Towards a Low Carbon Emissions Pathway

Industry Leadership for Climate Action - Report of Proceedings (2021 Roundtable Sessions)

CAN | ceo action network

CLIMATE GOVERNANCE MALAYSIA

Foreword

Datuk Tengku Muhammad Taufik

President and Group CEO of Petronas, and Chairman of the CEO Action Network (CAN)

The world that businesses operate in today is exceptionally dynamic and volatile. Collectively, we are witnessing unprecedented economic, environmental and social changes take place on a global scale, at an ever-accelerating pace. Among these is the paramount urgency and pressing need for us to respond to the now-undeniable issue of climate change, via a just and responsible transition.

Globally, businesses are now facing this call from all our stakeholders – investors, regulators, financiers, customers and employees. Businesses are not only expected to clearly articulate their climate ***ambitions***, but to demonstrate their commitment and ability to take decisive climate ***actions***, in support of the Paris Agreement and United Nations Sustainable Development Goals.

To this end, the CEO Action Network (CAN) was established as a closed-door peer-to-peer informal network of CEOs representing 56 leading businesses and more than 20 priority sectors in Malaysia. CAN focuses on sustainability advocacy, capacity building, action and performance. CAN and Climate Governance Malaysia (CGM) have jointly organized a series of roundtable engagements with key ministries within the government, structured as a platform to elevate conversation and discuss policies to strengthen our national climate ambition.

These discussions have served to strengthen public-private partnership towards formulating a coherent narrative and charting progressive policies that support a lower carbon emissions pathway for Malaysia. These policies will need to delicately balance economic, climate and energy concerns- while still ensuring the country's socio-economic wellbeing. Successfully navigating a just transition will require a "Whole of Society" and "All of Government" approach. Businesses can- and indeed must- play a critical role to transform the existing value chain and ecosystem, anchored on international standards and global best practices. Of equal importance is the government's support through progressive policies and forward-looking regulatory frameworks which will be crucial to advance this journey.

We hope that this report offers some insights that contribute to the efforts towards shaping an ecosystem that accelerates transition to a lower carbon economy, while enabling the Malaysian private sector to capture new green growth opportunities, strengthen business resilience and build long-term sustainability.

Foreword

Datin Seri Sunita Rajakumar

Chairman, Climate Governance Malaysia (CGM)

We are in the critical year for action: the climate emergency is real, evidenced by solid science. Scientists are unequivocal about the clear and present dangers that we face and the extent of immediate measures required.

This is the private sector mobilising

The CEO Action Network is an unprecedented mobilization of the private sector. Here we see 56 thought leaders determined to champion sustainability, not as a cause, but embedded into the DNA of corporate life, while integrating feedback from multiple stakeholders, earning their social license to operate.

At Climate Governance Malaysia, a thriving community of almost 5000 non-executive directors, working professionals and civil society are committed to understanding the necessary mitigation and adaptation measures, as well as the massive transition which is needed.

Simple and elegant solutions emerged from Round Table sessions

The Round Table sessions served as a form of crowdsourcing for climate solutions and we were gratified by the number of pragmatic approaches championed by serious sustainability practitioners. These solutions offer us the possibility to make significant improvements to our national climate resilience.

Malaysia can punch above its weight

Moving forward, we are enthused and in 2022, intend to widen and deepen this national discourse, by extending into states, cities and other economic sectors, welcoming youth leaders, community figures as well as any individual who feels strongly about climate governance and wants to be part of the conversation.

Malaysia because of our mega-biodiversity, has tremendous capacity to prove itself as being an impactful and effective steward of the natural world, balancing economic needs with those of society and environment.

Therefore it is incumbent on all of us to promote impactful pathways for ourselves and our children whilst sustaining our one and only precious planet.

Content

1 Report objectives

CEO Action Network (CAN) and Climate Governance Malaysia have come together to facilitate a robust discussion between all stakeholders (Whole of Government, All of Society approach)

About CEO Action Network (CAN)

CAN is a Malaysian closed-door peer-to-peer informal network of CEOs and Board members focused on sustainability advocacy, capacity building, action and performance.

