTICE, AND
STRONG INSTITUTIONS:

By adhering to ethical business practices, supporting transparency in forest operations, and engaging in responsible stakeholder engagement, forest operators contribute to the establishment of strong institutions, good governance, and social justice within the sector. This promotes sustainable forest management and supports the well-being of forest-dependent communities.

SDG 17:
PARTNERSHIPS FOR THE GOALS:

Collaboration between forest operators, government agencies, local communities, and other stakeholders is essential for achieving sustainable forest management. Through partnerships and initiatives, the sector can foster knowledge-sharing, promote sustainable practices, and advance the SDGs, ensuring the long-term conservation and sustainable use of forest resources.

By aligning their operations with the SDGs, the forest operation sector in Malaysia can contribute to the country's progress towards sustainable forest management, ensuring the preservation of valuable forest ecosystems, the well-being of forest-dependent communities, and a resilient and sustainable future for generations to come.

1.4 THE NEED FOR GREEN PRACTICES

1.4.1
WHAT ARE GREEN PRACTICES (GP)?

Green Practices are any target or initiative set out by industries that is in line with target outlined in Green Technology Master Plan (GTMP).

Examples of green practices in forest operations are:

- Emission reduction initiatives such as incorporation of EV or biofuel into forest operation machineries.

- Installation of technologies such as solar panel as source of renewable energy.

- Efficient tree cutting/felling to minimise waste generation.

- Implementation of water source protection initiatives such as silt trap/sediment trap

1.4.2
GREEN PRACTICES IN FOREST OPERATIONS

In the context of the forest operation sector in Malaysia, the adoption of green practices plays a vital role in promoting sustainable forest management and aligning with global environmental goals. The forest operation industry has a significant impact on the environment, and by embracing green practices, it can mitigate deforestation, conserve biodiversity, and contribute to the long-term health and resilience of forest ecosystems.

One example of a green practice in the forest operation sector is the implementation of sustainable harvesting methods. This involves utilising techniques that prioritise responsible tree felling, such as selective logging or reduced-impact logging. Forest operators can adhere to guidelines that ensure the preservation of forest structure, minimise damage to surrounding trees and vegetation, and promote natural regeneration. By adopting sustainable harvesting practices, the industry can maintain forest integrity, preserve habitat for wildlife, and support the sustainable utilisation of forest resources.

Promoting reforestation and afforestation initiatives is another essential green practice in the forest operation sector. Forest operators can actively engage in tree planting activities to restore degraded forest areas or establish new forests. By replanting native tree species and adopting sound silvicultural practices, the industry can enhance ecosystem resilience, sequester carbon dioxide, and contribute to climate change mitigation.

The conservation of forest biodiversity is a crucial aspect of green practices in the forest operation sector. Forest operators can prioritise the protection of rare and endangered species, implement measures to prevent habitat fragmentation, and establish protected areas within forest concessions. By integrating conservation considerations into forest management plans and implementing wildlife protection measures, the industry can contribute to the preservation of biodiversity and the ecological balance of forest ecosystems.

Sustainable forest certification is an important tool for promoting green practices in the forest operation sector. Forest operators can seek certification from reputable organisations such as the Forest Stewardship Council (FSC) or the Malaysian Timber Certification Council (MTCC). Certification ensures compliance with rigorous environmental, social, and economic standards, promoting responsible forest management and providing assurance to consumers that timber products originate from sustainably managed forests.

Engaging with local communities and indigenous peoples is a critical component of green practices in the forest operation sector. Forest operators can establish partnerships, consult local communities, and respect indigenous rights and traditional knowledge. By incorporating the perspectives and contributions of local stakeholders, the industry can foster social inclusion, address social and economic concerns, and promote sustainable forest governance.

By integrating these green practices into the forest operation sector, Malaysia can enhance sustainable forest management, conserve biodiversity, and contribute to the achievement of global sustainability goals. The adoption of green practices also strengthens the industry's reputation, improves market access for sustainably sourced timber products, and promotes responsible investment in the forestry sector.

Moreover, aligning with government policies, guidelines, and regulations related to forest conservation, sustainable forest management, and climate change mitigation demonstrates the forest operation sector's commitment to environmental stewardship and compliance with national sustainability objectives. By actively embracing green practices and supporting initiatives

such as the National Forestry Policy and the Green Technology Master Plan (GTMP), the industry can contribute significantly to the country's sustainability agenda.

In conclusion, the integration of green practices in the forest operation sector in Malaysia is crucial for promoting sustainable forest management, conserving biodiversity, and aligning with global sustainability goals. By adopting sustainable harvesting methods, promoting reforestation and afforestation, conserving forest biodiversity, seeking sustainable forest certification, and engaging with local communities, the industry can play a pivotal role in ensuring the long-term health and resilience of forest ecosystems.

Forest management with low greenhouse gas emissions aims to achieve sustainable, economically efficient, environmentally responsible and socially-oriented forest management and exploitation. Improved forest management practices enable forests to transition to sustainable forests that are more resilient to impacts of climate change.
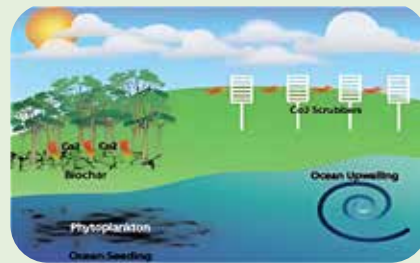
Forests provide regulatory services to reduce the impact of climate change. However, forest ecosystems are vulnerable to climate change. Therefore, the adaptation strategy should integrate a biophysical approach involving biodiversity conservation, forest management and reforestation, and a social process.

The forestry sectors can significantly contribute towards meeting green practices objectives linked to climate change policies, mainly through reducing greenhouse gas emissions and expanding renewable energy objectives.
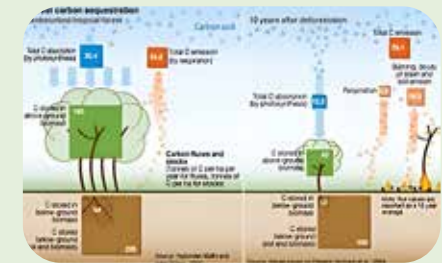
The need for best forest operations practices to mitigate climate change and contribute to a green practice was linked to managing the forest. Sustainable forest management (SFM) becomes even more critical now that forests are recognised for their crucial role as carbon sinks.

FOREST GOVERNANCE AND GREEN PRACTICES

1

Sustainable forestry, or sustainable forest management, is the practice of managing forests to meet current needs and desires of society for forest resources, i.e., products, services, and values, without compromising the availability of these for future generations (Boyle et al.,2016).

2

Forest governance is defined as the way in which public and private actors, including formal and informal institutions, smallholder and indigenous organisations, small, medium-sized and large enterprises, civil society organisations and other stakeholders negotiate, make and enforce binding decisions about the management, use and conservation of forest resources (FAO,2005).

3
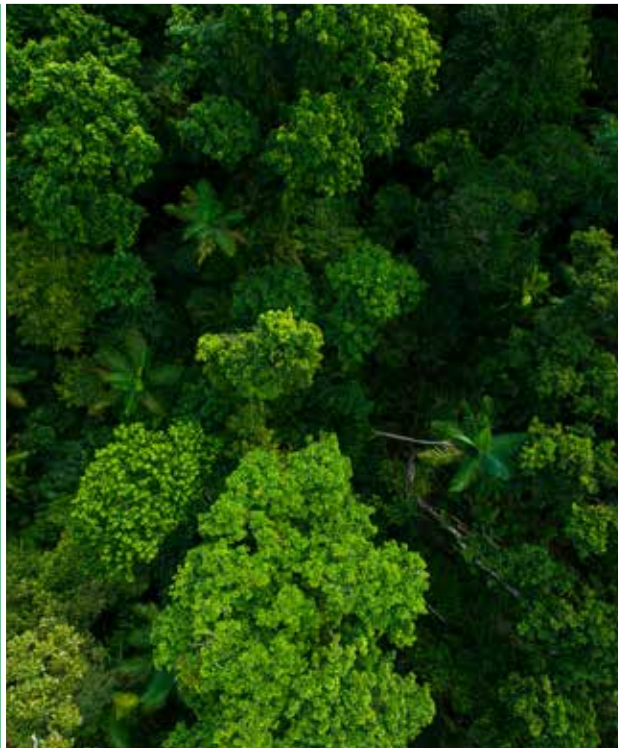
The New Deal describes the greening of the economy as the "process of reconfiguring businesses and infrastructure to deliver better returns on natural, human and economic capital investments, while at the same time reducing greenhouse gas emissions, extracting and using less natural resources, creating less waste and reducing social disparities."

4

The concept of forest governance has evolved to engage multiple (public and private) actors at various scales, from local to global. The key principles guiding good governance of "green forests" include equity and justice, empowerment, accountability, transparency, subsidiarity and sustainability.

1.4.3 EXISTING NATIONAL POLICIES & GUIDELINES

The forest operation sector in Malaysia operates within a framework of national policies and guidelines that promote sustainable forest management and ensure environmental protection. These policies and guidelines provide a regulatory foundation for responsible forest operation practices. Here are some key policies and guidelines relevant to the sector:

NATIONAL FORESTRY POLICY: This policy sets the strategic direction for the management and conservation of forest resources in Malaysia. It aims to achieve sustainable forest management, protect biodiversity, and promote the socio-economic well-being of local communities. The policy provides guidelines for forest operation activities, including sustainable harvesting practices, reforestation, and the protection of forest ecosystems.

FOREST CONSERVATION ACT 1980: This act is essential for the protection and conservation of forest reserves in Malaysia. It establishes regulations and standards for managing forest resources and prohibits activities that may cause damage or degradation to forests. The act ensures compliance with environmental requirements and supports the sustainable management of forest operations.

GUIDELINES FOR SUSTAINABLE FOREST MANAGEMENT: Malaysia has developed specific guidelines for sustainable forest management practices. These guidelines provide recommendations for the implementation of sustainable harvesting techniques, the protection of biodiversity, the conservation of water resources, and the promotion of ecosystem resilience. They guide forest operators in adopting sustainable practices that balance economic and environmental considerations.

FOREST CERTIFICATION SCHEMES: Forest certification schemes, such as the Malaysian Timber Certification Scheme (MTCS) and the Forest Stewardship Council (FSC) certification, play a crucial role in promoting sustainable forest operation practices. These certification schemes provide assurance to consumers that timber products originate from responsibly managed forests. By obtaining certification, forest operators demonstrate their commitment to sustainable forest management.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA): The EIA process is an essential component of responsible forest operation. It assesses the potential environmental impacts of forest operation activities and ensures that appropriate mitigation measures are implemented. Forest operators are required to conduct EIAs for significant forest operation projects, enabling informed decision-making and minimising adverse environmental impacts.

BEST MANAGEMENT PRACTICES: The adoption of best management practices is encouraged in the forest operation sector. These practices encompass various aspects, including erosion control, water quality protection, wildlife habitat conservation, and the prevention of invasive species. Forest operators can implement best management practices to minimise their environmental footprint and promote sustainable forest operation.

Through adherence to these national policies, guidelines, and standards, the forest operation sector in Malaysia can achieve sustainable forest management, conserve biodiversity, protect ecosystem services, and contribute to the country's sustainability goals. Compliance with these policies and guidelines is crucial for ensuring the long-term viability of forest resources and maintaining the ecological integrity of forest ecosystems.

Forest management and green practices shall comply with all applicable laws of Malaysia and respect international treaties and agreements to which Malaysia is a signatory.

The Cabinet Council Meeting has approved the National Forest Policy on 11 November 2020 and the 78th National Land Council Meeting on 29 January 2021.

TABLE 1:

EXISTING LEGISLATION AND REGULATIONS PERTAINING TO FOREST OPERATIONS

National Forestry Act 1984 (revised 1993) (Act 313)	Aboriginal Peoples Act 1954 (Act 134)	Environmental Quality Act 1974 (Act 127)
National Land Code 1965 (Act 56)	Land Conservation Act 1960 (Act 385)	Industrial Relations Act 1967 (Act 177)
Wildlife Conservation Act 2010 (Act 716)	International Trade in Endangered Species Act 2008 (Act 686)	Occupational Safety and Health Act 1994 (Act 514)
Waters Act 1920 (Act 418)	Machinery Act 1967 (Act 139)	Employment Act 1955 (Act 265)

TABLE 2:

ISO STANDARDS THAT ARE APPLICABLE IN GREEN INDUSTRIAL PRACTICES.

Recognises organisations that have enhanced environmental performance and met compliance requirements by implementing and maintaining equipment, systems, processes, and personnel training to reduce environmental impact.

Recognises organisations that have implemented rigorous workplace health and safety systems that improve safety, reduce workplace risks and create better and safe working conditions.

Recognises organisations that have developed and integrated an efficient energy management system that has been integrated into their overall efforts to improve operational efficiencies and improve energy use.
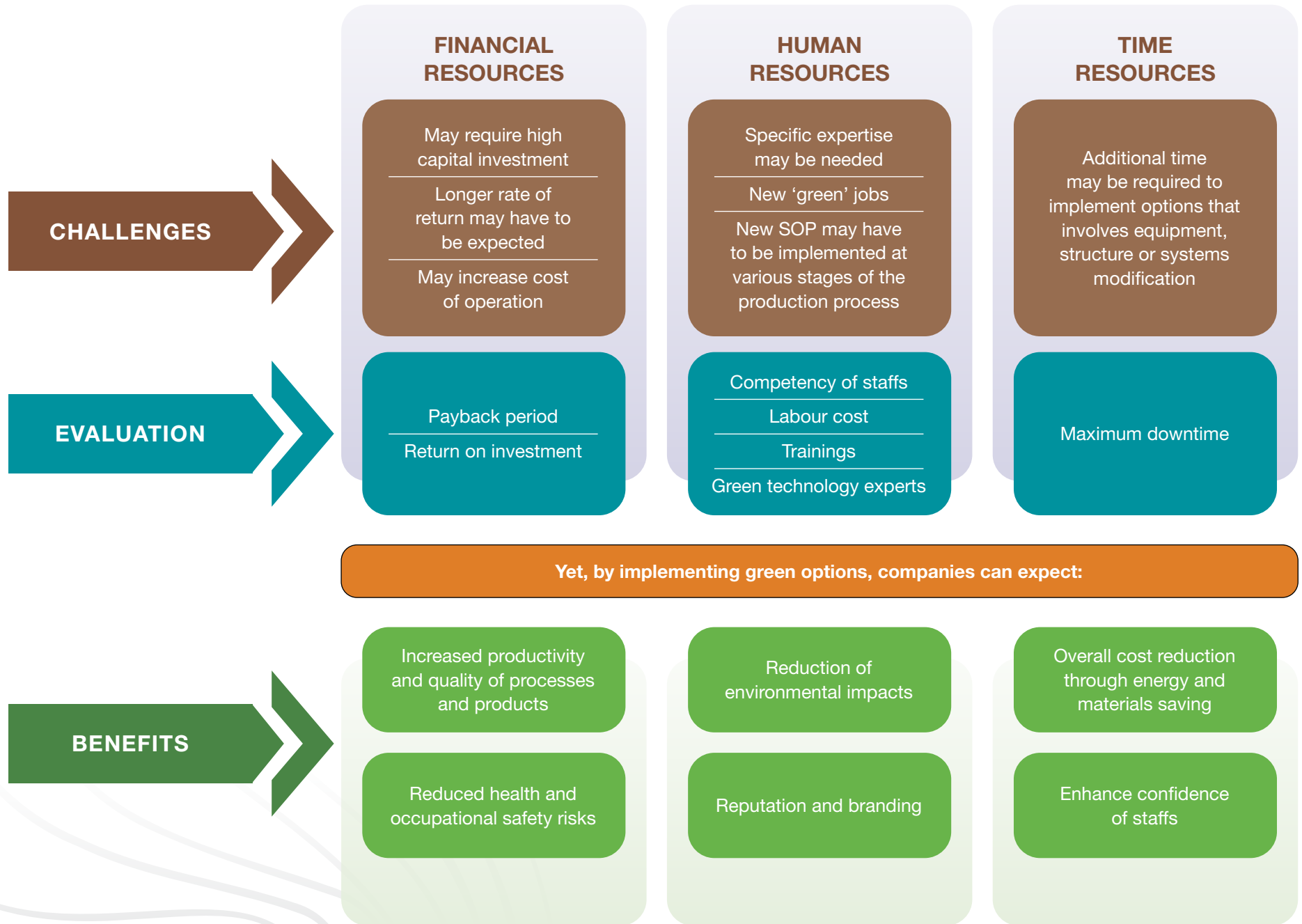
1.4.4 BENEFITS OF GREEN PRACTICES

Green practices in forest operations in Malaysia offer numerous benefits that contribute to improved efficiency, reduced resource consumption, and enhanced sustainability. By adopting these practices, the forest operation industry can achieve the following advantages:

1. **SUSTAINABLE HARVESTING TECHNIQUES:** Green practices promote the use of sustainable harvesting techniques that minimise the environmental impact on forest ecosystems. This includes selective logging methods that target specific tree species and sizes, leaving behind healthy trees for regeneration and maintaining biodiversity. By adopting such techniques, forest operators can ensure the long-term viability of forest resources and protect sensitive habitats.

2. **REFORESTATION AND HABITAT RESTORATION:** Green practices in forest operations emphasise the importance of reforestation and habitat restoration. By replanting harvested areas with native tree species and rehabilitating degraded forest lands, operators can contribute to ecosystem recovery and enhance the overall health and resilience of forest ecosystems. This supports the conservation of biodiversity and the provision of vital ecosystem services.

3. **CONSERVATION OF WATER RESOURCES:** Forest operations can implement green practices to conserve water resources. This includes the establishment of buffer zones along rivers and streams to protect water quality and aquatic habitats. Additionally, forest operators can implement measures to reduce erosion and sedimentation, such as proper road construction techniques and the use of erosion control structures. These practices help maintain water availability and quality for both ecological and human needs.

4. **ENERGY EFFICIENCY AND RENEWABLE ENERGY:** Green practices in forest operations involve promoting energy efficiency and utilising renewable energy sources. Operators can adopt energy-efficient technologies and equipment for forest harvesting, processing, and transportation activities. Furthermore, the integration of renewable energy solutions, such as solar or biomass energy, can reduce reliance on fossil fuels and contribute to the transition to a low-carbon economy.

5. **COLLABORATION AND STAKEHOLDER ENGAGEMENT:** Green practices in forest operations emphasise collaboration and stakeholder engagement. Forest operators can work closely with local communities, indigenous peoples, and other stakeholders to ensure their involvement and benefit sharing in sustainable forest management practices. Engaging stakeholders through dialogue and partnerships fosters social inclusivity, improves resource management, and supports the development of mutually beneficial initiatives.

6. **COMPLIANCE WITH FOREST CERTIFICATION STANDARDS:** Forest certification schemes, such as the Malaysian Timber Certification Scheme (MTCS) and the Forest Stewardship Council (FSC) certification, provide frameworks for green practices in forest operations. By obtaining certification, forest operators demonstrate their commitment to sustainable forest management, responsible harvesting, and the conservation of forest ecosystems. Certification enhances market access and supports the demand for sustainably sourced timber products.

Implementing green practices in forest operations not only ensures the responsible management of forest resources but also contributes to ecosystem conservation, climate change mitigation, and the well-being of local communities. By prioritising sustainability, forest operators can secure the long-term viability of Malaysia's forests and contribute to a greener and more sustainable future.