CAN was created with the following purpose:

- Getting institutions to step up by sharing information on how each institution have and can perform their fair share of climate change work; and
- Support the government and demonstrate the broad-based support Malaysia corporates can do.

50+ CEOs, board members & Senior management

>20 Critical sectors represented

2 Working groups

About Climate Governance Malaysia (CGM)

Climate Governance Malaysia is the Malaysian chapter of the World Economic Forum's Climate Governance Initiative.

CGM is a network of non-executive directors who aim to acquire the practical skills needed as long-term stewards of the business to help steer our companies through an effective climate transition strategy, taking into account the need for financial stability, increased resilience and sustainability.

Aside from non-executive directors, other stakeholders are also welcome to join the conversations and events.

>90 Events

4,000+ Subscribers

This report summarises the industry's effort through several rounds of roundtable discussions and policy recommendations to the Government

Objective of this report

The **CEO Action Network** (CAN) and **Climate Governance Malaysia** (CGM) is appreciative of the role **Kementerian Alam Sekitar dan Air ("KASA")** has undertaken for being supportive of this report and providing the secretariat to organise the roundtables.

The goals and responses of KASA to date have been measured and cautious, but given the availability of scientific data, there is a short period of time to avert the worsening of climate conditions and to protect Malaysia. CAN would also like to extend their gratitude for the support of Datuk Tengku Muhammad Taufik, President and Group CEO of Petronas and Chairman of CAN.

This paper was initiated by CAN and CGM to provide government with feedback from the business community and civil societies. The approach was to undertake roundtables and discussion in order to elicit from industry leaders, NGOs and government agencies their thoughts on the challenges and what can be done.

This bottom up exercise is not meant to be holistic or comprehensive in nature but as a consideration for the Yang Amat Berhormat Prime Minister to take cognisance of corporate Malaysia's perspective on climate change, with involvement of stakeholders from the government, industry as well as the general public.

2 A Low Carbon Emissions Pathway for Malaysia

A historical background: Awareness on sustainability and climate change has prompted a global response to tackle the issue through policy and market solutions

1987 — Brundtland Report

Defines the concept of sustainable development

"..meeting the needs of the present without compromising the ability of future generations to meet their own needs..."

1994 — Triple Bottom Line, John Elkington

Companies should be preparing three different bottom lines of ***Profit, People, Planet***

1997 — Kyoto Protocol

Commits its country parties by setting non-binding emission reduction targets.

2015 — Paris Agreement

First ever universal legally binding global climate deal adopted by 195 countries. Strengthening global response to climate change by ***"pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels"***

- Malaysia set a target to reduce intensity of GHG emissions by 45% by 2030, 35% unconditionally and 10% conditional

2015 — Sustainable Development Goals (SDGs)

The UN 2030 Agenda sets out 17 goals, related to ESG, to be achieved until 2030.

2017 — Task Force on Climate related Financial Disclosures (TCFD)

Provides recommendations for transition (policy, technology, market) risks and physical risks associated with climate change across industries.

2019 — European Green Deal

New EU growth strategy with 4 objectives

- Climate neutrality by 2050
- Reduction of environmental pollution
- Global leadership in clean products and technologies
- Ensuring a fair and inclusive transition.

2021 — Carbon neutral Malaysia by 2050

Under the 12th Malaysia Plan, Malaysia has set an ambition to be a carbon neutral nation by 2050

- Malaysia upgraded its NDC target to reduce intensity of GHG emissions by 45% by 2030 unconditionally
- A net-zero emissions target by 2050 was tabled at COP26.

In the business as usual scenario for Malaysia, non-progressive action or even inaction towards climate action will mean failure to meet the Nationally Determined Contributions ("NDCs") as ratified by Malaysia during the Paris Agreement. In order to dramatically reduce emissions, Malaysia needs to protect carbon sinks and accelerate the replacement of fossil fuel-based energy generation with renewable energy and other alternative energy sources.

Business as usual: Malaysia would achieve its target to lower GHG intensity to GDP by 45% by 2030, but doubling the absolute GHG emissions

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Status quo: While Malaysia has outlined its intentions towards carbon neutrality, action has yet to accelerate

In the business as usual scenario for Malaysia, non-progressive action or even inaction towards climate action will mean failure to meet the Nationally Determined Contributions ("NDCs") as ratified by Malaysia during the Paris Agreement. In order to dramatically reduce emissions, Malaysia needs to protect carbon sinks and accelerate the replacement of fossil fuel-based energy generation with renewable energy, while reducing emissions across other sectors such as transport, industry and waste. Below is comparison between Malaysia and regional peers of different initiatives taken with respect to the Paris Agreement:

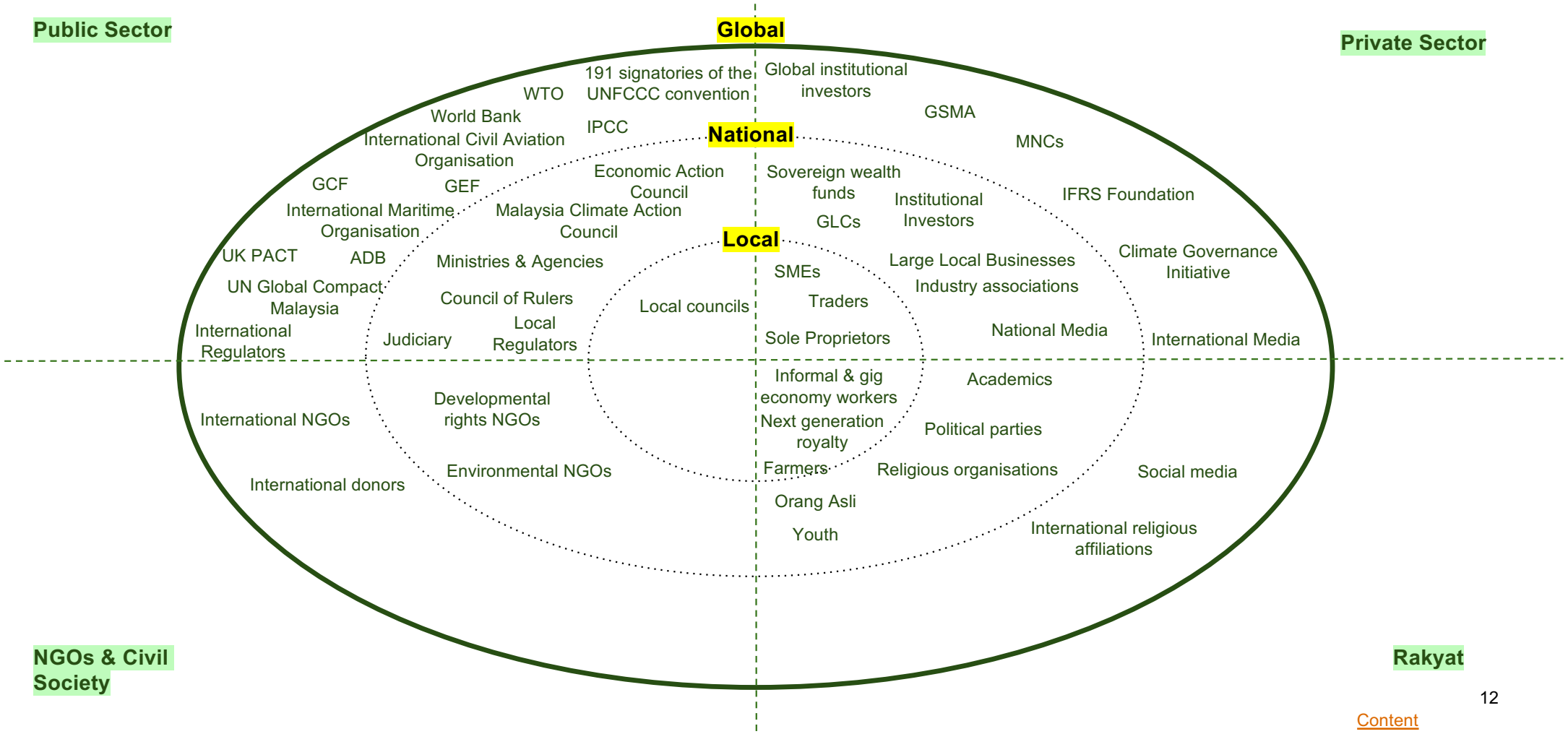
	Country	National Net Zero Target	Net-zero policy framework	ICE vehicle ban	Coal power phase-out	Carbon pricing	Mandatory TCFD reporting
ASEAN	Malaysia	Net-zero by 2050	None	None	Plans to phase out	Plans to introduce, with incentives in RE	None
ASEAN	Indonesia	By 2060	None	None	None	Developing	None
ASEAN	Singapore	By 2nd Half Century	None	By 2040	N/A	Carbon tax on large emitters only	None
Asia	South Korea	By 2050	2050 carbon neutral strategy	Diesel ban by 2025	Plans to phase out	Emission Trading Scheme	None
Global	United Kingdom	By 2050	Net-zero legislation by 2050	By 2030	By 2025	Carbon price floor	Compulsory
Global	United States	No later than 2050	None	Few states by 2030	Few states with moratorium	Few states with carbon price	None
Global	European Union	By 2050	Climate-neutral by 2050	Few member states by 2035	Few member states	Emissions Trading Scheme	None