	FINANCIAL RESOURCES	HUMAN RESOURCES	TIME RESOURCES
CHALLENGES	May require high capital investment Longer rate of return may have to be expected May increase cost of operation	Specific expertise may be needed New 'green' jobs New SOP may have to be implemented at various stages of the production process	Additional time may be required to implement options that involves equipment, structure or systems modification
EVALUATION	Payback period Return on investment	Competency of staffs Labour cost Trainings Green technology experts	Maximum downtime

Yet, by implementing green options, companies can expect:

BENEFITS — Increased productivity and quality of processes and products	Reduction of environmental impacts	Overall cost reduction through energy and materials saving
Reduced health and occupational safety risks	Reputation and branding	Enhance confidence of staffs

1.5 OUTCOME FROM GREEN PRACTICES

In order to determined level of GP implemented in an organisation, the initiatives related to GP shall be assessed according to the method described in Chapter 2 in the guideline and results from the assessment shall be translated into the following Star-Rating System:

(60% - 70%)

Comply to all
regulatory requirements

Demonstrate leadership
in developing systematic
environmental reporting practical

(71% - 80%)

Exhibit characteristics
of being resource efficient

Demonstrating positive
impacts from green practices

Incorporate and implement continuous
quality improvement initiatives
throughout business operations

(81% - 100%)

Demonstrate integration of
governance framework related to
sustainability and circular economy

Demonstrate capacity in contributing
towards achieving national
decarbonisation targets

Demonstrates leadership in
developing, expanding and applying
new tech related to green practices

ASSESSMENT

2

PART II: ASSESSMENT

2.1 ABOUT THE ASSESSMENT OF GREEN PRACTICES

Green practices in forest operations in Malaysia aim to foster innovation, minimise resource usage, eliminate or minimise toxic substances, reduce waste generation, and achieve net-zero greenhouse gas emissions throughout the entire forest management process. By adopting sustainable practices, the forest operation industry can contribute to a greener and more sustainable future. Here are some key goals and examples of green practices in forest operations:

1. **RESOURCE CONSERVATION:** The forest operation sector aims to conserve valuable resources such as timber, water, and energy. This can be achieved through practices such as selective harvesting techniques that target specific tree species and sizes, promoting responsible and sustainable timber extraction, and implementing efficient water and energy management systems in forest operations.

2. **WASTE REDUCTION AND RECYCLING:** Green practices in forest operations emphasise waste reduction and recycling. Forest operators can implement strategies to minimise waste generation during logging activities, such as utilising timber residues for bioenergy production or other value-added products, and practicing responsible waste management and recycling.

3. **ENERGY EFFICIENCY:** Forest operations can prioritise energy-efficient practices to minimise energy consumption and reduce greenhouse gas emissions. This includes utilising energy-efficient machinery and equipment, optimising transportation routes to minimise fuel consumption, and implementing technologies that promote energy efficiency in processing and manufacturing activities related to forest products.

4. **SUSTAINABLE FOREST MANAGEMENT:** Adopting sustainable forest management practices is crucial for the preservation and regeneration of forest ecosystems. This includes implementing reforestation programmes to ensure the long-term availability of timber resources, protecting biodiversity and wildlife habitats, and integrating climate change mitigation and adaptation strategies into forest management plans.

5. **CERTIFICATION AND STANDARDS:** Forest certification schemes such as the Malaysian Timber Certification Scheme (MTCS) and Forest Stewardship Council (FSC) certification provide frameworks for green practices in forest operations. By obtaining certification, forest operators demonstrate their commitment to responsible forest management, adherence to environmental and social criteria, and the sustainable sourcing of timber products.

6. **STAKEHOLDER ENGAGEMENT AND COLLABORATION:** Green practices in forest operations require collaboration among various stakeholders, including government agencies, local communities, indigenous peoples, and environmental organisations. Engaging stakeholders in decision-making processes, promoting knowledge sharing, and fostering partnerships can lead to more inclusive and sustainable forest management practices.

By adopting these green practices, the forest operation sector in Malaysia can contribute to resource conservation, waste reduction, energy efficiency, and the overall sustainability of forest ecosystems. These practices not only benefit the environment but also ensure the long-term viability of the forest industry, support the livelihoods of local communities, and promote the preservation of Malaysia's rich biodiversity and natural heritage.

2.2 GUIDELINE IMPLEMENTATION

To successfully integrate green practices into existing operations and processes, manufacturers in forest operations are recommended to follow the following three steps:

1
Assessment

Set Targets for Improvement
2

Implement Green Practice
3

STAGE 1:
ASSESSMENT

Understand the Assessment Requirements: Familiarise yourself with the assessment criteria outlined in the Green Practices Data Collection Form (Appendix 2) for the six indicators described in Section 2.3. These indicators are specifically tailored to the forest operation sector and include criteria such as biodiversity conservation, sustainable harvesting practices, ecosystem restoration, community engagement, worker safety, and compliance with environmental regulations. Refer to the Indicator Instrument Factsheet (Appendix 3) for detailed information on each indicator, including goals, targets, terminologies, data sources, and collection methods.

Prepare Relevant Documents: Gather the necessary documents and records as evidence of green practices implementation in forest operations. These may include forest management plans, biodiversity impact assessments, logging permits and certifications, records of community consultations and collaborations, worker safety reports, and evidence of compliance with environmental regulations. These documents will serve as proof of compliance with the green practices criteria.

Conduct Assessment: Evaluate green practices according to the criteria established for each indicator. Present the relevant documents as evidence of implementation during the assessment process. Scores will be assigned based on the criteria, and the overall mark for each indicator will be calculated by multiplying the sum of sub-indicator scores with their assigned weightage. The weightage reflects the importance of each indicator to the forest operation sector. The total score will be translated into a Star Rating system, providing an overall assessment of the forest operation's green practices.

STAGE 2:
SET TARGETS FOR IMPROVEMENT

Define Clear Objectives: Based on the assessment conducted in Stage 1, establish clear objectives that describe the desired outcomes of implementing green practices in forest operations. These objectives may include enhancing biodiversity conservation, implementing sustainable harvesting techniques, promoting community-based forest management, ensuring worker safety, and achieving compliance with environmental regulations. Identify areas of improvement required to achieve these objectives based on the assessment results.

Set Realistic and Attainable Targets: Align targets for each indicator with the goals and targets outlined in the Indicator Instrument Factsheet and the scoring criteria in the Green Practices Data Collection Form. Assign deadlines or timelines to each target to ensure progress can be measured effectively. For example, set a target to increase the area of protected forest by 10% within the next five years or to reduce workplace accidents by implementing comprehensive safety training programmes.

STAGE 3:
IMPLEMENT GREEN PRACTICES

Formulate an Action Plan: Develop a detailed action plan that outlines the necessary steps and timelines for implementing green practices in forest operations. Tailor the plan to address the specific objectives and targets identified in Stage 2. Examples of actions may include implementing sustainable forest management practices, conducting regular biodiversity assessments, engaging local communities in forest conservation programmes, providing comprehensive safety training for workers, and establishing robust monitoring and reporting systems. Allocate resources, such as budgets and personnel, to support the implementation efforts

Engage Employees: Foster employee engagement at all levels to drive successful implementation of green practices in forest operations. Raise awareness about the importance of sustainability and provide training and education on green practices. Encourage employees to contribute ideas and suggestions for improving sustainability efforts. Recognise and reward environmentally conscious behaviors and achievements to cultivate a culture of sustainability within the forest operation sector.

Collaborate with Suppliers and Partners: Engage with stakeholders, such as local communities, indigenous groups, government agencies, and environmental organisations, to promote sustainable practices in forest operations. Seek their input and involvement in decision-making processes, develop partnerships for conservation initiatives, and collaborate on projects that support community development and biodiversity conservation.

Measure, Evaluate, and Improve: Establish a system for measuring and evaluating the effectiveness of green practices in forest operations. Monitor key performance indicators (KPIs) to track progress towards sustainability goals. Regularly review and analyse data to identify areas for improvement. Use this information to refine strategies and adjust implementation plans as needed, ensuring continuous improvement in the industry's green practices.

By following these steps, forest operators can effectively integrate green practices into their operations, promoting sustainability, biodiversity conservation, community engagement, and compliance with environmental regulations. This contributes to the long-term viability of the forest operation sector in Malaysia while ensuring the preservation and sustainable management of the country's valuable forest resources.
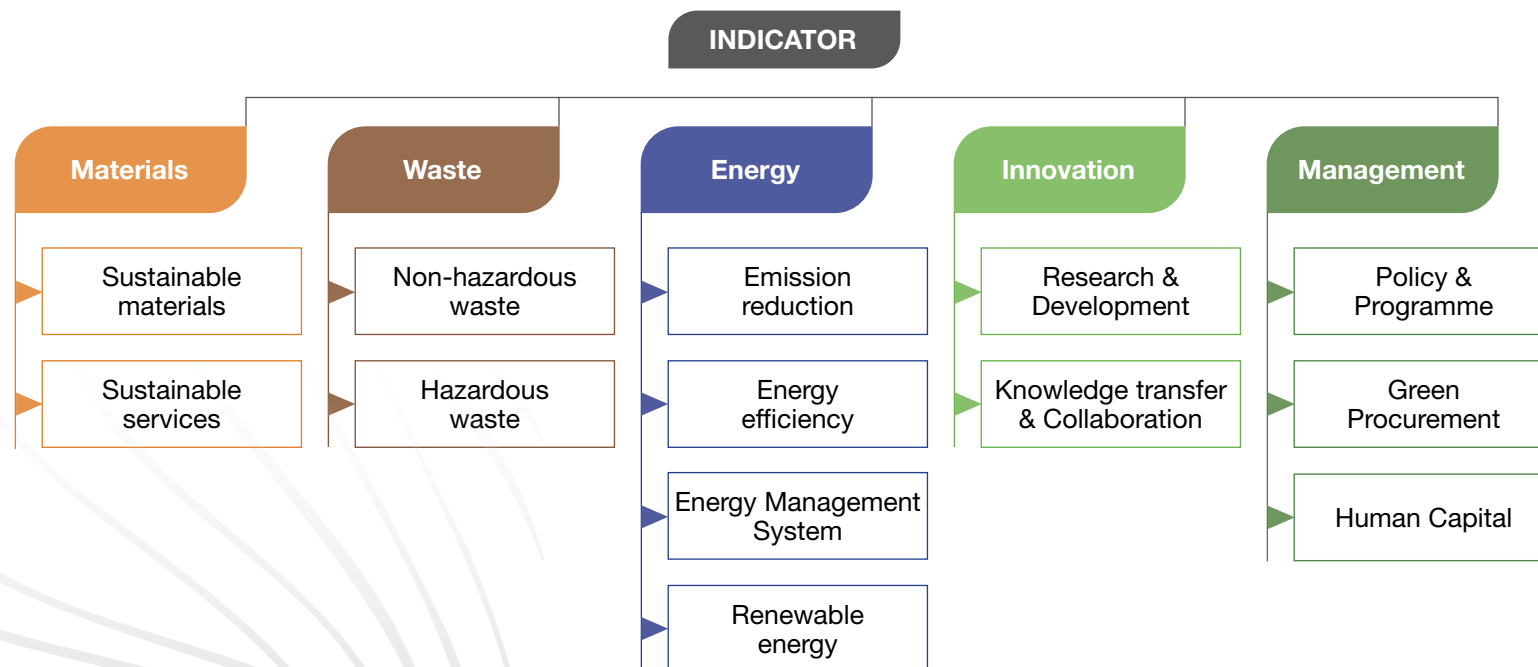
2.3   INDICATORS

Indicators are crucial for evaluating and comparing the performance of industries in adopting green practices. These indicators provide a standardised framework for assessing the environmental sustainability efforts across various sectors. In order to ensure a comprehensive and meaningful evaluation, a set of six indicators and sixteen sub-indicators have been identified based on three key requirements: applicability, measurability, and representativeness.

The selected indicators and sub-indicators were carefully chosen to capture the key aspects of green practices and their impact on sustainability. Applicability ensures that the indicators are relevant and applicable to a wide range of industries, allowing for consistent evaluation across different sectors. Measurability ensures that the indicators can be quantified or assessed using objective criteria, enabling meaningful comparisons between industries. Representativeness ensures that the indicators encompass a comprehensive set of factors that reflect the overall performance of green practices.

By utilising these indicators, stakeholders can effectively gauge the extent to which industries are implementing green practices and contributing to sustainable development. The indicators provide a structured approach to measure and monitor progress in key areas such as resource conservation, emissions reduction, waste management, and sustainable operations.

These indicators serve as a valuable tool for decision-making, enabling industries to identify areas for improvement, set targets, and track their performance over time. Furthermore, they facilitate benchmarking exercises, allowing industries to compare their performance against sector peers and best practices.

The use of indicators promotes transparency and accountability, enabling stakeholders to assess the environmental performance of industries and make informed choices. It also provides an opportunity for recognition and incentives, as industries that demonstrate strong performance in adopting green practices can be acknowledged and rewarded for their efforts.

INDICATOR

Materials	Waste	Energy	Innovation	Management
Sustainable materials	Non-hazardous waste	Emission reduction	Research & Development	Policy & Programme
Sustainable services	Hazardous waste	Energy efficiency	Knowledge transfer & Collaboration	Green Procurement
		Energy Management System		Human Capital
		Renewable energy		

2.3.1 MATERIALS

The Material Indicator for Green Practices focuses on the responsible and sustainable management of materials utilised across industries. Industries use various types of materials in their processes, with some relying exclusively on virgin materials while others incorporate recycled materials. The efficient consumption of materials is essential for the long-term survival and success of industries, as it directly impacts resource availability and overall material efficiency.

The Material Indicator within the Green Practices framework encompasses two sub-indicators: Sustainable Materials and Sustainable Services.

Sustainable Materials: This sub-indicator assesses the demonstration of purchasing and utilisation practices related to sustainable materials within industries. It requires industries to showcase a clear direction and vision towards sustainable material utilisation, along with the implementation of self-regulation measures that align with sustainability goals. Additionally, recognition or certification from reputable third-party entities or certification bodies further validates the commitment to sustainable material practices.

Sustainable Services: This sub-indicator evaluates the purchase and utilisation of sustainable services within industry operations. It encourages industries to demonstrate a specific direction and vision regarding the use of sustainable services. The implementation of self-regulation measures that align with sustainability goals should be evident, and recognition or certification from reputable third-party entities or certification bodies can further validate the adherence to sustainable service practices.

By addressing the Material Indicator and its sub-indicators, industries can enhance their material management practices, promoting the use of sustainable materials and services. This not only supports environmental conservation and resource preservation but also aligns with industry-wide sustainability goals. It demonstrates a commitment to responsible material utilisation and contributes to the long-term viability and success of industries across diverse sectors.

SUB-INDICATOR	REQUIREMENT	OBJECTIVE EVIDENCE FOR ASSESSMENT	EXAMPLE GREEN PRACTICES
SUSTAINABLE MATERIALS	Demonstration on purchase or use of sustainable materials	• Company sustainability report • Organisation sustainability policies • Sustainability monitoring activity • Certification or recognition of sustainable material	• Coordinate and perform directional felling to optimise natural resources and reduce waste in forest operations. • Use efficient chainsaws to maximize log materials in forest operations.
SUSTAINABLE SERVICES	Demonstration on purchase or use of sustainable services	• Company sustainability report • Organisation sustainability policies • Sustainability monitoring activity • Certification or recognition of sustainable material	• Choose service providers with a clear sustainability practice

2.3.2 WASTE

Waste refers to any material that is discarded or released by the generator or holder, posing various environmental risks based on its chemical composition and physical state. In green practices, the focus is on prevention or reduction of waste at its source, employing strategies and approaches distinct from end-of-pipe treatment.

The definition of industrial waste, as stated in Section 2 of the Environmental Quality Act 1974 (Act 127) and Regulations, encompasses matter prescribed as scheduled wastes or any solid, semi-solid, liquid, gas, or vapor emitted, discharged, or deposited in the environment in quantities, compositions, or manners that cause pollution.

Implementing an effective waste management plan necessitates strategic measures that encompass all stages of waste management. Manufacturers should conduct a thorough analysis of the current collection, handling, treatment, and disposal processes to identify existing or potential issues. Based on this assessment, specific goals and action plans can be developed and implemented, with regular monitoring and review to ensure progress.

The waste management plan should also prioritise the enhancement of stakeholders' knowledge through the effective dissemination of technical information and research findings concerning the environmental impacts of the waste generated. By promoting awareness and understanding, stakeholders can actively participate in waste reduction and proper waste management practices.

To guide waste management efforts, the following goals and targets have been established:

- By 2030, achieve 100% recycling of sludge.
- By 2030, recycle 33% of treated effluent.
- By 2025, achieve a 40% recycling rate of solid waste from total non-hazardous waste generated.
- By 2030, achieve a 50% recycling rate of hazardous waste from the total hazardous waste generated.
- By 2025, completely eliminate waste disposal in landfills.
- By 2030, establish 180 biogas capture facilities.

These goals provide clear targets for waste reduction, recycling, and resource recovery, contributing to the overall objective of sustainable waste management. By striving to meet these targets, manufacturers can significantly reduce their environmental impact, conserve resources, and promote a circular economy approach in the handling of waste.

The scope for Waste in Forest Operation sector includes two (2) sub-indicators; Non-hazardous Solid Waste and Hazardous Waste.

SUB-INDICATOR	REQUIREMENT	OBJECTIVE EVIDENCE FOR ASSESSMENT	EXAMPLE GREEN PRACTICES
NON-HAZARDOUS WASTE	• Targeted percentage of non-hazardous waste recycled achieved by the organisation • Number of biogas capture facility within the organisation	• Records on monitoring non-hazardous waste generated and recycled in the organisation • Number of biogas facility	• Compost damaged and decayed trees to optimise natural resources and minimise environmental impacts. • Reuse wood waste for secondary products or wood chips using an industrial Chipper machine.
HAZARDOUS WASTE	Targeted percentage of hazardous waste recycled achieved by the organisation	Records on monitoring hazardous waste generated and recycled in the organisation	• Manage waste products and chemicals • Minimise use of chemical-based pesticides and biocides; opt for organic alternatives. • Recycle hazardous waste like engine oils, hydraulic oils, solvents

2.3.3 ENERGY

Energy consumption plays a pivotal role in achieving decarbonisation and driving green practices in industries. Globally, electricity and power generation continue to be major contributors to greenhouse gas (GHG) emissions. Therefore, focusing on energy efficiency and transitioning to low-carbon energy sources is crucial for sustainable development.

The adoption of electrification is gaining momentum in numerous decarbonisation efforts. By shifting from traditional fossil fuel-powered systems to electric alternatives, industries can significantly reduce their carbon footprint. Electric vehicles (EVs), for instance, offer a greener transportation solution compared to internal combustion engine (ICE) vehicles. Furthermore, integrating renewable energy sources such as solar, wind, hydro, and geothermal power into electricity generation is essential for reducing reliance on fossil fuels and achieving a cleaner energy mix.

In Malaysia, the planned National Energy Policy includes ambitious targets to increase the generation of renewable energy from sources like solar, biomass, and biogas. This renewable energy capacity expansion aligns with the nation's commitment to reducing carbon intensity and achieving sustainable energy practices.

To drive decarbonisation and achieve long-term environmental sustainability, industries must prioritise energy-saving measures and the adoption of energy-efficient technologies. This includes optimising manufacturing processes, implementing smart energy management systems, and investing in energy-efficient equipment. Additionally, exploring innovative solutions like energy recovery systems, waste heat utilisation,, and energy conservation initiatives can contribute to significant energy savings and emissions reduction.

By setting clear goals and targets, such as those outlined in the Nationally Determined Contribution (NDC), industries can actively contribute to the national and global efforts of reducing carbon intensity. Meeting the NDC target of carbon intensity reduction by a certain percentage compared to a baseline year demonstrates the commitment to sustainable practices and aligns with the broader goals of the Paris Agreement.