Commitment Partial commitment / WIP No plans

Source: Climate Action Tracker, Climate Watch, World Bank, news articles

Content

Global, national and local stakeholders: Various stakeholders need to be engaged to get buy-in and act together towards climate action



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Consequences of inaction: There are various risks if Malaysia does not act to address climate issues

Environment and climate-related risks

Transition risks

- Policy and regulation
- Technology development
- Consumer preferences and behaviour

Physical risks

- Chronic (e.g.. temperature, precipitation, agricultural productivity, sea levels)
- Acute (e.g.. heatwaves, flood)

Adequacy of data

- Lack of accurate, timely data
- Inability to make informed decisions

Macro impact to the economy

- Productivity changes (from severe heat, diversion of investment to mitigation and adaptation)
- Loss in position of global supply chain
- Missed opportunities on funding and risk of downgrade in credit ratings
- Impact on international trade, investments and climate refugee
- Environmental pollution extended to carbon/ chemical emissions
- Reputation damage
- Intergenerational inequity

Micro impact to business and households

- Property damage and business disruption from severe weather
- Stranded assets and new capital expenditure due to transition
- Changing demand and costs
- Legal liability (from failure to mitigate or adapt)
- Loss of income (from weather disruption)
- Food security
- Declining public health
- Property damage (from severe weather)
- Socio economic changes (from changing consumption patterns, migration, conflict)

Implications of status quo

Reputation risks

- Downgrade in country's credit rating

Credit risks

- Defaults by businesses and households
- Collateral depreciation

Market risks

- Declining foreign and domestic direct investment

Operational risks

- Supply chain disruptions

Liquidity risks

- Reduced access to funding

Political risks

- Increased pressure amongst youth, activism

Legal risks

- Public officer immunity

Source: International Finance Corporation, CAN analysis

Implementation priorities: Actions are needed to address priorities across different stakeholder groups

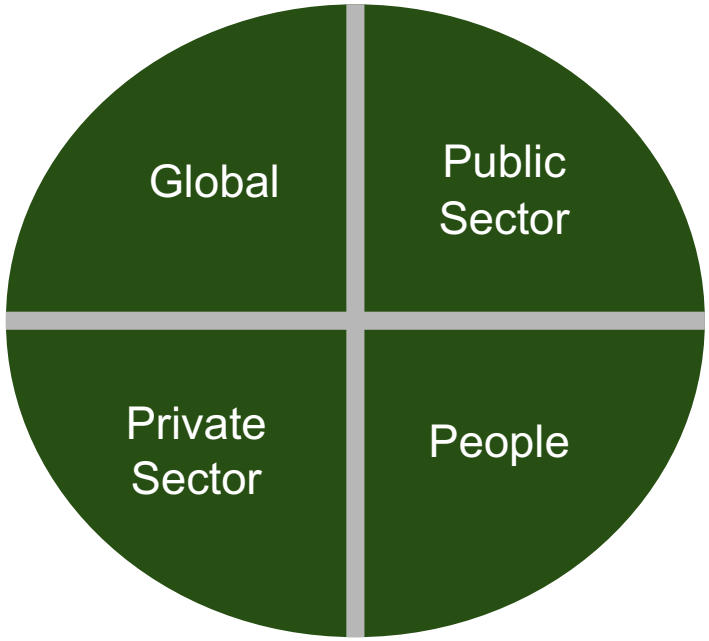
These broad thematic concerns have been raised across all industry roundtable sessions, highlighting areas which could benefit from increased attention and resources, while unlocking significant immediate value in the transition pathway.

Thought Leadership
- Political will to lead by example on climate action
- Institutional knowledge bank for policy matters with regards to carbon sinks and mega-biodiversity

Funding
- Insufficient funds for sustainability agenda and underutilisation of globally publicly available funds

Framework and legislation
- Absence of sustainability framework and standards

Financing
- Increased access to financing climate action



Data transparency
- Data secrecy between different sector and agencies
- Unverified and untimely data

Misaligned policies
- Conflicting policies
- Inconsistent objectives between federal and state

Socioeconomic challenges
- Relevant skills shortage

Structural
- High dependence on polluting sectors

3 All of government, Whole of society approach

The CEO Action Network (CAN) has set an ambitious target for its members towards sustainability

Collective commitments by 2023

	Level 1	Level 2	Level 3
GOVERNANCE	• Conduct **stakeholder engagement** and **disclose material issues** impacting stakeholders • Disclose material Environment, Economic, Social and Governance **milestones**	• Disclose material sustainability **risks** and **opportunities** • Disclose **performance criteria** of **top management** linked to ESG	• Disclose and set public targets on how the organisation contributes to **achieving the 2030 UN Sustainable Development Goals**
ENVIRONMENT	• Measure and disclose **GHG Scope 1 & 2** emissions for main operations	• Set **public targets** on GHG Scope 1 & 2 • Commit to **implement TCFD recommendations**	• **Achieve Net Zero by 2050**, and commit to develop and **publish a progressive roadmap by 2023**, if not sooner
PEOPLE	• Measure and disclose percentage of **female composition in top management** • Commit to safeguarding and **enhancing employee well-being** including physical, mental well-being	• Set **public targets** on percentage of female composition in top management • Conduct **human rights risk assessment**, across own operations and value chain	• Adopt the **"United Nations Guiding Principles on Business and Human Rights"** within the organisation and also to support the adoption of the UNGPs throughout the value chain

More than 4,000 attendees participated across 14 roundtable sessions to generate discussions among different stakeholder groups

CAN Malaysia Achieve Net Carbon Neutral by 2050?

As an initiative to meet our commitments, a series of roundtable sessions were conducted for 5 months between April to September 2021, designed to solicit feedback on the viability of a national net zero emissions target for Malaysia.

The roundtables were driven by the private sector with involvement of government officials and non-governmental organisations (NGOs). It was free to access for the general public, with the content shared openly after the sessions.

The roundtable sessions were designed with the following features:

- Inclusive (All-of-Government, Whole-of-Society), free and open to the public.
- Entirely volunteer driven to reduce vested interests.
- Includes capacity building for all levels of awareness.
- Building institutional memory.
- Respectful dialogue.
- Content is retrievable with access to time-tagged video, blog posts, speeches, presentation decks and written responses to questions asked.
- Ground-level practical & easily implemented solutions towards mitigation and adaptation needs.