Energy plays a critical role in decarbonization and achieving green practices in industries. By embracing electrification, adopting renewable energy sources, and implementing energy-saving measures, industries can drive the transition to a low-carbon economy, reduce GHG emissions, and contribute to a sustainable and resilient future.
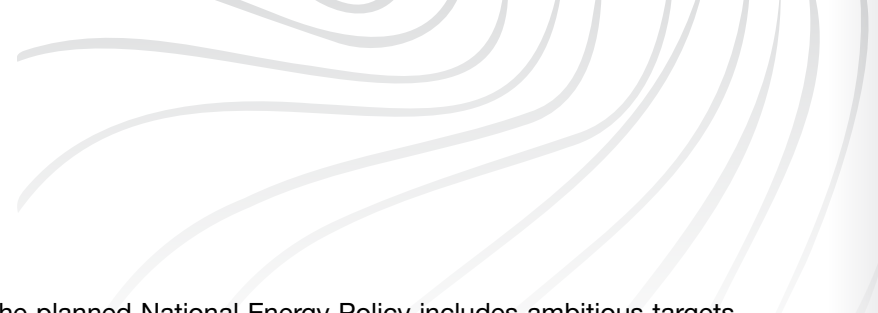
The scope for Energy in Forest Operation sector includes four (4) sub-indicators; Energy Efficiency, Renewable Energy, Energy Management System and Emission Reduction.

SUB-INDICATOR	REQUIREMENT	OBJECTIVE EVIDENCE FOR ASSESSMENT	EXAMPLE GREEN PRACTICES
ENERGY EFFICIENCY	Targeted percentage of electricity and fuel consumption reduction achieved by the organisation	• Meter energy usage readings • Bills of quantities for fuels • COA for fuels	• Use green electricity generator (Genset) for forest operation facilities. • Monitor energy consumption for billing purposes. • Utilise green technology and EV vehicles in forest operations.
RENEWABLE ENERGY	Targeted percentage of renewable energy used by the organisation	• Meter energy usage readings • Bills of quantities for fuels • COA for fuels	• Utilisation of renewable energy from process residues • Application of waste-to-energy technologies. • Facilitate circular economy through resource sharing and fuel optimisation (especially when transporting materials to the project site). • Installation of solar panels for energy supply to reduce electricity consumption.
ENERGY MANAGEMENT SYSTEM	Demonstration of an Energy Management System setup within the organisation	Records supporting the setup, operation, and performance achieved by the Energy Management System	• To establish policy or standard in the organisation which clearly indicates the green practice in the mission and vision statement. • Periodically report on energy usage as a monitoring tool. • Developing and implementing a systematic procedure for the energy management system
EMISSION REDUCTION	Targeted percentage of emissions reduction achieved by the organisation	GHG Inventory reports	• Reduce energy use with renewable energy sources like solar panels, LED bulbs, and biofuel. • Decrease energy consumption intensity in forest operations.

2.3.4 INNOVATION

Innovation plays a crucial role in driving green practices within the industry as manufacturers strive to adapt their business processes and activities to meet the demands of a competitive global market. By prioritising innovation, businesses can develop marketable, viable, and effective products that align with sustainability objectives.

One of the key indicators of innovation in green practices is research and development (R&D) efforts focused on green technology. Manufacturers invest in R&D to explore and develop innovative solutions that improve environmental performance and reduce the ecological footprint of their operations. This includes advancements in energy-efficient processes, waste reduction techniques, sustainable materials, and eco-friendly manufacturing methods.

Additionally, innovation in green practices encompasses the product development phase, which involves incorporating green product design principles. Manufacturers aim to create products that have minimal environmental impact throughout their lifecycle, from sourcing and production to use and disposal. This involves considering factors such as energy efficiency, recyclability, reduced resource consumption, and the use of environmentally friendly materials.

Setting goals and targets for innovation in green practices can drive organisational progress. Establishing robust research and development processes, output, and policies enables organisations to streamline their innovation efforts and focus on sustainable solutions. Increasing investment and incentives to support innovation in green practices further promotes the commercialisation of environmentally friendly products. This can involve securing intellectual property rights, receiving awards and recognition, and fostering a culture of innovation within the organisation.

Strategic partnerships, collaborations, joint ventures, and knowledge transfer programmes are also vital for fostering innovation in green practices. By collaborating with other organisations, sharing knowledge and expertise, and leveraging collective resources, manufacturers can accelerate the development and implementation of sustainable solutions. These partnerships can lead to the commercialisation of innovative green products, technologies, and practices.

In conclusion, innovation is a critical measure of green practices in the industry. By prioritising research and development efforts, incorporating green product design principles, and establishing strategic partnerships, manufacturers can drive the adoption of sustainable solutions, reduce their environmental impact, and contribute to a greener and more sustainable future.

The scope for Innovation in Forest Operation sector includes two (2) sub-indicators; Knowledge Transfer & Collaboration and Research and Development (R&D).

SUB-INDICATOR	REQUIREMENT	OBJECTIVE EVIDENCE FOR ASSESSMENT	EXAMPLE GREEN PRACTICES
KNOWLEDGE TRANSFER AND COLLABORATION	Demonstration of knowledge transfer and strategic collaboration occurring in the organisation	Records and documentations such as MOUs, MOAs, IPs, etc.	• Strategic partnership or collaborative project to commercialise the green product for commercialisation, create social value in targeted communities, and improve current green practice • Develop strategic of partnership/collaborated project MoU/MoA and proved of ROI in building operations and activities to optimise lifetime of building services system within building compound area
RESEARCH AND DEVELOPMENT (R&D)	Demonstration of R&D activities occurring in the organisation	Records and documentations such as organisation chart, procedures, blueprints, proposals, etc.	• Develop and implement policies related to the allocation of resources towards R&D within the organisation • Making strategic investments in R&D and innovations that enable green technologies to be embedded into existing infrastructure, systems, and processes

2.3.5 MANAGEMENT

Management plays a crucial role in driving and implementing green practices within the industry. The administration of an organisation,, company, or business is responsible for creating forward-thinking policies and strategies that support the development of a more sustainable form of business. By embracing environmentally responsible practices, businesses can minimise the negative impacts of their manufacturing processes on the environment and contribute to a greener future.

Going beyond compliance with legal requirements, being environmentally responsible means investing in human capital and adopting management practices that actively contribute to the industry's green initiatives. This involves fostering a culture of sustainability within the organisation, where all stakeholders, including employees and customers, are engaged in reducing environmental impacts. Effective management practices focus on integrating sustainable principles into decision-making processes, resource allocation, and operational strategies.

The global shift towards a green economy, driven by ESG frameworks and investment systems, is transforming the landscape of job creation, skills development, and job quality. Businesses that prioritise green practices and demonstrate commitment to environmental sustainability are better positioned to thrive in this evolving economic landscape. By proactively adopting green manufacturing principles, manufacturers can align their initiatives with the goal of achieving a greener future.

Manufacturers have the flexibility to choose and prioritise their initiatives within the realm of green manufacturing based on their level of readiness and business objectives. This includes focusing on green energy solutions, developing green products, and implementing green processes. By incorporating renewable energy sources, reducing carbon emissions, and optimising resource usage, manufacturers can enhance their environmental performance while improving operational efficiency.

The government has developed various initiatives to support and propel the adoption of green practices in the industry. Programmes such as the MyHijau SME & Entrepreneur Development Programme, Energy Audit Grant for the industrial sector, Energy Management Gold Standard (EMGS), Enhanced Time of Use tariff (EToU), and ISO14001 certification provide valuable resources and incentives for businesses to embrace sustainability. These initiatives encourage manufacturers to actively engage in green practices, implement energy-saving measures, adopt environmentally friendly technologies, and strive for continuous improvement in their environmental performance.

In conclusion, effective management practices are essential for driving green practices within the industry. By adopting forward-thinking policies, fostering a culture of sustainability, and embracing green initiatives, businesses can minimise their environmental footprint, meet the demands of a changing economic landscape, and contribute to a more sustainable future.

The scope for Management in Forest Operation sector includes three (3) sub-indicators; Green Procurement, Policy & Programme and Human Capital.

SUB-INDICATOR	REQUIREMENT	OBJECTIVE EVIDENCE FOR ASSESSMENT	EXAMPLE GREEN PRACTICES
GREEN PROCUREMENT	Demonstration of green procurement practices occurring in the organisation	Records and documentations such as policies and standards, agreements, purchase records, etc.	• Include environmental requirements in specifications with contractors, suppliers, and service providers. • Establish a mechanism to determine the level of greenhouse gas emissions generated by suppliers.
POLICY AND PROGRAMME	Demonstration of policies and programmes practices occurring in the organisation that support Green Practices	Records and documentations such as MOUs, MOAs, IPs, etc.	• Promotion of recycling and reuse practices to raise awareness of responsible and sustainable consumption. • Develop green policies or operating standards to integrate sustainability in business operations across several departments, foster innovation, and boosts engagement.
HUMAN CAPITAL	Demonstration of a human capital development programme in the organisation that support Green Practices	Records and documentations such as policies and standards, records of training, etc.	• Open opportunities to the current workforce to become competent persons for environmental management and green practices. • Carry out capacity building and training periodically to enhance the skill and competency of staff in construction work.

IMPLEMENTATION OF GREEN PRACTICES

3

3.1 INDICATOR ALIGNMENT

In this section, a framework is introduced to help industries in recognising the various certificates, recognitions and benefits that exists within Malaysia. Using this framework, the forest operation sector can refer to the specific guidelines and best practices that support the application of green practices in the industry. Forest Operation sector can also refer to the indicators that align with the various existing initiatives.

EXISTING INITIATIVES	AGENCY/ INSTITUTIONS REFERENCE	DESCRIPTION	CRITERIA FOR ASSESSMENT	GREEN PRACTICES INDICATOR	BENEFITS	REFERENCE (SCAN FOR LINK)
GREEN INVESTMENT TAX ALLOWANCE (GITA)	MIDA	Incentive or companies that undertake Green Technology projects involving capital investments.	Renewable Energy RE Energy Efficiency (EE); Green Building; Green Data Centre; Integrated Waste Management		Tax allowance	
GREEN INCOME TAX EXEMPTIONS (GITE)	MIDA	Incentive for companies that carry out services which support the implementation and operation of Green Technology projects.	Renewable Energy (RE); Energy Efficiency (EE); Green Building; Green Data Centre; Green Certification and Verification; Green Township; Electrical Vehicle		Tax exemptions	
MyHIJAU MARK	MGTC	A government initiative to promote the sourcing and purchasing of green products and services in Malaysia.	Existing Green Label Certification, or Performance Standard Compliance report from an independent certification body that meets the minimum standards recognised by MGTC		Eligibility for Government Green Procurement (GGP), Green Private Purchasing (GPP), and may be eligible for GITA or GITE	
ECO-LABELLING SCHEME	SIRIM	This labelling gives eco-friendly products a competitive advantage over similar products.	Compliance with product standards or specifications and the relevant eco-labelling criteria, as well as relevant provisions in the Environmental Quality Act		Boost acceptance of products in international "green markets" that favour green products with a price premium	

EXISTING INITIATIVES	AGENCY/ INSTITUTIONS REFERENCE	DESCRIPTION	CRITERIA FOR ASSESSMENT	GREEN PRACTICES INDICATOR	BENEFITS	REFERENCE (SCAN FOR LINK)
ANUGERAH INDUSTRI HIJAU	Dept. of Environment (DOE)	An initiative by the DOE to provide special recognition and encouragement to SMEs for the efforts of implementing green industry practices.	Green activities and initiatives on water usage, electricity, fuel, raw materials, packaging materials, waste production, product lost, raw materials lost and wastewater production		Improved reputation and branding	
NATIONAL ENERGY AWARDS	MGTC	A platform to provide recognition and rewards to Malaysia's industry leaders in the growing green technology related products, services and energy services sectors for adopting and implementing sustainable energy practices.	Energy Efficiency (EE), Renewable Energy (RE)		International recognition and eligible to represent Malaysia at the annual ASEAN Energy Awards, Southeast Asia's highest energy awards	
PRIME MINISTER'S HIBISCUS AWARDS	ENSEARCH, FMM & MICCI with recognition from KASA	Provide an opportunity for public recognition of businesses and industry's environmental commitment, management, and performance	Leadership; Priority and commitment; Managing environmental issue; Training and communication; Legal and other compliance; Environmental emergencies; Employee participation; Supply chain; Environmental social programme; Environmental accounting; Eco-design; Carbon footprint		National recognition with a Plague and Certificate of Participation, and eligibility to include award's logo for promotional activities	
NATIONAL GREEN TECHNOLOGY POLICY (NGTP)	KASA *previously developed under KeTTHA	This policy recognises green technology as a driver to accelerate the national economy and promote sustainable development	Energy sector; Building sector; Water and waste management sector; Transportation sector		Reduction in the rate of GHG emission	

EXISTING INITIATIVES	AGENCY/ INSTITUTIONS REFERENCE	DESCRIPTION	CRITERIA FOR ASSESSMENT	GREEN PRACTICES INDICATOR	BENEFITS	REFERENCE (SCAN FOR LINK)
LOW CARBON CITIES FRAMEWORK (LCCF)	KASA	Provide framework to achieve sustainable development that will help in reducing carbon emissions by measuring the impact of development decisions in terms of carbon emissions and abatement.	Urban Environment; Urban Transport; Urban Infrastructure; Building		Reduction performance will be awarded an environmental performance rating	
FEED-IN TARIFF (FIT)	SEDA	Mechanism under the Renewable Energy Policy to catalyse generation of Renewable Energy (RE) up to 30 MW in size.	Biogas; Biomass; Small Hydropower; Solar Photovoltaic		Reduce CO_2 emissions and secure domestic energy supply, and guarantee investment security for renewable energy investors	
GREEN ELECTRICITY TARIFF (GET)	KeTSA	Encourage the use and purchase on green electricity from large scale solar and hydroelectric plants along with supporting the nation aspiration in reducing the net-zero GHG emission by 2050.	Residential customer (100kWh per block); Non-residential customer (1000kWh per block)		Subscribers able to receive Malaysia Energy Certificate (mREC) based on international REC standards and exempted from ICPT charge	
MALAYSIA ELECTRICITY SUPPLY INDUSTRY TRUST ACCOUNT (MESITA)	KeTSA	Funding for programmes or projects that support the development of national power industry including renewable energy R&D, human resource and energy efficiency.	Electricity supply		Funding for programmes and projects	
ENERGY MANAGEMENT GOLD STANDARD (EMGS)	MGTC	Certification system delivered under the ASEAN Energy Management Scheme (AEMAS) based on excellence in energy management.	Energy management		Recognised as a leader in energy management	

3.2 TOWARDS GREEN RECOGNITION

This guideline presents recommendations and proposed actions for the forest operation sector to implement green practices in their daily operations. It is driven by the vision of establishing a Green Certificate that recognises and rewards sustainable practices within the forest operation industry.

To support the industry in implementing green practices, a comprehensive Green Certificate Roadmap has been developed specifically for forest operators. This roadmap serves as a strategic guide, assisting forest companies in adopting and implementing sustainable practices within their operations. It provides a structured approach to ensure that the industry is equipped with the necessary knowledge and resources to effectively integrate green practices.

The long-term goal is to enable forest companies that have successfully implemented green and best practices to apply for the Green Certificate. This certification would serve as a formal recognition of their commitment to sustainability and environmental stewardship. As part of the proposed roadmap, forest companies meeting the eligibility criteria for the Green Certificate may also benefit from proposed financing incentives and support.

By establishing the Green Certificate and associated benefits, the forest operation industry is encouraged to prioritize and embrace sustainable practices. This initiative not only acknowledges the efforts of forest companies in adopting green practices but also serves as a catalyst for knowledge sharing and collaboration across the sector. Ultimately, the Green Certificate aims to drive widespread adoption of sustainable practices, promote environmental protection, and contribute to the overall sustainability goals of the forest operation industry in Malaysia.

GREEN STRATEGIC ACTION IMPPLEMENTATION & OUTCOMES

PREPARATION AND TARGET SETTING

PERFORMANCE EVALUATION

SECTOR IDENTIFICATION

LEADING INDICATORS & SUSTAINABILITY PERFORMANCE IDENTIFICATION

SELF MONITORING & REPORTING

GREEN RECOGNITION & CERTIFICATION
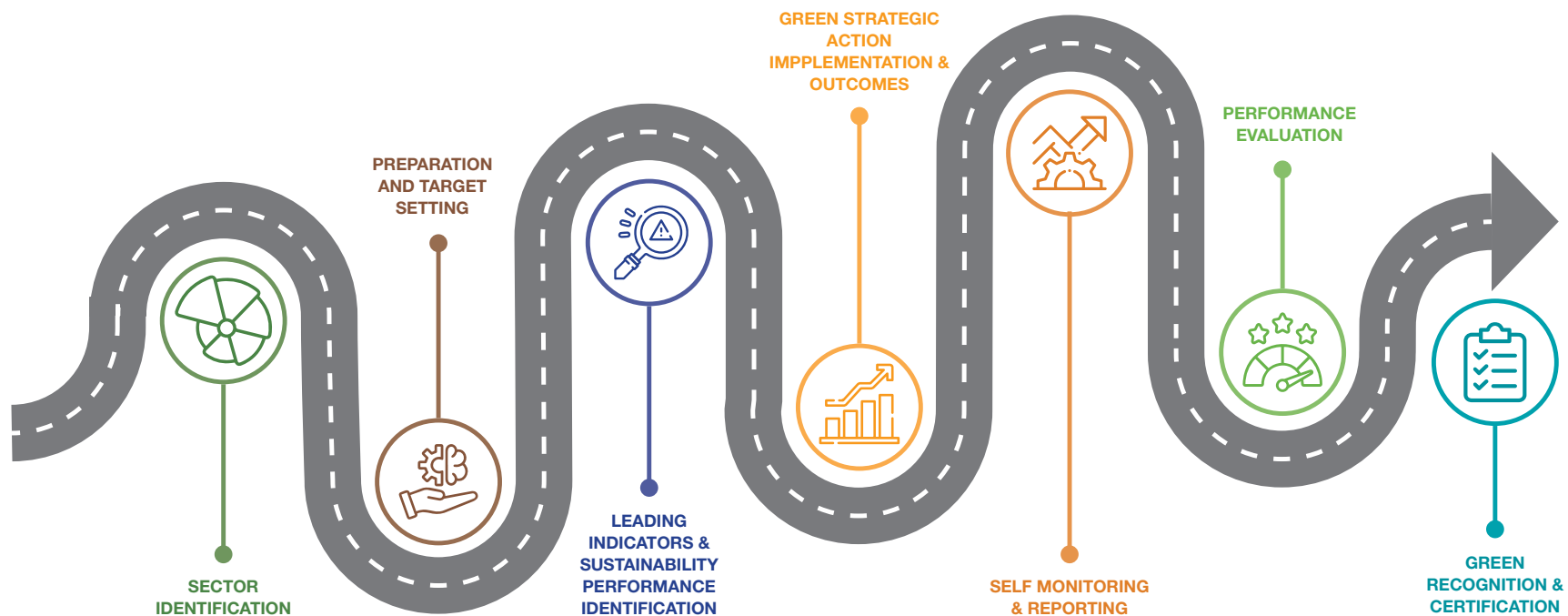
3.3 WAY FORWARD

To remain competitive and contribute to environmental protection in forest operations, businesses must proactively adopt green practices and integrate ESG factors into their operations. This includes adopting circular business models, embracing ESG disclosure, transitioning to renewable energy sources, implementing decarbonisation efforts, and exploring green financing and investment opportunities.

The integration of green practices within forest operations is essential for fulfilling environmental responsibilities and aligning with the broader ESG framework. Investors increasingly consider ESG factors when making decisions, recognising the value of sustainable and responsible forest management practices. Regulatory requirements emphasise the importance of ESG disclosure for companies in the forest operations industry.