14 Roundtable sessions | **4,112** Attendees | **50** Speakers | **4** Industry sectors

Open data and government leadership were common themes discussed across the different sectors

High level findings

1 Importance of access to open and timely data

There is a common acknowledgement on the importance of data towards being able to provide evidence-based information related to policies and decisions. Further to this, the democratisation of access to critical data on a timely basis should be promoted, where open data approaches enables to make informed decisions.

- Relook at current legal frameworks surrounding data sharing amongst public sector ministries and agencies, private sectors and the public sector.
- Enables development of a dashboard to monitor climate risks - The National 4IR Policy advocates the use of technology for good - social, economic and environment.
- Tackle the lack of availability, cohesiveness and integration of policies and actions surrounding data.

2 Urgency for government to provide policy signals and to lead the way

Government needs to provide the right policy signals and to lead the way.

- Policy announcements to be followed through with transparent and coordinated implementation mechanism.
- Increase accountability to ensure the follow through mechanisms acts as a feedback loop with the participation of private sector.
- Rooftop solar to be mandated on all government (state and federal) buildings with a specific timeframe.
- Revisit the legal framework around provision of data to ensure accountability and transparency. This will increase public buy in on government's commitment to the cause.
- Increasing incentivisation to the private sector in terms of funding and tax benefits.

Business stewardship in their climate action and the value of natural capital were also common agenda items

High level findings

3 Businesses are ready to step up

Steps the private sector can take towards low carbon:

- Application of building efficiency certification for all new development.
- Prioritising energy efficiency.
- Increasing use of technology to support monitoring, reporting and verification.
- Increasing use of by-products (waste) for electricity generation.
- Zero tolerance and penalise sub-optimal systems e.g.. methane emissions in the plantations sector.
- Increasing the education to rakyat on progressive behavioural changes to be more energy efficient, leading to improved well-being.

4 Encourage behavioural changes

Climate change impact is becoming irreversible, and demand for natural resources exceeds the ecological regeneration capacity. Several mechanisms can be put in place to encourage behavioural changes:

- Urgent need to start pricing pollutants (carbon).
- Shadow pricing of ecosystem services (water, rivers, limestone).
- Increased accountability for use of natural resources, while incentivising best practices using market mechanisms such as lower tax rates.

Enhance use of natural assets and harmonise laws and regulations

High level findings

5 Enhance carbon sequestration

Carbon sequestration is the process of capturing and storing atmospheric carbon dioxide. Both private sectors and government can enhance this process by:

- Increase and enhance the role of Land use, land-use change, and forestry ("LULUCF").
- Enhance the use of certain natural assets that have be proven effective for carbon sequestration. For example, Malaysia has 641,886 ha of Mangroves (Shukor, AH, 2004) and studies have shown Mangroves store up to four times more carbon than most other tropical forests (Nature Geoscience, 2011).
- Increase public and private partnership in the research and use of carbon sequestration technology.

6 Harmonisation of laws and regulations

State and Federal governments can harmonise objectives and regulations to consistency in outcome and minimise blind spots:

- Create a single legislation in Malaysia that comprehensively addresses biodiversity conservation and management. Currently, there are inconsistent laws such as Protection of Wildlife Act 1972 and National Forestry Act 1982, all with specific and different objectives.
- Encourage state participation in biodiversity legislation since natural resources are within states jurisdiction and parliament's powers to make laws are subject to the distribution of powers & jurisdiction between federal & states.
- Empower monitoring agencies and ensure consistency and transparency in measurement of compliance.

4 Energy sector

Acknowledgement of Roundtable Participation

Energy Sector

This report has been prepared through engagement and consultation with the following ministries, agencies and associations.

Federal ministries

- Ministry of Environment and Water (KASA)
- Ministry of Transport (MOT)
- Ministry of Energy and Natural Resources (KeTSA)

Federal Agencies:

- Malaysia Green Technology and Climate Change Centre (MGTCCC)
- Energy Commission (EC)
- Sustainable Energy Development Authority (SEDA)
- Malaysia Automotive Robotics and IoT Institute (MARii)

Industry

- Petronas
- Shell
- Tenaga Nasional Berhad
- Boston Consulting Group
- Bursa Malaysia
- PwC Malaysia

Other bodies

- World Bank
- ISIS
- Sunway University
- Rimba

Malaysian Energy Sector to focus on ongoing challenges in balancing the energy trilemma of energy security, energy equity and environmental sustainability

The energy sector is estimated to account for 80% of Malaysia's greenhouse gas emissions and therefore plays a critical role in Malaysia's decarbonisation. Malaysia's Energy sector is highly regulated. The economic importance of Malaysia's sizeable oil and gas industry is an important factor to consider as the sector contributes to a large portion of government revenue and is a significant employer of human capital throughout the country as well as overseas. Subsidies for gas and fuel promote consumption at the detriment of efficiency measures. The influence of subsidies for gas and fuel in the energy and transport sector also plays a big role in the competitiveness of Malaysia's manufacturing sector with lower fuel costs compared to neighbouring countries.

17% RE share in the capacity mix 2021

40% Renewable energy target by 2035

Common themes emerged from the roundtable engagements, forming the basis of our sectoral recommendations:

1. Ready, long-term policies exist and should be implemented without delay in order to facilitate planning and investment by the private sector, e.g.. the Low Carbon Mobility Blueprint and National Energy Policy.
2. We are encouraged by RMK-12's emphasis on sustainability and green growth (Chapters 8 & 9 under Theme 3: Advancing Sustainability as well as integrated throughout the plan), and urge for focus now to be on swift and robust implementation.
3. The private sector is ready and able to support the government through investment and input to policy making, and can take leadership on key issues to demonstrate positive outcomes (e.g.. carbon capture and storage). We welcome public-private partnerships in an effort to resolve the energy trilemma.
4. Government must incentivise and facilitate low-carbon solutions and technologies through fiscal measures such as carbon pricing (and shadow pricing in the interim) and green financing.
5. Public and private sector can collaborate to facilitate open and transparent engagement at all levels and with the public to generate momentum for climate action – adoption of open data, the development of a public dashboard with key climate metrics and compulsory carbon reporting are key focus areas for collaboration.

Source: Energy Commission; World Integrated Trade Solution; National Academy of Sciences; Report on Peninsular Malaysia Generation Development Plan 2020 (2021-2039).

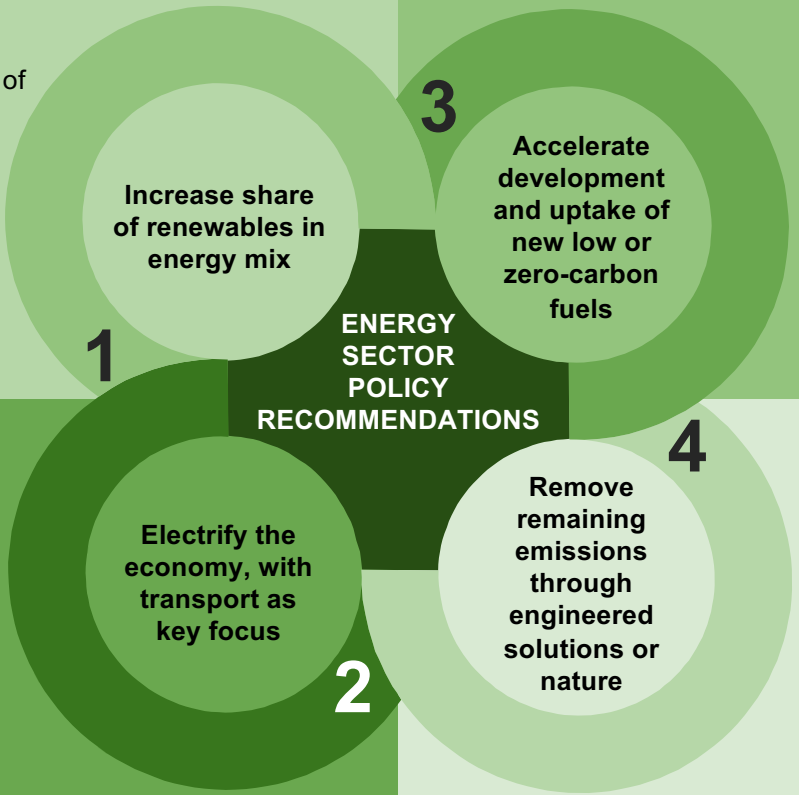
The energy sector can accelerate actions by better design, planning and adoption of low carbon technologies