By incorporating ESG disclosure, forest companies can communicate their environmental initiatives, such as implementing sustainable logging practices, implementing waste reduction measures, utilising renewable energy sources in operations, and undertaking efforts to mitigate climate change. Effective ESG disclosure enhances a company's reputation, attracts socially conscious investors, ensures regulatory compliance, and contributes to long-term value creation.

In evaluating the long-term sustainability and resilience of forest businesses, it is crucial to consider ESG factors alongside financial performance. This holistic approach enables companies to assess their environmental impact, social responsibility, and governance practices, ensuring alignment with sustainable development goals, investor expectations, and regulatory requirements.

Embracing ESG factors and integrating green practices in forest operations not only positions businesses as responsible environmental stewards but also provides a competitive edge in the market. By proactively addressing environmental challenges, adopting sustainable forestry practices, and incorporating ESG considerations, forest companies can secure their long-term viability, attract investment, comply with regulations, and contribute positively to the transition towards a sustainable and resilient economy.

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CASE STUDY 1

Sustainable forest management, evolution can be seen in forest operation activities, where the high impact of conventional logging, especially on the forest ecosystem, has been transformed into reduced impact logging practices and the use of green practices.

There are many ways of implementing green technology within forest operations. The decision to go 'green' may come from reducing carbon footprint, utilisation of RIL techniques, compliance with regulations, or contribution to society and the environment.

PGL

PGL VISION SDN. BHD.

COMPANY REG. NO. 0719049A

NATURE OF BUSINESS: LOGGING, PROCESSING AND TRADING OF TIMBER

APPROACH

- Use of RIL machine called "Log-Fisher" in forest harvest operation.

ADDED VALUE

- Logfisher timber harvester is based on concept of fishing.

- Been acknowledged as an effective and cost efficient alternative to existing low and reduced impact logging technologies.

BENEFITS

- RIL and Log-Fisher techniques greatly reduce damage to trees in residual stand and reduced the amount of ground area disturbed in harvesting area by conventional machinery (around 30%-50%). The result implies the benefits on the economic and ecological conservation.

CASE STUDY 2

ASRAMA RAYA
www.asramarayakt.com.my

ARSB

Asrama Raya Sdn. Bhd. (ARSB) was incorporated on the 13th November 1967. ARSB sawmill is the first sawmill in the country which has been given timber tracking certificates for exporting 'green' timber.

Received a *Well-Managed Nature Forest* certification under Forest Stewardship Council (FSC) and complies with the National Forest Stewardship Standard of Malaysia Principles & Criteria.

FSC

SUSTAINABLE DEVELOPMENT GOALS
15 LIFE ON LAND
Indicator 15.2.1
Progress towards sustainable forest management

RESPONSIBLE FORESTRY
CERTIFIED
SCS GLOBAL SERVICES

APPROACH

- Conducts selective logging based on SMS and RIL by using a Logfisher.

ADDED VALUE

- Improved Base Hydraulic Forest Harvesting Machine. Its customised and improved feature provides stability and power to perform a range of standard harvesting operations especially winching of logs from the forest in all directions and terrains for natural and plantation forests.

BENEFITS

- The Logfisher can reduce soil disturbance, especially in steep areas and reduce the potential for siltation of streams. The machine can reduce around 60% of fuel energy. The result implies the benefits on the economic and ecological conservation.

APPENDIX

GLOSSARY

ASSESSOR

An individual or a group of people being assigned to conduct a green practices assessment to measure level green practices performance of an organisation.

CIRCULAR ECONOMY

A circular economy is an economic system in which resources are used, reused, and recycled in a closed loop, rather than being extracted, used, and then discarded as waste. It is based on the principles of reducing, reusing and recycling, and it is designed to minimise waste and pollution while conserving natural resources.

ENVIRONMENTAL, SOCIAL AND GOVERNANCE

Set of criteria that measures the ethical and sustainability impacts of an investment in a company or business.

GREEN PRACTICES GUIDELINE

A document that provides guide for the industry in implementing green practices within their operations.

GREEN PRACTICES

Environmentally friendly actions, which promote environment protection and sustainable development.

GREENHOUSE GAS

Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrochlorofluorocarbons (HCFCs), ozone (O_3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). See carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbon, ozone, hydrofluorocarbon, perfluorocarbon, sulfur hexafluoride.

INDICATOR

A metrics concerning energy, water, waste, material, innovation and management that measures level of green practices of an organisation.

INSTRUMENT

A tool comprises of data collection form, instrument factsheet and rubric that is used by assessor to evaluate level of green practices in an organisation.

RUBRIC

A set of sustainable criteria for assessing level of green practices in an organisation.

SUSTAINABLE DEVELOPMENT GOALS

A universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

ACRONYM

3R	Reduce, reuse, recycle		**IPCC**	The Intergovernmental Panel on Climate Change
CO$_2$	Carbon dioxide		**LCA**	Life Cycle Analysis
COP26	The 2021 United Nations Climate Change Conference		**LCC**	Life Cycle Costing
CQI	Continuous Quality Improvement		**MGTC**	Malaysian Green Technology and Climate Change
DSTIN	Dasar Teknologi dan Inovasi Negara		**NDC**	Nationally Determined Contribution
ESG	Environmental, Social and Governance		**SDG**	Sustainable Development Goals
FGD	Focus Group Discussion		**SME**	Small Medium Enterprise
GDP	Gross Domestic Product		**SOP**	Standard Operating Procedure
GHG	Green House Gas		**SPAN**	Suruhanjaya Perkhidmatan Air Negara
GP	Green Practice		**TE**	Technical Expert
GT	Green Technology		**UN**	United Nation
GTMP	Green Technology Master Plan		**UNFCC**	The United Nations Framework Convention on Climate Change

DATA COLLECTION TEMPLATE

GENERAL INFORMATION		
AUDIT INFORMATION		
AUDIT	ITEMS	DESCRIPTION
1	Objective	:
2	Scope	:
3	Auditor's Name	:
INFORMATION OF PREMISE		
AUDIT	ITEMS	DESCRIPTION
1	Name of Premise	:
2	Address	:
3	Total No. of Employee	:
4	Operation Hours	:
5	Type of Sector	:
6	Year of Operation	:
7	History of DOE Enforcement Involvement	:

INDICATOR MATRIX

INDICATOR SUB INDICATOR		WEIGHTAGE BY SUB-INDICATOR	WEIGHTAGE BY INDICATOR
MATERIALS	Sustainable materials	50	10
	Sustainable services	50	
WASTE	Wastewater	N/A	20
	Non-Hazardous	70	
	Hazardous waste	30	
ENERGY	Emission Reduction	30	40
	Energy Efficiency	30	
	Energy Management System	10	
	Renewable Energy	30	
INNOVATION	Research and Development	50	10
	Knowledge transfer & Collaboration	50	
MANAGEMENT	Policy & Programme	30	20
	Green Procurement	40	
	Human Capital	50	
	TOTAL		100

EVALUATION INDICATOR MATRIX

INDICATOR	SUB INDICATOR	WEIGHTAGE BY SUB-INDICATOR	MARK BY SUBINDICATOR (A)	INPUT MARKS HERE	WEIGHTAGE BY INDICATOR (B)	MARK BY INDICATOR Σ(A)*(B)/100
MATERIALS	Sustainable materials	50	x / 4 * 50	x	10	
	Sustainable services	50	x / 4 * 50	x		
WASTE	Wastewater	N/A			20	
	Non-Hazardous	70	x / 4 * 70	x		
	Hazardous waste	30	x / 4 * 30	x		
ENERGY	Emission Reduction	30	x / 4 * 30	x	40	
	Energy Efficiency	30	x / 4 * 30	x		
	Energy Management System	10	x / 4 * 10	x		
	Renewable Energy	30	x / 4 * 30	x		
INNOVATION	Research and Development	50	x / 4 * 50	x	10	
	Knowledge transfer & Collaboration	50	x / 4 * 50	x		
MANAGEMENT	Policy & Programme	30	x / 4 * 30	x	20	
	Green Procurement	40	x / 4 * 40	x		
	Human Capital	30	x / 4 * 50	x		
			TOTAL		100	
			STAR RATING *(Please tick based on the star rating assessment criteria)*		1-Star	
					2-Star	
					3-Star	

STAR RATINGS (ASSESSMENT CRITERIA)

(60% - 70%)

Comply to all
regulatory requirements

Demonstrate leadership
in developing systematic
environmental reporting practical

(71% - 80%)

Exhibit characteristics
of being resource efficient

Demonstrating positive
impacts from green practices

Incorporate and implement continuous
quality improvement initiatives
throughout business operations

(81% - 100%)

Demonstrate integration of
governance framework related to
sustainability and circular economy

Demonstrate capacity in contributing
towards achieving national
decarbonisation targets

Demonstrates leadership in
developing, expanding and applying
new tech related to green practices

MARKS	STAR RATING
0	No Star
60	1 Star
71	2 Star
81	3 Star
100.1	Invalid

DATA COLLECTION FORM

MATERIAL INDICATOR

SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
		INDICATOR: MATERIAL		
		SUB-INDICATOR: SUSTAINABLE MATERIALS		
	4	Demonstration on purchase/utilisation of sustainable materials utilisation with specific direction/vision; with self-regulation implementation (evidence on correlation on sustainability goals); and received recognition/certification from third party/ies certificate body	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts containing specific policy statements or guidelines or instructions for green material application as well as the practice of self-regulation on the application (through monitoring) to show the correlation with the sustainability goal and to provide evidence of related certificate or proof of recognition.	
	3	Demonstration on purchase/utilisation of sustainable materials utilisation with specific direction/vision; with self-regulation implementation (evidence of correlation on sustainability goals)	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts containing specific policy statements or guidelines or instructions for green material application as well as the practice of self-regulation on the application (through monitoring) to show the correlation with the sustainability goal.	
	2	Demonstration on purchase/utilisation of sustainable materials utilisation with specific direction/vision	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts containing specific policy statements or guidelines or instructions for green material application.	
	1	Demonstration on purchase/utilisation of sustainable materials utilisation	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts.	
	0	None	No initiative at all	

	INDICATOR: MATERIAL			
	SUB-INDICATOR: SUSTAINABLE SERVICES			
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	Demonstration on purchase/utilisation of sustainable services utilisation with specific direction/vision; with self-regulation implementation (evidence on correlation on sustainability goals); and received recognition/certification from third party/ies certificate body	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts containing specific policy statements or guidelines or instructions for green services application as well as the practice of self-regulation on the application (through monitoring) to show the correlation with the sustainability goal and to provide evidence of related certificate or proof of recognition.	
	3	Demonstration on purchase/utilisation of sustainable services utilisation with specific direction/vision; with self-regulation implementation (evidence of correlation on sustainability goals)	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts containing specific policy statements or guidelines or instructions for green services application as well as the practice of self-regulation on the application (through monitoring) to show the correlation with the sustainability goal.	
	2	Demonstration on purchase/utilisation of sustainable services utilisation with specific direction/vision	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts containing specific policy statements or guidelines or instructions for green services application.	
	1	Demonstration on purchase/utilisation of sustainable services utilisation	*Company Sustainability Report:* A report published by a company or organisation about environmental, social, and governance (ESG) impacts.	
	0	None	No initiative at all	

WASTE INDICATOR

		INDICATOR: WASTE		
		SUB-INDICATOR: NON-HAZARDOUS		
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	Initiative/technology available (e.g., biogas capture facility and etc.); implemented; WITH monitoring in place; WITH ≥ 40% recycle rate; and WITH validation/certification/recognition	*Validation/certification/recognition:* Refers to documents issued by third party that confirms performance and achievement in meeting certain standard or criteria.	
	3	Initiative/technology available (e.g., biogas capture facility and etc.); implemented; WITH monitoring in place; WITH ≥ 40% recycle rate	*Monitoring records:* Refers to documents/records used as evidence and primary data for the purpose of calculating the intended goals and targets. Examples of records that can be referred to are record of wastes generated, recycled, reused, repurposed, disposed. Examples of CQI evidence including positive outcome to cost saving; OR profit generation; OR reduce environmental impact.	
	2	Initiative/technology available (e.g., biogas capture facility and etc.); implemented; WITH monitoring in place;	*Relevant contract agreements:* Documents referred to as evidence for indicating mutual obligations between the parties. Examples are agreement made by the organisation with the intention to manage hazardous waste in a sustainable manner.	
	1	Initiative/technology available (e.g., biogas capture facility and etc.)	*Purchasing records and documents:* Documents that serve as evidence of the organisation acquiring services or/and products/system.	
	0	NO initiative of waste diversion to disposal	*Installation/maintenance records:* Documents that serve as evidence for installation and maintenance of technologies in the organisation.	

		INDICATOR: WASTE		
		SUB-INDICATOR: HAZARDOUS WASTE		
SCORE PLEASE TICK (/)	**POINT**	**SCORE CRITERIA**	**DATA SOURCES/EVIDENCE**	**ATTACHMENT REFERENCE**
	4	Initiative/technology available; implemented; WITH monitoring in place; WITH ≥ 50% recycle rate; and WITH validation/certification/recognition	*Validation/certification/recognition:* Refers to documents issued by third party that confirms performance and achievement in meeting certain standard or criteria.	
	3	Initiative/technology available; implemented; WITH monitoring in place; WITH ≥ 50% recycle rate	*Monitoring records:* Refers to documents/records used as evidence and primary data for the purpose of calculating the intended goals and targets. Examples of records that can be referred to are record of wastes generated, recycled, reused, repurposed, disposed. Examples of continuous quality improvement (CQI) evidence including positive outcome to cost saving; OR profit generation; OR reduce environmental impact.	
	2	Initiative/technology available; implemented; WITH monitoring in place; WITH ≥ 50% recycle rate	*Relevant contract agreements:* Documents referred to as evidence for indicating mutual obligations between the parties. Examples are agreement made by the organisation with the intention to manage hazardous waste in a sustainable manner.	
	1	Initiative/technology available	*Purchasing records and documents:* Documents that serve as evidence of the organisation acquiring services or/and products/system.	
	0	NO initiative of waste diversion to disposal	*Installation/maintenance records:* Documents that serve as evidence for installation and maintenance of technologies in the organisation. Other initiatives including minimising the feed to avoid over generation of hazardous waste.	

ENERGY INDICATOR

INDICATOR: ENERGY				
SUB-INDICATOR: EMISSION REDUCTION				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	45% emission reduction achieved	GHG Inventory reports prepared in accordance to nationally or internationally recognised standards.	
	3	35% emission reduction achieved		
	2	25% emission reduction achieved		
	1	15% emission reduction achieved		
	0	No emission reduction achieved		

INDICATOR: ENERGY				
SUB-INDICATOR: ENERGY EFFICIENCY				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	8% of energy savings	*Energy consumption:* Meter energy usage readings (i.e., kWh, kJ, MMBTU), utility bills (i. e. kWh, kJ, MM BTU), or any other documents recording the energy consumption for the organisation.	
	3	6% of energy savings	*Fuel consumption:* Bill s of quantities for fuels (i.e., litres of fuel, kg of fuel, cu.ft of gases), or any ot her documents re cording the fuel consumption for the organisation.	
	2	4% of energy savings		
	1	2% of energy savings	*Certificates of analysis (COA):* COA for fu e ls sha ll be refe rred to determine calorific values of fuels used (if applicable).	
	0	No energy savings		

		INDICATOR: ENERGY		
		SUB-INDICATOR: ENERGY MANAGEMENT SYSTEM		
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	External certificat ion received for energy management system	*Organisation energy policies:* Organisation policies or guidelines specific to energy or main policy documents which specifically address energy efficiency plan and target.	
	3	Energy saving measure implemented; WITH systematic reporting and monitoring system; WITH energy pol icies in place	*Organisation mission and vision statements:* Organisation mission and vision statements specific to energy or main policy documents which specifically.	
	2	Energy saving measure implemented; WITH systematic reporting and monitoring system; WITHOUT energy policies in place	*Energy management activity*: Records and documentation related to energy management activity that include the energy management committee and energy audit.	
	1	Energy saving measure implemented; WITHOUT systematic reporting and monitoring system; WITHOUT energy policies in place	*Data related to energy management activity:* Records and documentation of energy consumption, renewable energy, energy saving and performance within the organisation.	
	0	No energy management system	Reports, reviews by third parties, or certifications received by the organisation based on locally or internationally recognised standards.	

INDICATOR: ENERGY				
SUB-INDICATOR: RENEWABLE ENERGY				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	40% of Renewable Energy used	*Energy consumption:* Meter energy usage readings (i.e., kWh, k.J, MMBTU), utility bills (i.e. kWh, k.J, MMBTU), or any ot her documents recording the energy consumption for the organisation.	
	3	30% of Renewable Energy used	*Renewable energy consumption:* Meter renewable energy production readings (i.e., kWh, k.J), utility bills (i .e., kWh, k.J, MMBTU), or any other documents recording the renewable energy consumption for the organisation.	
	2	20% of Renewable Energy used	*Fuel consumption:* Bills of quantities for fuels (i.e. litres of fuel, kg of fuel, cu. ft of gas,es), or any other documents recording the fuel consumption for the organisation.	
	1	10% of Renewable Energy used	*Certificates of analysis (COA):* COA for fuels shall be referred to determine calorific values of fuels used (if applicable).	
	0	No Renewable Energy used		

INNOVATION INDICATOR

INDICATOR: INNOVATION				
SUB-INDICATOR: RESEARCH AND DEVELOPMENT (R&D)				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	Visible Return on Value based on R&D pmcess/initiative/output managed by innovation unit/department/personnel, resulting in commercialisation/intellectual property filling/registration and award	***Proof of in-house R&D Process:***	
	3	Established in house R&D process to Green Practice/Sustaible Innitiative with proven investment managed by Innovation unit/department/personnel	*Organisational Structure:* Refers to systems which outlines how innovation activities are formalised through functions within an R&D unit with in the boundaries of the organisations under evaluation, OR	
	2	Established inhouse R&D process to Green Practice/Sustaible Innitiative managed by Innovation unit/department/personnel	*Appointment Letter or Minute Meeting indicating specific person-in-charge of an R&D project related to Green Practice, OR*	
	1	Established inhouse R&D process relating to Green Practice/Sustainable Innitiative	*Project Charter:* A document that describes an innovation project in its entirety. (Overview, an outline of scope, an approximate schedule, a budget estimate, anticipated risks, and key stakeholders	
	0	None	***Proof of R&D Investment***	
			Grant Proposal: A document proposing a research project requesting for sponsorship of that research, OR	
			Grant Award Document: A written agreement between the organisation and a grantee as the official notification of grant approval with evidence for contractual grant reporting, OR	
			Investment records: Financial documents/records used as evidence for internal and external investment of technology or system which enables innovation prooess/research/practise/development in the organisation	

INDICATOR: INNOVATION				
SUB-INDICATOR: RESEARCH AND DEVELOPMENT (R&D)				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
			Proof of R&D Outcome	
			Intellectual Property (IP): Provisional IP application document/ E-Filling document/published detailed of invention on intellectual protection within copyright, trademark, patents, geographical indications, plant varieties, industrial designs and semiconductor integrated circuit layout designs, OR	
			Recognition/Award/Certification: Refers to the state or quality innovation product/process/service that are recognized or acknowledged by ce rtified bodies, OR	
			Proof of Return on Value *Economic Value:* Project completion report or Financial accounting report outlining investment, revenue and net profit based on commercialisation/marketing attribution success of innovative green products/services, OR	
			Proof of Return on Value *Social Value:* Project completion report with evidence of applied/ implemented/reviewed innovation practices which leads to, preset goals that are measurable improvements on existing practices of identified community.	
			Proof of Return on Value *Project completion report with evidence of improvement on productivity/practice/System and resource and material efficiency leading to improved air and water quality/fewer waste/more renewable energy sources and other sustainable conditions*	

INDICATOR: INNOVATION				
SUB-INDICATOR: KNOWLEDGE TRANSFER AND COLLABORATION				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	Strategic partnership/Collaborative project **with signed MOU+MOA and visible Return on Value**	*Contract agreements:* Documents indicating mutual obligations between two or more parties such as LOI/NDA/MOU/MOA.	
	3	Strategic partnership/Collaborative projects **with signed MOU+MOA**	***Proof of R&D Outcome***	
	2	Strategic partnership/Collaborative projects **with signed MOU**	*Intellectual Property (IP):* Documents related to intellectual protection such as copyrights, trademarks, trade secret, industrial design, utility innovation or patent, OR	
	1	Strategic partnership/Collaborative projects **with NDA/LOI**	*Proof of Return on Value Economic Value:* Project complet ion re port or Financial accounting report outlining investment, revenue and net profit based on commercialisation/marketing attribution success of innovative green products/services, OR	
	0	None	*Proof of Return on Value Socia/Value:* Project completion report with evidence of a pplied/implemented/reviewed innovation practices which leads to preset goals that are measurable improvements on existing practices of identified cornmunity.*	
			Proof of Return on Value Project completion report with evidence of improvement on productivity/practice/System and resource and materialefficiency leading to improved air and water quality/fewer waste/more renewable energy sources and other sustainable conditions	

MANAGEMENT INDICATOR

INDICATOR: MANAGEMENT				
SUB-INDICATOR: POLICY AND PROGRAMME				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	A present of policy related to sustainability, participate in any sustainability programme, produce a report related to the sustainability programme, and receive recognition at National and International level.	*Policy or standards:* Refers to a written policy and/or international/ national standards used/implemented within the boundaries of the organisation.	
	3	A present of policy related to sustainability, participate in any sustainability programme, produce a report related to the sustainability programme and receive recognition or certification.	*Monitoring records:* Refe rs to documents/records used as evidence and primary data for the purpose of achieving the intended goals.	
	2	A present of policy related to sustainability, participate in any sustainability programme, and produce a report related to the sustainability programme.	*Contract agreements:* Documents referred to as evidence for indicating mutual obligations between the parties.	
	1	A present of policy related to sustainability and participate in any sustainability programme.		
	0	None		

INDICATOR: MANAGEMENT				
SUB-INDICATOR: GREEN PROCUREMENT				
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	A present of policy and practice of green procurement, record of purchases as evidence including eco-label certified services or/and products/system.	*Policy or standards:* Refers to a written policy and/or international/national standards used/implemented within the boundaries/organisations.	
	3	A present of policy and practice of green procurement and record of purchases as evidence.	*Monitoring records:* Refers to documents/records used as evidence and primary data for the purpose to achieve the intended goals.	
	2	A present of policy and practice of green procurement.	*Contract agreements:* Documents referred to as evidence for indicating mutual obligations between the parties.	
	1	A present of green procurement policy.	*Purchasing records and documents:* Documents that are serve as evidence of the organisation acquiring services or/and products/system.	
	0	None		

		INDICATOR: MANAGEMENT		
		SUB-INDICATOR: HUMAN CAPITAL		
SCORE PLEASE TICK (/)	POINT	SCORE CRITERIA	DATA SOURCES/EVIDENCE	ATTACHMENT REFERENCE
	4	A present of human capital policy development to establish lifelong learning culture.	*Policy or standards:* Refers to a written policy and/or international/ national standards used/implemented within the boundaries/ organisations.	
	3	Key performance indicator documented related to human capital development.	*Monitoring records:* Refers to documents/records used as evidence and primary data for the purpose to achieve the intended goals.	
	2	Mission and vision of the organisation related to human capital development.	*Contract agreements:* Documents referred to as evidence for indicating mutual obligations between the parties.	
	1	Minutes of meetings related to human capital development.	*Purchasing records and documents:* Documents that are serve as evidence of the organisation acquiring services or/and products/ system.	
	0	None		

INDICATOR INSTRUMENT FACTSHEET

INDICATOR: MATERIAL

SUB-INDICATOR: SUSTAINABLE MATERIALS

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns

a) Goal 12.4: Responsible management of chemical and waste

b) Goal 12.6: Encourage companies,a especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (target at Sustainable reporting in companies).

1.2. INDICATOR

Material

1.3. SUB-INDICATOR

Sustainable Materials

1.4. LAST UPDATE

3 January 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Services
- Fisheries (Aquaculture)
- Manufacturing
- Livestock
- Mining
- Forest operation
- Construction
- Agriculture & Plantation

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Organisation: The entity undergoing the evaluation.

Baseline year: A reference point in time against which measure of consumption and/or in the future are measured.

Sustainable material: Sustainable materials are materials that are produced and used in a way that minimises environmental impact and reduces the depletion of natural resources. These materials are often produced using renewable resources, are nontoxic, and are biodegradable or recyclable, for example, clay, rock, sand, bamboo, or materials with eco-label.

Circular economy: A circular economy is an economic system in which resources are used, reused, and recycled in a closed loop, rather than being extracted, used, and then discarded as waste. It is based on the principles of reducing, reusing and recycling, and it is designed to minimise waste and pollution while conserving natural resources.

Life Cycle Assessment: Life Cycle Assessment (LCA) is a methodology used to evaluate the environmental impact of a product or service over its entire life cycle. This includes the extraction of raw materials, production, transportation, use, and disposal or recycling of the product.

ESG: ESG stands for Environmental, Social and Governance. It is a set of criteria used to evaluate the sustainability and societal impact of an investment in an organisation.

Certification: Certification is the provision by an independent body or an authorised agency of written assurance that the product, service, or system in question meets specific requirements.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

2.2. CONCEPT

Not applicable.

2.3. UNIT OF MEASURE

Not applicable.

3. METHODOLOGY

3.1. DATA SOURCES

Company sustainability report: A report published by a company or organisation about environmental, social and governance (ESG) impacts.

Organisation sustainability policies: Organisation policies or guidelines specific to sustainability addressed in the company sustainability report.

Sustainability monitoring activity: Self-regulation implementation to show correlation with sustainability goals.

Certification or recognition of sustainable material: Certifications attained by the organisation (including from third parties) related to sustainable material.

3.2. DATA COLLECTION METHOD

Reference and citation to sections, parts, and/or entire documents as evidence. Documents cited shall specifically address the following aspects:

1. Evidence of company sustainability report

2. Evidence of policy for the application of green material

3. Evidence of self-regulation implementation relating to sustainability goals

4. Evidence of certification or recognition from other parties including third parties

3.3. ASSUMPTIONS AND UNCERTAINTIES

Not applicable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2. VALIDATION

1. GRI Standards

2. SASB Standards

4.3. QUALITY MANAGEMENT

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

ISO/CD 59004 Circular Economy – Terminology, Principles and Guidance for Implementation

5. REFERENCES

1. National Energy Efficiency Action Plan 2016-2025

2. Malaysia Renewable Energy Roadmap (MyRER)

3. Malaysia National Energy Policy (NEP) 2022-2040

4. he Sustainable Development Goals (SDGs)

INDICATOR: MATERIAL

SUB-INDICATOR: SUSTAINABLE SERVICES

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Encourage companies to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

Sustainable Development Goal 12: *Ensure sustainable consumption and production patterns*

a) Goal 12.1: Implement the 10-year sustainable consumption and production framework

b) Goal 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (target at Sustainable reporting in companies).

c) Goal 12.8: Promote universal understanding of sustainable lifestyles

1.2. INDICATOR

Material

1.3. SUB-INDICATOR

Sustainable Services

1.4. LAST UPDATE

18 January 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Services
- Fisheries (Aquaculture)
- Manufacturing
- Livestock
- Mining
- Forest operation
- Construction
- Agriculture & Plantation

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Organisation: The entity undergoing the evaluation.

Baseline year: A reference point in time against which measure of consumption and/or in the future are measured.

Sustainable material: Sustainable service is a service that fulfils customer needs and can be perpetuated for a long period of time without negatively influencing the natural and social environments. For example, certification or recognition like ISO 14000 or MyHijau, strategy/planning, technical support, testing, and verification.

Sustainable framework: A written document describing a framework for action to enhance international cooperation and accelerate the shift towards sustainable consumption and production (SCP) patterns in both developed and developing countries.

Life Cycle Assessment: Refers to increasing the sustainable management of resources and achieving resource efficiency along both production and consumption phases of the lifecycle, including resource extraction, the production of intermediate inputs, distribution, marketing, use, waste disposal and re-use of products and services.

Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

2.2.   CONCEPT

Not applicable.

2.3.   UNIT OF MEASURE

Not applicable.

3.   METHODOLOGY

3.1.   DATA SOURCES

Company sustainability report: A report published by a company or organisation about environmental, social and governance (ESG) impacts

Organisation sustainability policies: Organisation policies or guidelines specific to sustainability addressed in the company sustainability report.

Sustainability monitoring activity: Self-regulation implementation to show correlation with sustainability goals.

Certification or recognition of sustainable material: Certifications attained by the organisation (including from third parties) related to sustainable services.

3.2.   DATA COLLECTION METHOD

Reference and citation to sections, parts, and/or entire documents as evidence. Documents cited shall specifically address the following aspects:

5.   Evidence of company sustainability report

6.   Evidence of policy for the application of green services.

7.   Evidence of self-regulation implementation relating to sustainability goals

8.   Evidence of certification or recognition from other parties including third parties

3.3.   ASSUMPTIONS AND UNCERTAINTIES

Not applicable.

4.   OTHER METHODOLOGICAL CONSIDERATIONS

4.1.   COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2.   VALIDATION

1.   GRI Standards

2.   SASB Standards

3.   House Rule

4.3.   QUALITY MANAGEMENT

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

ISO/CD 59004 Circular Economy – Terminology, Principles and Guidance for Implementation

5.   REFERENCES

1.   National Energy Efficiency Action Plan 2016-2025

2.   Malaysia Renewable Energy Roadmap (MyRER)

3.   Malaysia National Energy Policy (NEP) 2022-2040

4.   The Sustainable Development Goals (SDGs)

INDICATOR: WASTE

SUB-INDICATOR: NON-HAZARDOUS

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

1. Goal 1: 40% recycling rate of solid waste from total non-hazardous waste generated by 2025.

2. Goal 2: 100% avoidance of waste to landfills by 2025.

3. Goal 3: 180 unit of biogas capture facility by 2030.

These goals are aligned with the world convention COP 26 by the UNFCC emphasising on the solid wastes recycling target, landfill avoidance, and reduction of carbon intensity (against GDP) in 2030 compared to 2005 level. It has been outlined that by 2030, 40% of the solid wastes generated shall be recycled, 100% avoidance of waste to the landfill, and there shall be 180 unit of biogas capture facility. These goals also map to SDG #12 - Sustainable consumption and production, specifically addressing target #12.3 - Substantially reduce waste generation through prevention, reduction, recycling, and reuse by 2030.

1.2. INDICATOR

Waste

1.3. SUB-INDICATOR

Non-hazardous waste

1.4. LAST UPDATE

11 April 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Services
- Fisheries (Aquaculture)
- Manufacturing
- Livestock
- Mining
- Forest operation
- Construction
- Agriculture & Plantation

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Baseline year: A reference point in time against which a measure of consumption and/or production in the present and/or future are measured.

Biogas Capture Facility: A facility that capture biogas released as a result of waste degradation.

Boundary: A defined border that accounts and limits the key business activities and processes which forms a basis of the study or analysis within the reporting period.

Functional Unit: A specific/selected amount of feed or product or service defined as a basis of calculation, such as mass (weight), volume, and units.

Non-Hazardous Wastes: Any form of materials that are discarded from a process/activity, and in this document, specifically refers to solid form of waste materials.

Non-hazardous waste loss: Any leakage/spills along the waste stream before or after treatment process.

Recycling: Process in converting waste materials into new materials or objects.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

2.2. CONCEPTS

Not applicable.

2.3. UNIT OF MEASURE

1. Percentage (%) of recycling of non-hazardous waste within the organisation
2. Number of biogas capture facility

3. METHODOLOGY

3.1. DATA SOURCES

Validation/certification/recognition: Refers to documents issued by third party that confirms performance and achievement in meeting certain standard or criteria.

Monitoring records: Refers to documents/records used as evidence and primary data for the purpose of calculating the intended goals and targets. Examples of records that can be referred to are record of wastes generated, recycled, reused, repurposed, disposed. Example of CQI evidence including positive outcome to cost saving; OR profit generation; OR reduce environmental impact.

Relevant contract agreements: Documents referred to as evidence for indicating mutual obligations between the parties. Examples are agreement made by the organisation with the intention to manage hazardous waste in a sustainable manner.

Purchasing records and documents: Documents that serve as evidence of the organisation acquiring services or/and products/system.

Installation/maintenance records: Documents that serve as evidence for installation and maintenance of technologies in the organisation.

3.2. DATA COLLECTION METHOD

Observations: Observations are made during the site visit to understand the actual case scenario of the green initiative implementation within the boundaries of the organisation.

Interviews: Interviews with respondent carried out to acquire insight of the processes/activities involved within the boundaries of the organisation.

Questionnaires/surveys: A set of questions designed for respondent to acquire insight of the processes/activities involved within the boundaries of the organisation.

Documents reviews: Documents reviewed during the site visit to support the observation.

Evidence:
1. Initiative proposal: Business or project planning with budget allocation.

2. Evidence of initiatives-
   Dedicated space/storage of non-hazardous waste; purchasing record, or installation record; transportation record (e.g., no trips/schedule to transport the waste to dedicated disposal/recycling premise) presence of initiative/unit/facility/equipment/system being validated.

3. Policy in place, documented (e.g., minutes of meeting/policy document/annual budget approval) and disseminated.

4. Monitoring record– look for current record and check for frequency monitoring.

5. Data availability at selected baseline year on the amount of non-hazardous waste recycled, amount of non-hazardous waste disposed, and amount of nonhazardous waste generated. At least any two data listed must be available to allow calculation on non-hazardous waste recycle.

6. Evidence of recycling by third parties e.g., receipt/invoice/ financial report etc.

7. Validation of recycling by third parties e.g., contract/validation report/audit report.

8. Evidence of continuous quality improvement (CQI) exercise such as minute of meeting/CQI report. Example of CQI is performance of the selected contractor.

9. Evidence of recognition by third party such as validation or certification or award.

3.3. COMPUTATION

Selecting a baseline year;
Percentage (%) of recycling non-hazardous waste = [Amount of recycling nonhazardous waste/Total amount of non-hazardous waste generated] × 100; where:

Amount of recycling non-hazardous waste = Amount of non-hazardous waste generated – Amount of non-hazardous waste disposed.

Total amount of non-hazardous waste generated is the summation of all wastes generated from the process/activity within the boundary.

3.4. ASSUMPTIONS AND UNCERTAINTIES

Non-hazardous waste loss during the activities within the defined boundary is assumed to be negligible.

Secondary data will be used in the event of primary data is unavailable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2. VALIDATION

Not applicable.

4.3. QUALITY MANAGEMENT

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

5. REFERENCES

1. Green Technology Master Plan (GTMP) 2017 – 2030.

2. Sustainable Development Goals (SDG) 2030.

INDICATOR: WASTE

SUB-INDICATOR: HAZARDOUS WASTE

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: 50% recycling rate of hazardous waste from the total hazardous waste generated by 2030

Goal 2: 40% recycling rate of solid waste from total waste generated by 2025

Goal 3: 100% avoidance of waste to landfill/zero waste to landfill by 2025

These goals are aligned with the GTMP 2017-2030 prepared by the Ministry of Energy, Green Technology and Water Malaysia emphasising on the hazardous waste recycling targets. It has been outlined that by 2030, 50% of the hazardous wastes generated from the industrial/sectoral activities shall be recycled. On top of that, the selected goals also addressed the target set by the world convention COP 26 by the UNFCC emphasising on achieving 40% recycling rate and 100% avoidance/zero waste directed to the landfill by 2025. These goals are also mapped to SDG #12 - Sustainable consumption and production, specifically addressing target #12.3 - Substantially reduce waste generation through prevention, reduction, recycling, and reuse by 2030.

1.2. INDICATOR

Waste

1.3. SUB-INDICATOR

Hazardous waste

1.4. LAST UPDATE

8 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Services
- Manufacturing
- Livestock
- Mining
- Forest operation
- Construction
- Agriculture & Plantation

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Baseline year: A reference point in time against which a measure of consumption and/or production in the present and/or future are measured.

Boundary: A defined border that accounts and limits the key business activities and processes which forms a basis of the study or analysis within the reporting period.

Functional Unit: A specific/selected amount of feed or product or service defined as a basis of calculation, such as mass (weight), volume, and units.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

Recycling: Process in converting waste materials into new materials or objects.

Scheduled Waste: Scheduled waste is any waste that has hazardous characteristics that have the potential to negatively impact the public and the environment. A total of 77 types of scheduled waste are listed under the First Schedule, Environmental Quality (Scheduled Waste) Regulations 2005, and the management of such waste shall be in accordance with the provisions under the above Regulations.

Waste loss: Any leakage/spills along the waste stream before or after treatment process.

2.2. CONCEPT

Not applicable.

2.3. UNIT OF MEASURE

Percentage (%) of recycling of hazardous waste within the organisation.

3. METHODOLOGY

3.1 DATA SOURCES

Validation/certification/recognition: Refers to documents issued by third party that confirms performance and achievement in meeting certain standard or criteria.

Monitoring records: Refers to documents/records used as evidence and primary data for the purpose of calculating the intended goals and targets. Examples of records that can be referred to are record of wastes generated, recycled, reused, repurposed, disposed. Example of continuous quality improvement (CQI) evidence including positive outcome to cost saving; OR profit generation; OR reduce environmental impact.

Relevant contract agreements: Documents referred to as evidence for indicating mutual obligations between the parties. Examples are agreement made by the organisation with the intention to manage hazardous waste in a sustainable manner.

Purchasing records and documents: Documents that serve as evidence of the organisation acquiring services or/and products/ system.

Installation/maintenance records: Documents that serve as evidence for installation and maintenance of technologies in the organisation. Other initiatives including minimising the feed to avoid over generation of hazardous waste.

3.2 DATA COLLECTION METHOD

Observations: Observations are made during the site visit to understand the actual case scenario of the green initiative implementation within the boundaries of the organisation.

Interviews: Interviews with respondent carried out to acquire insight of the processes/activities involved within the boundaries of the organisation.

Questionnaires/surveys: A set of questions designed for respondent to acquire insight of the processes/activities involved within the boundaries of the organisation.

Documents reviews: Documents reviewed during the site visit to support the observation.

Evidence:

1. Initiative proposal: Business or project planning with budget allocation.

2. Evidence of initiatives-

   - Dedicated space/storage of schedule waste; valid licence from regulatory body (special management) permit; purchasing record, or installation record; maintenance record; transportation record (e.g., no trips/schedule to transport the waste to dedicated disposal/recycling premise) presence of initiative/unit/facility/equipment/ system being validated.

   - Policy in place, documented (e.g., minutes of meeting/ policy document/annual budget approval) and disseminated.

- Monitoring record– look for current record and check for frequency of monitoring.

- Data availability at selected baseline year on the amount of schedule waste recycle, amount of schedule waste disposed, and amount of schedule waste generated. At least any two data listed must be available to allow calculation on schedule waste recycle.

3. Evidence of recycling by third parties e.g., receipt/invoice/financial report etc.

4. Validation of recycling by third parties e.g., contract/validation report/audit report.

5. Evidence of continuous quality improvement (CQI) exercise such as minute of meeting/CQI report. Example of CQI is performance of the selected contractor.

6. Evidence of recognition by third party such as validation or certification or award.

3.3 COMPUTATION

$$\text{Percentage (\%) of hazardous waste recycled} = \frac{\text{Amount of hazardous waste recycled}}{\text{Amount of hazardous waste generated}} \times 100$$

where;

Amount of hazardous waste recycled = Amount of hazardous waste generated – Amount of hazardous waste disposed.

Total amount of hazardous waste generated is the summation of all hazardous waste generated from the process/activity within the boundary.

3.4 ASSUMPTIONS AND UNCERTAINTIES

- Instrument applicability is limited to the activities within the defined boundary.
- Secondary data will be used in the event of primary data is unavailable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1 COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2 VALIDATION

Not applicable.

4.3 QUALITY MANAGEMENT

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework

ISO/CD 59004 Circular Economy – Terminology, Principles and Guidance for Implementation

5. REFERENCES

1. Green Technology Master Plan (GTMP) 2017 – 2030.

2. Sustainable Development Goals (SDG) 2030.

3. "Malaysia - High-Level Segment Statement COP 26." Unfccc.int, 11 Nov. 2021, https://unfccc.int/documents/310827

INDICATOR INSTRUMENT FACTSHEET

INDICATOR: ENERGY

SUB-INDICATOR: EMISSION REDUCTION

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Nationally Determined Contribution (NDC) of 45% carbon intensity reduction in 2030 compared to 2005 level.

The goal of this instrument is mapped to the following global goals and National targets:

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns

Goal 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (target at Sustainable reporting in companies).

National Commitment at COP – Nationally Determined Contribution (NDC) of 45% carbon intensity reduction in 2030 compared to 2005 level.

1.2. INDICATOR

Energy

1.3. SUB-INDICATOR

Emission Reduction

1.4. LAST UPDATE

3 January 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Organisation: The entity undergoing the evaluation.

Energy: Energy resources, which refer to substances like fuels, petroleum products, heating and cooling, and electricity in general, because a significant portion of the energy contained in these resources can easily be extracted to serve a useful purpose.

Energy consumption: Energy usage by the organisation and its sub-entities for its operations and activities.

Energy savings: Energy consumption reduction measured against a baseline year.

Emission: Emission herein refers to greenhouse gas (GHG). GHG is a gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect. The primary greenhouse gases in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. GHG emissions herein refers to all the GHGs and are collectively reported in carbon dioxide equivalent (CO_2e).

Baseline year: A reference point in time against which measure of consumption and/or in the future are measured.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

GHG inventory: A list of emission sources and the associated emissions quantified using standardised methods.

Scope 1: Direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organisation (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles).

Scope 2: Indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling.

Scope 3: Indirect GHG emissions associated with activities from assets not owned or controlled by the reporting organisation.

2.2 UNIT OF MEASURE

Percentage (%) reduction in emissions by an organisation within its operations in percentage with reference to a selected baseline year.

3. METHODOLOGY

3.1 DATA SOURCES

GHG Inventory reports prepared in accordance to nationally or internationally recognised standards.

3.2 DATA COLLECTION METHOD

GHG Inventory:

1. The emissions for the reporting period shall be the total GHG emissions generated by the organisation for the reporting period in CO_2e.

2. The total GHG emissions generated shall consider the total of Scope 1 and Scope 2 emissions generated by the organisation for the reporting period.

3. If present, the Scope 3 emission shall be considered for computing the total emissions.

4. Reports generated by the "Sistem Pengurusan dan Pemantauan Industri Hijau" provided by Department of Environment Malaysia can serve as evidence to represent the total GHG emissions for the organisation for the reporting period.

5. Reports and certification by national or international standards such as the ISO 14064 can serve as evidence to represent the total GHG emissions for the organisation for the reporting period.

Observations: Observations are made during the site visit to understand the actual case scenario of the green initiative implementation within the boundaries of the organisation.

Interviews: Interviews with respondent carried out to acquire insight of the processes/activities involved within the boundaries of the organisation.

Questionnaires/surveys: A set of questions designed for respondent to acquire insight of the processes/activities involved within the boundaries of the organisation.

Documents reviews: Documents reviewed during the site visit to support the observation.

3.3 COMPUTATION

The emission reduction can be calculated using the following equation:

$$\text{Emission reduction} = \frac{\left[\begin{array}{c}\text{Total emissions} \\ \text{for the reporting} \\ \text{period (kg CO}_2\text{e)}\end{array} - \begin{array}{c}\text{Total emissions} \\ \text{for the baseline} \\ \text{year(kg CO}_2\text{e)}\end{array}\right]}{\begin{array}{c}\text{Total emissions for the} \\ \text{baseline year (kg CO}_2\text{e)}\end{array}}$$

3.4 ASSUMPTIONS AND UNCERTAINTIES

The uncertainties reported within the organisation's GHG inventory shall be noted.

Any and all averaging approach to GHG data shall be noted and wherever practicably possible the uncertainties shall be quantified.

GHG emissions shall account for Scope 1 and Scope 2 emissions for the organisation.

Scope 3 emissions may be included in the calculation. If Scope 3 emissions are included, values of Scope 3 emissions shall be considered throughout all the expressions.

Any omissions shall be clearly noted with justifications.

Calculation methods to comply with GHG Protocol Standards or IPCC standards or ISO 14064 standards or any other internationally recognise standards.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1 COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2 VALIDATION

The review or validation of information and GHG inventory by the organisation shall be noted.

4.3 QUALITY MANAGEMENT

Any certification obtained with regard to the organisation's carbon emissions and management shall be noted.

5. REFERENCES

1. National Energy Efficiency Action Plan 2016–2025.
2. Malaysia Renewable Energy Roadmap (MyRER).
3. Dasar Tenaga Negara (DTN) 2022–2040.
4. The Sustainable Development Goals (SDGs).

INDICATOR: ENERGY

SUB-INDICATOR: ENERGY EFFICIENCY

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Energy saving meeting the National energy savings target of 8% by 2025.

The goal of this instrument is mapped to the following global goals and National targets:

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns

Goal 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (target at Sustainable reporting in companies).

National Energy Efficiency Action Plan 2016–2025:

1. 52,233 GWh of energy savings (8.0%)

2. 37,702 kt CO_2 equivalent reduction

1.2. INDICATOR

Energy

1.3. SUB-INDICATOR

Energy Efficiency

1.4. LAST UPDATE

3 January 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Fisheries (Aquaculture)
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Organisation: The entity undergoing the evaluation..

Energy: Energy resources, which refer to substances like fuels, petroleum products, heating and cooling, and electricity in general, because a significant portion of the energy contained in these resources can easily be extracted to serve a useful purpose.

Energy consumption: An energy usage by the organisation and its sub-entities for its operations and activities.

Energy savings: An energy consumption reduction measured against a baseline year.

Baseline year: A reference point in time against which a measure of consumption and/or production in the present and/or future are measured.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

Certified M & V Professional: A certified professional that qualifies to conduct measurement and verification activities according to guidelines or standards for reporting energy savings.

2.2. CONCEPT

Not applicable.

2.3. UNIT OF MEASURE

Percentage (%) of electricity and fuel consumption reduction measured against the baseline year.

3. METHODOLOGY

3.1. DATA SOURCES

Energy consumption: Meter energy usage readings (i.e., kWh, kJ, MMBTU), utility bills (i.e., kWh, kJ, MMBTU), or any other documents recording the energy consumption for the organisation.

Fuel consumption: Bills of quantities for fuels (i.e., litres of fuel, kg of fuel, cu. ft of gases), or any other documents recording the fuel consumption for the organisation.

Certificates of analysis (COA): COA for fuels shall be referred to determine calorific values of fuels used (if applicable).

3.2. DATA COLLECTION METHOD

Energy consumption:

1. Meter usage reading showing a consumption of energy over a period of time. Typically, meter reading is provided with a monthly time span. The total energy consumed shall be computed by taking the total meter readings for individual months over the period of the reporting year. In the event that more than one energy source is available, the sum of the meter readings shall be considered.

2. If there are more than one type of energy being consumed, a common energy unit shall be utilised. (e.g., MWh, MJ)

3. Other documents that can be used as evidence are purchase invoices received by utility providers or suppliers for energy purchased with the assumption that the energy purchased is consumed within the reporting period.

Fuel consumption:

1. Bills of quantities of fuel for fuels purchased shall be used to represent consumption of fuel over a period of time. The total fuel consumed shall be computed by taking the total quantities for the period of the reporting year. In the event that more than one fuel source is consumed, the sum of the quantities of fuel consumed shall be considered.

2. Other forms of evidence acceptable include, purchase invoices, bill of lading, and other similar documents.

3. If there are more than one type of fuel being consumed, a common energy unit shall be utilised. (e.g., MWh, MJ)

4. The energy unit of fuels shall be computed by multiplying the calorific value (e.g., J/kg, kJ/l) of the fuel with the quantity (e.g., kg, l). Refer to the Appendix for the list of common calorific value that can be used as reference. In the event of fuels not listed in the Appendix, the assessor shall request from the organisation for such information accompanied by respective reference document (e.g., certificates of analysis for fuel calorific value, literature reference).

5. Other documents that can be used as evidence are purchase invoices received by utility providers or suppliers for fuel purchased with the assumption that the energy purchased is consumed within the reporting period.

Observations: Observations are made during the site visit to understand the actual case scenario of the green initiative implementation within the boundaries of the organisation.

Interviews: Interviews with respondent carried out to acquire insight of the processes/activities involved within the boundaries of the organisation.

Questionnaires/surveys: A set of questions designed for respondent to acquire insight of the processes/activities involved within the boundaries of the organisation.

Documents reviews: Documents reviewed during the site visit to support the observation.

3.3. COMPUTATION

The energy and fuel saving for the reporting period can be calculated using the following equations:

Percentage (%) of energy saving =

$$\frac{\begin{array}{cc}\text{Total energy consumed} & \text{Total energy consumed} \\ \text{for the year of reporting} & - \quad \text{for the baseline year} \\ \text{(units for energy)} & \text{(unit for energy)}\end{array}}{\begin{array}{c}\text{Total energy consumed for the baseline year} \\ \text{(unit for energy)}\end{array}} \times 100\% \quad (1)$$

Percentage (%) of fuel saving =

$$\frac{\begin{array}{cc}\text{Total fuel consumed} & \text{Total fuel consumed} \\ \text{for the year of reporting} & - \quad \text{for the baseline year} \\ \text{(unit for fuel)} & \text{(unit for fuel)}\end{array}}{\begin{array}{c}\text{Total energy consumed for the baseline year} \\ \text{(unit for fuel)}\end{array}} \times 100\% \quad (2)$$

NB: Negative (%) indicates there is savings, positive (%) indicates there is no savings

3.4. ASSUMPTIONS AND UNCERTAINTIES

Wherever fuel characteristic information is used for calculations, it shall be noted that the averaging of such characteristics (i.e., calorific value) contributes to uncertainties.

Any and all averaging approach to consumption data shall be noted and wherever practicably possible the uncertainties shall be quantified.

Total energy consumed for the reporting period shall be calculated based on the actual consumption of energy for each month within the reporting period. In the event of data unavailability, average consumptions can be provided. Averaging approaches and assumptions made should be described in sufficient detail.

Total fuel consumed for the year of reporting shall be calculated based on the actual consumption of fuel for each month within the reporting period. Each type of fuel should be calculated separately.

Suggested unit for fuel as follows:

- Liquid fuel (i.e., petrol, diesel, oil, etc.): litres of fuel
- Solid fuel (i.e., coal, woodchip, etc): kg of fuel
- Gaseous fuel (i.e., natural gas, LPG, etc.): MMBTU or cu. ft. of gases

If the organisation is reporting both energy and fuels, the energy units should be standardised in MWh or MJ and reported in combination.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2. VALIDATION

Measurement and Verification (M&V) report to verify savings endorsed by certified M & V professional.

4.3. QUALITY MANAGEMENT

Not applicable.

5. REFERENCES AND DOCUMENTATION

1. National Energy Policy (2022–2040).
2. National Energy Efficiency Action Plan 2016–2025.
3. The Sustainable Development Goals (SDGs).

INDICATOR: ENERGY

SUB-INDICATOR: ENERGY MANAGEMENT SYSTEM

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Energy saving meeting the National energy savings target of 8% by 2025.

The goal of the Energy: Energy Efficiency instrument is mapped to the following global goals and National targets:

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns

Goal 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (target at Sustainable reporting in companies).

National Energy Efficiency Action Plan 2016-2025

1. Target of 52,233 GWh of energy savings (8.0%)

2. Target of 37,702 kt CO2 equivalent reduction

Malaysia Renewable Energy Roadmap (MyRER)

National aspiration of 31% renewable energy (RE) capacity by 2025 and 40% by 2035

Dasar Tenaga Negara (DTN) 2022-2040

National target set for RE at 18,431MW in 2040.

1.2. INDICATOR

Energy

1.3. SUB-INDICATOR

Energy Management Systems.

1.4. LAST UPDATE

3 January 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Organisation: The entity undergoing the evaluation.

Energy: Energy resources, which refer to substances like fuels, petroleum products, heating and cooling, and electricity in general, because a significant portion of the energy contained in these resources can easily be extracted to serve a useful purpose.

Renewable energy: Energy resources that is collected from renewable resources that are naturally replenished on a human timescale. It includes sources such as sunlight, wind, the movement of water, and geothermal heat.

Energy consumption: An energy usage by the organisation all it any sub-entities for its operations and activities.

Energy Management System: A set of policies and procedures integrated and put into practice to track, analyse, and plan for energy usage in an organisation.

Energy savings: An energy consumption reduction measured against a baseline year.

Baseline year: A reference point in time against which measure of consumption and/or in the future are measured.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

2.2. CONCEPT

Not applicable.

2.3. UNIT OF MEASURE

Not applicable.

3. METHODOLOGY

3.1. DATA SOURCES

Organisation energy policies: Organisation policies or guidelines specific to energy or main policy documents which specifically address energy efficiency plan and target.

Organisation mission and vision statements: Organisation mission and vision statements specific to energy or main policy documents which specifically address energy efficiency.

Energy management activity: Records and documentation related to energy management activity that include the energy management committee and energy audit.

Data related to energy management activity: Records and documentation of energy consumption, renewable energy, energy saving and performance within the organisation.

Reports, reviews by third parties, or certifications received by the organisation based on locally or internationally recognised standards.

Company policies, mission, and vision statements for continuous improvement.

3.2. DATA COLLECTION METHOD

Organisation energy policies:

1. Organisation policies or guidelines specific to energy or main policy documents which specifically address energy efficiency plan and target.

2. Statements within the policy describing energy management systems can be used as evidence. Statements describing targets for energy reduction, energy efficiency efforts, and any statements describing efforts or targets in achieving energy efficiency, increasing renewable energy mix, increasing renewable fuel mix shall also be considered.

Organisation mission and vision statements:

1. Organisation mission or vision statements specific to energy or organisation aspiration documents which specifically address energy efficiency plan and target.

2. Statements within the mission or vision statements describing energy management systems can be used as evidence. Statements within mission or vision statements describing targets for energy reduction, energy efficiency efforts, and any statements describing efforts or targets in achieving energy efficiency, increasing renewable energy mix, increasing renewable fuel mix shall also be considered.

3. Organisation mission and vision statements specific to energy or main policy documents which specifically address energy efficiency.

Energy management activity:

1. Documents, records, logbooks, minutes of meetings, and any written documentation related to energy management activity. This may also include documents describing activities by the energy management committee and energy audit.

2. Any form of documentation, including media such as videos and pictures related to energy management activity may also be considered as evidence.

Data related to energy management activity:

1. Records and documentation of energy consumption, renewable energy, energy saving and performance within the organisation.

2. Documents, records, logbooks, minutes of meetings, and any written documentation of data related to energy management activity. This may also include documents recording data activities by the energy management committee and energy audit.

Organisation mission and vision statements: Organisation mission and vision statements specific to energy or main policy documents which specifically address energy efficiency.

Energy management activity: Records and documentation related to energy management activity that include the energy management committee and energy audit.

Data related to energy management activity: Records and documentation of energy consumption, renewable energy, energy saving and performance within the organisation.

Reports, reviews by third parties, or certifications received by the organisation based on locally or internationally recognised standards.

Company policies, mission, and vision statements for continuous improvement.

Reference and citation to sections, parts, and/or entire documents as evidence. Documents cited shall specifically address the following aspects:

1. Evidence of a policy for more efficient use of energy.

2. Evidence of fixed targets and objectives to meet the policy.

3. Evidence of the usage data to better understand and make decisions about energy use.

4. Evidence of the performance of the policy.

5. Evidence of a continuous improvement in energy management.

3.3. ASSUMPTIONS AND UNCERTAINTIES

Not applicable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2. VALIDATION

1. ISO 50001:2018 Energy Management System.

2. AEMAS Energy Management Gold Standard.

4.3. QUALITY MANAGEMENT

Not applicable.

5. REFERENCES

1. National Energy Efficiency Action Plan 2016–2025

2. Malaysia Renewable Energy Roadmap (MyRER).

3. Dasar Tenaga Negara (DTN) 2022–2040.

4. The Sustainable Development Goals (SDGs).

INDICATOR: ENERGY

SUB-INDICATOR: RENEWABLE ENERGY

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: National target of 31% RE (renewable energy) capacity mix in 2025, and 40% by 2035.

The goal of this instrument is mapped to the following global goals and National targets:

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns.

Goal 12.6: Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (target at Sustainable reporting in companies).

National Energy Efficiency Action Plan 2016 – 2025:

1. 52,233 GWh of energy savings (8.0%)

2. 37,702 ktCO2 equivalent reduction

Malaysia Renewable Energy Roadmap (MyRER)

National aspiration of 31% renewable energy (RE) capacity by 2025 and 40% by 2035.

Dasar Tenaga Negara (DTN) 2022 – 2040

National target set for RE at 18,431MW in 2040.

1.2. INDICATOR

Energy

1.3. SUB-INDICATOR

Renewable Energy

1.4. LAST UPDATE

13 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Organisation: The entity undergoing the evaluation.

Energy: Energy resources, which refer to substances like fuels, petroleum products, heating and cooling, and electricity in general, because a significant portion of the energy contained in these resources can easily be extracted to serve a useful purpose.

Renewable energy: Energy resources that is collected from renewable resources that are naturally replenished on a human timescale. It includes sources such as sunlight, wind, the movement of water, and geothermal heat.

Renewable fuel: Fuel resources that is produced from renewable resources. Examples include biofuels and Hydrogen fuel. This is in contrast to non-renewable fuels such as natural gas, LPG, petroleum, coal, and other fossil fuels and nuclear energy.

Energy consumption: An energy usage by the organisation and all its sub-entities for its operations and activities.

Energy savings: An energy consumption reduction measured against a baseline year.

Reporting period: The time span for which the instrument assesses the organisation. Unless required otherwise time span should be one year.

2.2. UNIT OF MEASURE

Percentage (%) of renewable energy used with reference to the total energy used within the organisation.

Percentage (%) of renewable fuel used with reference to the total fuel used within the organisation.

3. METHODOLOGY

3.1. DATA SOURCES

Energy consumption: Meter energy usage readings (i.e., kWh, kJ, MMBTU), electricity bills (i.e., kWh, kJ, MMBTU), or any other documents recording the energy consumption for the organisation.

Renewable energy consumption: Meter renewable energy production readings (i.e., kWh, kJ), utility bills (i.e., kWh, kJ, MMBTU), or any other documents recording the renewable energy consumption for the organisation.

Fuel consumption: Bills of quantities for fuels (i.e., litres of fuel, kg of fuel, cu.ft of gases), or any other documents recording the fuel consumption for the organisation.

Certificates of analysis (COA): COA for fuels shall be referred to determine calorific values of fuels used (if applicable).

3.2. DATA COLLECTION METHOD

Energy consumption:

1. Meter usage reading showing a consumption of energy over a period of time. Typically, meter reading is provided with a monthly time span. The total energy consumed shall be computed by taking the total meter readings for individual months over the period of the reporting year. In the event that more than one energy source is available, the sum of the meter readings shall be considered.

2. If there are more than one type of energy being consumed, a common energy unit shall be utilised. (e.g., MWh, MJ)

3. Other documents that can be used as evidence are purchase invoices received by utility providers or suppliers for energy purchased with the assumption that the energy purchased is consumed within the reporting period.

Renewable Energy consumption:

1. Meter usage reading showing a generation of renewable energy over a period of time. Typically, meter reading is provided with a monthly time span. The total renewable energy generated shall be computed by taking the total meter readings for individual months over the period of the reporting year. In the event that more than one energy source is available, the sum of the meter readings shall be considered.

2. If there are more than one type of renewable energy being generated, a common energy unit shall be utilised. (e.g., MWh, MJ)

3. Other documents that can be used as evidence are purchase invoices received by utility providers or suppliers for energy purchased with the assumption that the energy purchased is consumed within the reporting period.

Fuel consumption:

1. Bills of quantities of fuel for fuels purchased shall be used to represent consumption of fuel over a period of time. The total fuel consumed shall be computed by taking the total quantities for the period of the reporting year. In the event that more than one fuel source is consumed, the sum of the quantities of fuel consumed shall be considered.

2. Other forms of evidence acceptable include, purchase invoices, bill of lading, and other similar documents.

3. If there are more than one type of fuel being consumed, a common energy unit shall be utilised. (e.g., MWh, MJ)

4. The energy unit of fuels shall be computed by multiplying the calorific value (e.g., J/kg, kJ/l) of the fuel with the quantity (e.g., kg, l). Refer to the Appendix for the list of common calorific value that can be used as reference. In the event of fuels not listed in the Appendix, the assessor shall request from the organisation for such information accompanied by respective reference document (e.g., certificates of analysis for fuel calorific value, literature reference).

5. Other documents that can be used as evidence are purchase invoices received by utility providers or suppliers for fuel purchased with the assumption that the energy purchased is consumed within the reporting period.

Fuel consumption coming from renewable sources:

1. Bills of quantities of fuel for fuels coming from renewable purchased shall be used to represent consumption of renewable fuel over a period of time. The total renewable fuel consumed shall be computed by taking the total quantities for the period of the reporting year. In the event that more than one renewable fuel source is consumed, the sum of the quantities of fuel consumed shall be considered.

2. Other forms of evidence acceptable include, purchase invoices, bill of lading, and other similar documents. Documents and records of renewable fuels consumed (e.g., biomass, biogas) can also serve as evidence.

3. If there are more than one type of renewable fuel being consumed, a common energy unit shall be utilised. (e.g., MWh, MJ)

4. The energy unit of renewable fuels shall be computed by multiplying the calorific value (e.g., J/kg, kJ/l) of the fuel with the quantity (e.g., kg, l). Refer to the Appendix for the list of common calorific value that be used as reference. In the event of fuels not listed in the Appendix, the assessor shall request from the organisation for such information accompanied by respective reference document (e.g., certificates of analysis for fuel calorific value, literature reference).

5. Other documents that can be used as evidence are purchase invoices received by utility providers or suppliers for fuel purchased with the assumption that the energy purchased is consumed within the reporting period.

Observations: Observations are made during the site visit to understand the actual case scenario of the green initiative implementation within the boundaries of the organisation.

Interviews: Interviews with respondent carried out to acquire insight of the processes/activities involved within the boundaries of the organisation.

Questionnaires/surveys: A set of questions designed for respondent to acquire insight of the processes/activities involved within the boundaries of the organisation.

Documents reviews: Documents reviewed during the site visit to support the observation.

3.3. COMPUTATION

The renewable energy percentage and renewable fuel percentage for the reporting period can be calculated using the following equations:

Percentage (%) of renewable energy consumption =

$$\frac{\text{Energy consumption coming from RE sources (i. e. , kWh, kJ, MMBTU)}}{\text{Total energy consumption (i. e. , kWh, kJ, MMBTU)}} \times 100\%$$

Percentage (%) of renewable fuel consumption =

$$\frac{\text{Fuel consumption coming from renewable sources (unit for fuel)}}{\text{Total fuel consumption (unit for fuel)}} \times 100\%$$

3.4. ASSUMPTIONS AND UNCERTAINTIES

Wherever fuel characteristic information is used for calculations, it shall be noted that the averaging of such characteristics (i.e., calorific value) contributes to uncertainties.

Any and all averaging approach to consumption data shall be noted and wherever practicably possible the uncertainties shall be quantified.

Total energy consumed for the reporting period shall be calculated based on the actual consumption of energy for each month within the reporting period. In the event of data unavailability, average consumptions can be provided. Averaging approaches and assumptions made should be described in sufficient detail.

Total fuel consumed for the year of reporting shall be calculated based on the actual consumption of fuel for each month within the reporting period. Each type of fuel should be calculated separately.

Suggested unit for fuel as follows:

Liquid fuel (i.e., petrol, diesel, oil, etc.) - litres of fuel

Solid fuel (i.e., coal, woodchip, etc) - kg of fuel

Gaseous fuel (i.e., natural gas, LPG, etc.) – MMBTU or cu.ft of gases

If the organisation is reporting both renewable electricity and renewable fuels, the energy units should be standardised in MWh or MJ and reported in combination.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

There are no limitations to this indicator.

4.2. VALIDATION

Renewable Energy Certificate (REC) issued by Tenaga Nasional Berhad (TNB) or GSPARX Sdn. Bhd. to validate total amount of renewable energy subscribed.

4.3. QUALITY MANAGEMENT

Not applicable.

5. REFERENCES

1. National Energy Efficiency Action Plan 2016 – 2025

2. Malaysia Renewable Energy Roadmap (MyRER)

3. Dasar Tenaga Negara (DTN) 2022 – 2040

4. The Sustainable Development Goals (SDGs)

INDICATOR: INNOVATION

SUB-INDICATOR: KNOWLEDGE TRANSFER AND COLLABORATION

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Establishment of strategic partnership/collaboration/JV/ knowledge transfer programme for innovation in green practices and commercialisation initiatives.

Sustainable Development Goal 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

Sustainable Development Goal 9: Build resilient infrastructure, promote sustainable industrialisation, and foster innovation.

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns.

Green Technology Master Plan (GTMP) 2017 – 2030 Strategic Thrust

ST2: Market Enablers

8.3.6 Introducing Roll-Out Plans Comprising Human Capital Development and Public - Private Collaboration to Green the Cities

8.3.7 International Collaborations

ST3: Human Capital Development

8.4.2 Greater Collaboration with Tertiary Institutions for Upskilling of Graduates

Dasar Sains, Teknologi, Inovasi Negara (DSTIN) 2021 – 2030

ST1: Advancing Scientific and Social Research Development and Commercialisation

1. Increase Gross Expenditure on R&D (GERD) to at least 2.0% of GDP by 2020

2. Enhance the performance of public and private Research, Development & Commercialisation funding

1.2. INDICATOR

Innovation

1.3. SUB-INDICATOR

Knowledge transfer and collaboration

1.4. LAST UPDATE

13 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITION

Knowledge transfer: Method of sharing information, abilities, ideas, discoveries, and skills across different areas/community that encourages innovation and boost efficiency in the organisation system. The activity involves research, academic engagement for technology transfer or commercialisation through the relationship between collaborative partners, with outcomes of successful knowledge or technology transfer and commercialisation.

Strategic collaboration: Strategic actions or programs in innovation practice to achieve specific goals and objectives of mutual benefit to the parties involved, creating values for intended audience/clients/consumers/stakeholders.

2.2. UNIT OF MEASURE

Not applicable

3 DATA SOURCE AND DATA COLLECTION METHOD

3.1 DATA SOURCES

Contract agreements: Documents indicating mutual obligations between two or more parties such as Letter of Intent (LOI)/Non-Disclosure Agreement (NDA)/Memorandum of Understanding (MOU)/Memorandum of Agreement (MOA).

Intellectual Property (IP): Documents related to intellectual protection such as copyrights, trademarks, trade secret, industrial design, utility innovation or patent.

Proof of Return on Value:

Economic Value: Financial accounting report indicating outlining investment, revenue and net profit based on commercialisation/ marketing attribution success of innovative green products/ services.

Social Value: Project completion report with evidence of applied/ implemented/reviewed innovation practices which leads to pre-set goals that are measurable improvements on existing practices of identified community.

Other related Value: Project report or document information improvement on productivity/practice/System and resource and material-efficiency leading to improved air and water quality/fewer waste/more renewable energy sources and other sustainable conditions.

3.2 DATA COLLECTION METHOD

Contract agreements

Evidence indicating a formal contract or agreement within collaborative parties:

1. Letter of Intent (LOI)/Non-Disclosure Agreement (NDA)/ Memorandum of Understanding (MOU)/Memorandum of Agreement (MOA).

Intellectual Property (IP)

1. Provisional IP application document or;

2. E-Filling document or;

3. Published detailed of invention or;

4. IP Award certificate/letter or;

5. IP filing number

Organisation may present proof of Economic ROI and/or Social Value ROI

Proof of Return on Investment (ROI) or Return on Value (ROV):

Proof of Economic ROI

1. Financial accounting report of commercialised product/ service solution resulting from innovation project. (e.g., commercial activities, transactions, order, invoice)

2. Proof of positive return on investment (ROI) is not necessary. However, organisation will only need to proof that commercialised product/service is going to or actively being promoted to market.

Proof of Social Value ROI

1. Project completion report (clearly shows measurable pre-set goals to improve existing practices related to community engagement outlining innovation product/service/process applied/implemented/system/management/productivity reviewed on identified community).

2. In the event of an ongoing project, proof of actual goals is not yet necessary. However, proof plan or ongoing engagement with community must be present through official project documents.

Proof of Other ROV

1. Project completion report with evidence of improvement on productivity/practice/System and resource and material-efficiency leading to improved air and water quality/fewer waste/more renewable energy sources and other sustainable conditions.

3.3 COMPUTATION

Not applicable

3.4 ASSUMPTIONS AND UNCERTAINTIES

Not applicable

4 OTHER METHODOLOGICAL CONSIDERATIONS

4.1 COMMENT AND LIMITATION

Not applicable

4.2 VALIDATION

Not applicable

4.3 QUALITY MANAGEMENT

1. Malaysian Standards (MS) - Standards Malaysia

2. Local or International Product Certification – SIRIM

3. Good Design Mark – Malaysia Design Council

4. MyHIJAU Mark - MGTC

5.0 REFERENCES

1. Green Practice Guideline for Services Sector (Final Report Draft 2022)

2. Green Technology Master Plan Malaysia/GTMP (2017 – 2030)

3. Dasar Sains, Teknologi dan Inovasi Negara/DSTIN (2021 – 2030)

4. Dasar Keusahawanan Negara/DKN (2030)

5. Sustainable Development Goals (SDG) 2030

6. Dasar Perubahan Iklim Negara

INDICATOR INSTRUMENT FACTSHEET

INDICATOR: INNOVATION

SUB-INDICATOR: RESEARCH AND DEVELOPMENT (R&D)

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal 1: Establishment of Research & Development (R&D) process, output, and policy for organisation.

Goal 2: To increase investment or incentive received to support innovation in green practice to promote commercialisation, Intellectual Property and award/recognition within the organisation.

Sustainable Development Goal 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

Sustainable Development Goal 9: Build resilient infrastructure, promote sustainable industrialisation, and foster innovation

Sustainable Development Goal 12: Ensure sustainable consumption and production patterns

Green Technology Master Plan (GTMP) 2017 – 2030 Strategic Thrust

ST4: Research & Development & Commercialisation (R&D&C)

8.5.1   A key steppingstone towards an innovative Green Technology (GT) hub

8.5.1.1   R&D&C Projects

8.5.2   Encouraging more localised and demand driven R&D&C

ST2: Market Enablers

8.3.2   Funding GT project development

8.3.3   Exploring Alternative GT Financing Ecosystem

8.3.4   GT Incentives

Dasar Sains, Teknologi, Inovasi Negara (DSTIN) 2021 – 2030

ST1: Advancing Scientific and Social Research Development and Commercialisation

1. Enhance commercialisation and increase uptake of home-grown R&D innovative products through clear guidelines and standards compliance

2. Increase Gross Expenditure on R&D (GERD) to at least 2.0% of GDP by 2020

1.2. INDICATOR

Innovation

1.3. SUB-INDICATOR

Research and Development (R&D)

1.4. LAST UPDATE

13 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1 DEFINITIONS

Research & Development (R&D): Activities that organisation undertakes to innovate and introduce new improvised products and services.

Commercialisation: The process of bringing new products and services to market.

Innovation: Innovation refers to activity that contribute to the creation of key products, services, or processes to reduce the harm, impact, and deterioration of the environment while optimising the use of natural resources.

Products: Product innovation involves creating new products or improved versions of existing products that increase their uses or impact in green solution/environment. It applies the concept of green to the entire process of product innovation by increasing resource utilisation, efficiently promoting green production design, and positively promoting corporate financial performance.

Services: Green service innovation includes elements such as green invention, environmental service portfolio, environmental service delivery, and environmental service design. Distinct from other service innovations, green service innovation focuses on environmental social responsibility and customer experience.

Intellectual Property: Form of property that includes any tangible/ intangible creations of human intellect, green practices, or green innovation initiatives. Namely patents, copyrights, industrial design, utility innovation, trademarks, and trade secrets.

Social innovations: New solutions (products/services/models/ markets/processes) that simultaneously meet a social need and lead to new or improved capabilities and relationships and better use of assets and resources.

2.2 UNIT OF MEASURE

Not applicable

3. DATA SOURCE AND DATA COLLECTION METHOD

3.1 DATA SOURCES

Innovation Management Procedure: Sets of policies, processes and procedures used by organisations to ensure fulfilment of tasks required to achieve operational objective for innovation (including financial success, safe operation, product quality, client relationships, legislative and regulatory conformance, and worker management).

Organisational Structure: Refers to systems which outlines how innovation activities are formalised through functions within an R&D unit and within the boundaries of the organisations under evaluation.

*Product/Design/System/Solution Blueprint/*Refers to related standard documents/record/proof of concept and pertaining innovation outcome.

Project Charter: A document that describes an innovation project in its entirety. (Overview, an outline of scope, an approximate schedule, a budget estimate, anticipated risks, and key stakeholders.

Grant Proposal: A document proposing a research project requesting for sponsorship of that research.

Grant Award Document: A written agreement between the organisation and a grantee as the official notification of grant approval with evidence for contractual grant reporting.

Investment Records: Financial documents/records used as evidence for internal and external investment of technology or system which enables innovation process/research/practice/ development in the organisation.

Intellectual Property (IP): Provisional IP application document/ E-Filling document/published detailed of invention on intellectual protection within copyright, trademark, patents, geographical indications, plant varieties, industrial designs and semiconductor integrated circuit layout designs.

Recognition/Award/Certification: Refers to the state or quality innovation product/process/service that are recognised or acknowledged by certified bodies.

Proof of Return on Value:

Economic Value: Financial accounting report indicating outlining investment, revenue and net profit based on commercialisation/ marketing attribution success of innovative green products/ services.

Social Value: Project completion report with evidence of applied/ implemented/reviewed innovation practices which leads to pre-set goals that are measurable improvements on existing practices of identified community.

Other related Value: Improvement on productivity/practice/ System and resource and material-efficiency leading to improved air and water quality/fewer waste/more renewable energy sources and other sustainable conditions.

3.2 DATA COLLECTION METHOD

The data to be collected should prove the existence of a Research and Development (R&D) unit/dept/personnel with proof of project document and R&D result that includes any one of the suggested types of evidence.

Proof of in-House R&D Process (any of the following):

Existence of R&D unit/dept/personnel/appointment

1. A unit or section or department that has a role on promoting innovation (e.g: R&D department, testing department, incubation unit) or;

2. Appointment letter or minute meeting indicating specific Person in Charge for a R&D project related to green practices.

3. Position or job title in charge in R&D, testing or innovation (e.g: Project manager, Research Supervisor,) or;

4. A project or an activity promoting innovation in management procedure within the reporting period. (e.g: new product development, Innovation Competition, Design improvement, product or service refinement) or;

5. In the event of unit or section specifically promoting innovation is not present, a specific team that work on innovation project can be considered as evidence of innovation management system in place.

Product/Design/System/Solution Blueprint

1. Evidence illustrates the outcome from R&D, Commercialisation, or Innovation (eg: Technical Drawing, System Drawing or chart, Layout, Product blueprint, Prototype, Model Making, Mock-ups, Proof of Concept Development).

2. A proof of service system (eg: System Flowchart, Apps, Software Development).

Project Charter: Project Plan and Proposal or Project Roadmap outlining the overview of project, scope, schedule, estimated budget.

Proof of Research & Development Investment (any of the following):

Grant Proposal:

1. Proof of submitted grant proposal outlining context, objectives, and methods leading to research and development project for innovation activities/product/services/process. or;

2. Grant proposal draft that will be submitted within the year of reporting period. (With proof of call for submission poster/ email/letter)

Grant Award Document:

1. Grant agreement for research and development project – active grant. (eg: Grant letter, Contract agreement, grant certificate, Proof of grant/financial) or;

2. Grant payment (eg: Proof of grant/financial record or transaction) or;

3. Grant Monitoring records (eg: Project progress report, financial statements)

Investment Records:

1. Financial documents/records used as evidence for internal and external investment of technology or system which enables innovation process/research/practice/development in the organisation.

2. A written agreement between the organisations as the official notification of grant/fund/sum value invested with evidence for contractual investment reporting.

Internal/external investment of innovation-enabling technology or system:

1. Agreement, subscription, assignment, or other document evidencing in physical form an investment appointing the organisation as custodian.

2. Purchase or installation record of system or technology.

Proof of Research & Development Outcome/Project Report (any of the following):

Proof of Return on Investment (ROI) or Return on Value (ROV):

Proof of Economic ROI

1. Financial accounting report of commercialised product/service solution as a result of innovation project. (e.g commercial activities, transactions, order, invoice)

2. Proof of positive return on investment (ROI) is not necessary, organisation will only need to proof that commercialised product/service is going to or actively being promoted to market.

Proof of Social Value ROI

1. Project completion report (clearly shows measurable pre-set goals to improve existing practices related to community engagement outlining innovation product/service/process applied/implemented/system/management/productivity reviewed on identified community).

2. In the event of an ongoing project, proof of actual goals is not yet necessary. However, proof plan or ongoing engagement with community must be present through official project documents.

Proof of Other ROV: Project completion report with evidence of improvement on productivity/practice/System and resource and material-efficiency leading to improved air and water quality/fewer waste/more renewable energy sources and other sustainable conditions.

Intellectual Property (IP):

1. Provisional IP application document/E-Filling document/published detailed of invention on intellectual protection within copyright, trademark, patents, geographical indications, plant varieties, industrial designs and semiconductor integrated circuit layout designs.

2. E-Filling document or;

3. Published detailed of invention or;

4. IP Award certificate/letter or;

5. IP filling number.

Recognition/Award/Certification:

1. Recognition of achievement, label, standards or special acknowledgment on Innovative solution, product or services. (eg: MyHIJAU mark, Eco-label mark, MS mark, or significant recognition promoting innovation).

2. Certificate for Research & Development outcome from local or international agencies, association, government bodies and authorities (eg: Product Certification from SIRIM, Standards Malaysia, MGTC, MRM or MyIPO).

3. Proof of award received from R&D&C&I initiative, projects, programs, or venture. (eg: Local or International recognised award/organiser/provider).

3.3 COMPUTATION

Not applicable

3.4 ASSUMPTIONS AND UNCERTAINTIES

Not applicable

4.0 OTHER METHODOLOGICAL CONSIDERATIONS

Not applicable

4.1 COMMENT AND LIMITATION

Not applicable

4.2 VALIDATION

Not applicable

4.3 QUALITY MANAGEMENT

- Malaysian Standards (MS) – Standards Malaysia
- Local or International Product Certification – SIRIM
- Good Design Mark – Malaysia Design Council
- MyHIJAU Mark – MGTC

5.0 REFERENCES

1. Green Practice Guideline for Services Sector (Final Report Draft 2022)

2. Green Technology Master Plan Malaysia/GTMP (2017 – 2030)

3. Dasar Sains, Teknologi dan Inovasi Negara/DSTIN (2021 – 2030)

4. Sustainable Development Goals (SDG) 2030

5. Dasar Keusahawanan Negara/DKN (2030)

INDICATOR INSTRUMENT FACTSHEET

INDICATOR: MANAGEMENT

SUB-INDICATOR: GREEN PROCUREMENT

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal: Encourage companies to adopt sustainable practices and integrate sustainability information into their reporting cycle.

This goal is mapped to SDG #12 - Sustainable consumption and production, specifically addressing target #12.6 - Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (Sustainable target reporting in companies).

1.2. INDICATOR

Management

1.3. SUB-INDICATOR

Green Procurement

1.4. LAST UPDATE

13 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITIONS

Boundary: A defined border that accounts for and limits the key business activities and processes which form the basis of the study or analysis.

Baseline year: A reference point in time against which a measure of consumption and/or production in the present and/or future are measured.

Reporting period: The period for which the instrument assesses the organisation. Unless required, otherwise period should be one year.

Management: Management from an organisational perspective refers to planning, organising, and administering its resources and activities effectively to achieve specific objectives efficiently.

Green Procurement: The acquisition of environmentally friendly products and services, including setting environmental requirements in selecting suppliers, contractors, and contract agreements.

2.2. CONCEPTS

Not applicable.

2.3. UNIT OF MEASURE

Not applicable.

3. METHODOLOGY

3.1. DATA SOURCES

Policy or standards: Refers to a written policy and/or international/national standards used/implemented within the organisation's boundaries.

Monitoring records: Refers to documents/records used as evidence and primary data to achieve the intended goals.

Contract agreements: Documents are evidence for indicating mutual obligations between the parties.

Purchasing records and documents: Documents indicate the organisation acquiring services or/and products/systems.

3.2. DATA COLLECTION METHOD

Policy or standards:

1. A green procurement written document that states services or/and products/systems.

2. A description of company guidelines related to services or/and products/systems.

3. Strategic action plan document of a company on green procurement commitments.

4. Green procurement policy document related to the organisation's services or/and products/systems.

Monitoring Records:

1. A statement of green practices activities related to green procurement that are shared in minutes of meetings, mission & vision, website, social media, and others.

2. Recognition of certificate and award on green procurement activities in national and international organisations.

Contract agreements: A documented agreement on green procurement related to services or/and products/systems (LoI/MoU/MoA).

3.3. ASSUMPTION AND UNCERTAINTIES

Not applicable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

Not applicable.

4.2. VALIDATION

Any nationally and internationally recognised eco-label certification.

4.3. QUALITY MANAGEMENT

ISO 20400:2017 (Green Procurement)

5. REFERENCES AND DOCUMENTATION

1. Sustainable Development Goals (SDG) 2030.

2. ISO 20400:2017 Guideline

INDICATOR: MANAGEMENT

SUB-INDICATOR: POLICY AND PROGRAMME

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal: Encourage small, medium, and large companies to adopt sustainable practices and reporting.

This goal is aligned with the Sustainable Development Goals (SDGs) created by the United Nations in its 2030 Agenda. Sustainable Development #12.6 focuses on small, medium, and large companies adopting sustainable practices by integrating sustainable information into their reporting cycle. This goal is crucial to ensure that the pattern of Consumption and Production should be sustainable as the key to sustaining the livelihoods of current and future generations.

1.2. INDICATOR

Management

1.3. SUB-INDICATOR

Policy and Programme

1.4. LAST UPDATE

13 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITIONS

Boundary: A defined border that accounts for and limits the key business activities and processes which form the basis of the study or analysis.

Baseline year: A reference point in time against which a measure of consumption and/or production in the present and/or future are measured.

Reporting period: The period for which the instrument assesses the organisation. Unless required, otherwise time span should be one year.

Management: Management from an organisational perspective refers to planning, organising, and administering resources and activities effectively to achieve specific objectives efficiently.

Policy: Documented statement to achieve specific goals by the organisations.

Programme: An activity that supports the achievement of the stated goal. The results of the project activities must have a direct, real, and measurable impact on achieving the intended purpose

2.2. CONCEPTS

Not applicable.

2.3. UNIT OF MEASURE

Not applicable.

3. METHODOLOGY

3.1. DATA SOURCES

Policy or standards: Refers to a written policy and/or international/ national standards used/implemented within the organisation's boundaries.

Monitoring records: Refers to documents/records used as evidence and primary data to achieve the intended goals.

Contract agreements: Documents are evidence for indicating mutual obligations between the parties.

3.2. DATA COLLECTION METHOD

Policy or standards:

1. Policy or standards comply with local, national, and international legislation and regulations (e.g., Environmental Quality Act 1974).

2. Policy or standards of green practice by the organisation (e.g., ISO standards).

3. Developed guidelines or standard operating procedures of any green practice by the organisation (e.g., MyHIJAU Guidelines).

4. A planned roadmap and implemented strategy of new green practices (e.g., National Green Growth Roadmap).

Monitoring Records:

1. Reports of participation in any sustainability programs on the website, social media, posters, and minutes of meetings.

2. Recognition of certificate and award received on sustainability programs at national and international levels.

Contract agreements:

1. A written agreement of green practices commitment among employees and top management (e.g., Vision and missions of organisation).

2. A written agreement of green practices commitment with industries (e.g., MOU/MOA/LOI/LOA/NDA).

3. A written agreement of green practices commitment for corporate social responsibility (CSR) (e.g., Community).

3.3. ASSUMPTION AND UNCERTAINTIES

Not applicable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1. COMMENT AND LIMITATION

Not applicable.

4.2. VALIDATION

Not applicable.

4.3. QUALITY MANAGEMENT

ISO 9001:2015 (Quality Management Systems)
ISO 14001:2015 (Environmental Management System)
ISO 45001:2018 (OSHA)

5. REFERENCES

1. Sustainable Development Goals (SDG) 2030.

2. ISO 9001:2015 Guideline

3. ISO 14001:2015 Guideline

4. ISO 45001:2018 Guideline

INDICATOR: MANAGEMENT

SUB-INDICATOR: HUMAN CAPITAL

1. INDICATOR INFORMATION

1.1. GOALS AND TARGETS

Goal: Encourage companies to adopt sustainable practices and integrate sustainability information into their reporting cycle.

This goal is mapped to SDG #12 - Sustainable consumption and production, specifically addressing target #12.6 - Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle (Sustainable target reporting in companies).

1.2. INDICATOR

Management

1.3. SUB-INDICATOR

Human Capital

1.4. LAST UPDATE

3 May 2023

1.5. RELATED SECTORS

This indicator instrument applies to the following sectors:

- Agriculture & Plantation
- Aquaculture
- Construction
- Forest operation
- Livestock
- Manufacturing
- Mining
- Services

2. DEFINITIONS AND CONCEPTS

2.1. DEFINITIONS

Boundary: A defined border that accounts for and limits the key business activities and processes which form the basis of the study or analysis.

Baseline year: A reference point in time against which a measure of consumption and/or production in the present and/or future are measured.

Reporting period: The period for which the instrument assesses the organisation. Unless required, otherwise period should be one year.

Human Capital: A productive wealth embodied in labour, skills, and knowledge that can be developed, recruited, trained, and managed to achieve organisational goals.

2.2. UNIT OF MEASURE

Not applicable.

3. METHODOLOGY

3.1. DATA SOURCES

Policy or standards: Refers to a written policy and/or international/ national standards used/implemented within the boundaries/ organisations.

Monitoring records: Refers to documents/records used as evidence and primary data to achieve the intended goals.

Contract agreements: Documents are evidence for indicating mutual obligations between the parties.

Purchasing records and documents: Documents indicate the organisation acquiring services or/or products/systems.

3.2. DATA COLLECTION METHOD

Policy or standard:

1. Human capital development document that stated key performance indicators related to green practices.

2. A strategic action plan on human capital development that the organisation undertakes to meet its green practices.

3. Policy on human capital development related to green practices applied in the organisation.

Monitoring Records:

1. Minutes of meetings related to human capital development.

2. A statement of documented human capital development that the organisation shares on its website, social media, and other media of communications.

3. Recognition of organisational human capital development activities (e.g., certificate, award at national and international levels).

Contract agreements: A documented agreement indicating mutual obligations between the parties that is related to human capital development.

3.3 ASSUMPTIONS AND UNCERTAINTIES

Not applicable.

4. OTHER METHODOLOGICAL CONSIDERATIONS

4.1 COMMENT AND LIMITATION.

Not applicable.

4.2. VALIDATION

Not applicable.

4.3. QUALITY MANAGEMENT

ISO 30414:2018 (Human Resource Management)

5. REFERENCES AND DOCUMENTATION

1. Sustainable Development Goals (SDG) 2030.

2. ISO 30414:2018 Guide

QUESTIONNAIRE

1. Cost-benefit analysis: This involves comparing the costs of implementing the evaluation method with the potential benefits that it is expected to produce.

   (a) On a scale of 1-5, how expensive is it to implement this evaluation method?
   (1 = very inexpensive, 5 = very expensive)

   (b) On a scale of 1-5, how much of a benefit is this evaluation method expected to produce?
   (1 = no benefit, 5 = significant benefit)

   (c) On a scale of 1-5, how likely is it that the benefits of this evaluation method will outweigh the costs?
   (1 = not likely at all, 5 = extremely likely)

   (d) On a scale of 1-5, how confident are you that the costs of this evaluation method can be financed?
   (1 = not confident at all, 5 = extremely confident)

   (e) On a scale of 1-5, how well does this evaluation method compare to other evaluation methods in terms of cost-benefit ratio?
   (1 = much worse, 5 = much better)

   (f) On a scale of 1-5, how much of an impact does this evaluation method have in terms of unintended consequences?
   (1 = no impact, 5 = significant impact)

   (g) On a scale of 1-5, how much of an impact does this evaluation method have in terms of long-term costs or benefits?
   (1 = no impact, 5 = significant impact)

   (h) On a scale of 1-5, how much of an impact does this evaluation method have in terms of regulatory or legal considerations?
   (1 = no impact, 5 = significant impact)

2. Feasibility study: This is a comprehensive analysis of the potential risks, challenges and opportunities of the evaluation method, including the resources required and the potential impact on the stakeholders.

   (a) On a scale of 1-5, how easy is it to implement this evaluation method?
   (1 = very difficult, 5 = very easy)

   (b) On a scale of 1-5, how well does this evaluation method fit within the available resources and constraints?
   (1 = not well at all, 5 = extremely well)

   (c) On a scale of 1-5, how likely is it that this evaluation method will be successful given the available resources and constraints?
   (1 = not likely at all, 5 = extremely likely)

   (d) On a scale of 1-5, how much time is required to implement this evaluation method?
   (1 = very little time, 5 = a significant amount of time)

   (e) On a scale of 1-5, how well does this evaluation method perform during the pilot testing?
   (1 = not well at all, 5 = extremely well)

   (f) On a scale of 1-5, how well does this evaluation method perform in terms of logistics?
   (1 = not well at all, 5 = extremely well)

   (g) On a scale of 1-5, how well does this evaluation method perform in terms of data accessibility?
   (1 = not well at all, 5 = extremely well)

   (h) On a scale of 1-5, how well does this evaluation method perform in terms of expert review?
   (1 = not well at all, 5 = extremely well)

3. Time analysis: This involves analysing the amount of time required to implement the evaluation method, including the time required for data collection, analysis, and reporting.

   (a) On a scale of 1-5, how much time is required to set up this evaluation method?
   (1 = very little time, 5 = a significant amount of time)

   (b) On a scale of 1-5, how much time is required for data collection with this evaluation method?
   (1 = very little time, 5 = a significant amount of time)

   (c) On a scale of 1-5, how much time is required for data analysis with this evaluation method?
   (1 = very little time, 5 = a significant amount of time)

   (d) On a scale of 1-5, how much time is required for reporting with this evaluation method?
   (1 = very little time, 5 = a significant amount of time)

   (e) On a scale of 1-5, how often does the data need to be updated with this evaluation method?
   (1 = rarely, 5 = frequently)

   (f) On a scale of 1-5, how much of an impact does this evaluation method have on staff time?
   (1 = no impact, 5 = significant impact)

   (g) On a scale of 1-5, how much of an impact does this evaluation method have on the project timeline?
   (1 = no impact, 5 = significant impact)

   (h) 8. On a scale of 1-5, how well does this evaluation method fit within the overall project schedule?
   (1 = not well at all, 5 = extremely well)

   (i) On a scale of 1-5, how much flexibility is there to adjust the timing of data collection and analysis with this evaluation method?
   (1 = very little flexibility, 5 = a lot of flexibility)

   (j) On a scale of 1-5, how much time is required for training personnel to use this evaluation method?
   (1 = very little time, 5 = a significant amount of time)

4. Pilot testing: This involves testing a small-scale version of the evaluation method to identify any potential issues or challenges that need to be addressed before full implementation.

   (a) On a scale of 1-5, how well did this evaluation method perform during the pilot test?
   (1 = not well at all, 5 = extremely well)

   (b) On a scale of 1-5, how well did the evaluation method meet the needs of the test participants?
   (1 = not well at all, 5 = extremely well)

   (c) On a scale of 1-5, how well did the evaluation method achieve the desired outcomes?
   (1 = not well at all, 5 = extremely well)

   (d) On a scale of 1-5, how much feedback did test participants provide about the evaluation method?
   (1 = very little feedback, 5 = a lot of feedback)

   (e) On a scale of 1-5, how well did the evaluation method perform compared to other similar methods tested?
   (1 = not well at all, 5 = extremely well)

   (f) On a scale of 1-5, how feasible is it to implement this evaluation method on a larger scale?
   (1 = not feasible at all, 5 = extremely feasible)

   (g) On a scale of 1-5, how much of an impact did the evaluation method have on the pilot test participants?
   (1 = no impact, 5 = significant impact)

   (h) On a scale of 1-5, how well did the evaluation method perform in terms of data accuracy?
   (1 = not well at all, 5 = extremely well)

   (i) On a scale of 1-5, how well did the evaluation method perform in terms of data reliability?
   (1 = not well at all, 5 = extremely well)

   (j) On a scale of 1-5, how well did the evaluation method perform in terms of data validity?
   (1 = not well at all, 5 = extremely well)

5. Expert review: This involves consulting with experts in the field to gain their perspective on the feasibility of the evaluation method, including any potential challenges and opportunities.

    (a) On a scale of 1-5, how well does this evaluation method align with current industry standards and best practices?
    (1 = not well at all, 5 = extremely well)

    (b) On a scale of 1-5, how well does this evaluation method address the research question or problem it is intended to solve?
    (1 = not well at all, 5 = extremely well)

    (c) On a scale of 1-5, how well does this evaluation method utilise appropriate methods and techniques?
    (1 = not well at all, 5 = extremely well)

    (d) On a scale of 1-5, how well does this evaluation method account for potential sources of bias?
    (1 = not well at all, 5 = extremely well)

    (e) On a scale of 1-5, how well does this evaluation method account for potential confounding variables?
    (1 = not well at all, 5 = extremely well)

    (f) On a scale of 1-5, how well does this evaluation method account for potential ethical concerns?
    (1 = not well at all, 5 = extremely well)

    (g) On a scale of 1-5, how well does this evaluation method account for potential limitations?
    (1 = not well at all, 5 = extremely well)

    (h) On a scale of 1-5, how well does this evaluation method account for potential uncertainties?
    (1 = not well at all, 5 = extremely well)

    (i) On a scale of 1-5, how well does this evaluation method account for potential generalisability?
    (1 , not well at all, 5 = extremely well)

    (j) On a scale of 1-5, how well does this evaluation method perform in terms of data quality?
    (1 = not well at all, 5 = extremely well)

6. Stakeholder analysis: This involves identifying and assessing the perspectives and needs of the stakeholders affected by the evaluation method, to understand the feasibility of the method in relation to their needs and concerns.

    (a) On a scale of 1-5, how important are the stakeholders in the success of this evaluation method?
    (1 = not important at all, 5 = extremely important)

    (b) On a scale of 1-5, how satisfied are stakeholders with this evaluation method?
    (1 = not satisfied at all, 5 = extremely satisfied)

    (c) On a scale of 1-5, how well does this evaluation method meet the needs of the stakeholders?
    (1 = not well at all, 5 = extremely well)

    (d) On a scale of 1-5, how much input did stakeholders have in the development of this evaluation method?
    (1 = no input, 5 = significant input)

    (e) On a scale of 1-5, how well does this evaluation method align with the goals and objectives of the stakeholders?
    (1 = not well at all, 5 = extremely well)

    (f) On a scale of 1-5, how well does this evaluation method account for potential stakeholder conflicts?
    (1 = not well at all, 5 = extremely well)

    (g) On a scale of 1-5, how well does this evaluation method account for potential stakeholder resistance?
    (1 = not well at all, 5 = extremely well)

    (h) On a scale of 1-5, how well does this evaluation method account for potential stakeholder power imbalances?
    (1 = not well at all, 5 = extremely well)

    (i) On a scale of 1-5, how well does this evaluation method consider the perspectives of diverse stakeholders?
    (1 = not well at all, 5 = extremely well)

    (j) On a scale of 1-5, how well does this evaluation method involve stakeholders in the implementation and monitoring process?
    (1 = not well at all, 5 = extremely well)

7. Logistics: This involves assessing the logistical aspects of the evaluation method, including the availability of necessary equipment, personnel, and facilities required to implement the evaluation method.

   (a) On a scale of 1-5, how well does this evaluation method fit within the existing infrastructure and resources?
   (1 = not well at all, 5 = extremely well)

   (b) On a scale of 1-5, how much additional infrastructure and resources are required for this evaluation method?
   (1 = no additional resources, 5 = significant additional resources)

   (c) On a scale of 1-5, how well does this evaluation method account for potential logistical challenges?
   (1 = not well at all, 5 = extremely well)

   (d) On a scale of 1-5, how well does this evaluation method account for potential geographical challenges?
   (1 = not well at all, 5 = extremely well)

   (e) On a scale of 1-5, how well does this evaluation method account for potential seasonal challenges?
   (1 = not well at all, 5 = extremely well)

   (f) On a scale of 1-5, how well does this evaluation method account for potential security challenges?
   (1 = not well at all, 5 = extremely well)

   (g) On a scale of 1-5, how well does this evaluation method account for potential scalability?
   (1 = not well at all, 5 = extremely well)

   (h) On a scale of 1-5, how well does this evaluation method account for potential sustainability?
   (1 = not well at all, 5 = extremely well)

   (i) On a scale of 1-5, how well does this evaluation method account for potential adaptability?
   (1 = not well at all, 5 = extremely well)

   (j) On a scale of 1-5, how well does this evaluation method account for potential data privacy?
   (1 = not well at all, 5 = extremely well)