Thematic Recommendations

1. Increase penetration of renewables.

2. Consider the best long-term power market structure to enable penetration of renewable energy/ greener generation.

3. Increase electrification and efficiency of road transport.



4. Develop and leverage new technologies e.g.. hydrogen, bioenergy, biofuels, and circular economy.

5. Scope and develop Carbon Capture and Utilisation (CCU) alongside Carbon Capture and Storage (CCS) industry.

6. Conserve and enhance forests.

Other Recommendations:

7. Fully leverage public-private partnerships.

8. Introduce carbon pricing to incentivise low-carbon solutions.

9. Intensify transparent Communication, Engagement and Public Awareness (CEPA).

10. Introduce mandatory carbon accounting and disclosure.

Policy recommendation 1: Increase share of renewables in energy mix

1 Thematic recommendation: Increase penetration of renewables

Barriers and challenges to accelerate the climate transition

- Grid constraints.
  - Grid enhancements need to keep pace with Variable Renewable Energy and Large Scale Solar.
  - Grid constraints, limited controllability and flexibility at high penetrations of distributed solar, particularly in low voltage grids.
  - High distributed solar penetration may lead to potential cost socialization to the wider customer base. This is because when many consumers subscribe to rooftop solar, a review on the payment structure is required which may shift certain cost components to the non-participating customers. (Most customers with rooftop solar PV will continue to be connected to grid and they are not fully self-supplied).

Private sector contribution to drive the climate transition

- Work with government to **align capital investments with government** RE policy.
- Initiate capacity building and knowledge sharing across value chain, particularly between large corporates or MNCs and SMEs.
- Technology innovation:
  - Private sector has innovations which can help resolve cost and technical challenges in grid stability and affordability, and can support continued innovation to enhance solutions.
  - Invest in commercialisation and scale-up of innovations. Both public and private investment in innovation must grow significantly. Innovation support should be coordinated across national governments and international initiatives, and with the private sector.

Government support to accelerate the transition

- To enable transition to renewables, strong political support, effective policies, continuous gradual grid network investments and support mechanisms facilitated by policy makers are required.
- Implement overarching **National Energy Policy** to ensure coherent and holistic energy policy decisions which balance trade-offs for overall country benefit, including managing the energy trilemma of equity, security, and environmental sustainability. National Energy Policy should bring together all policies and plans relating to energy production, distribution, and consumption, and bring clarity on overall country priorities for enhancing renewable power generation.
- **Engage and include private sector/industr**y in
  - Policy planning and RE target setting, including input to Planning and Implementation Committee for Electricity and Supply Tariff (JPPPET) of Malaysia.
  - Solving cost and technical challenges to advance renewables.
  - Encouraging technological innovation to support and encourage the growth of mixed renewable energy resources.
- **Incentivise private financing** through market and institutional reform as well as enhancing existing government incentives such as such as the Green Technology Financing Scheme, the Green Investment Tax Allowance and the Green Income Tax Exemption.
- **Financial support to encourage small and medium scale industries** to develop renewable energy: Government can help from promotion to commercialisation through grants, subsidies or credits.
- Lead by example: **Install rooftop solar** in government buildings.

Content

Policy recommendation 1: Increase share of renewables in energy mix (continued)

1 Thematic recommendation: Increase penetration of renewables (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Policy.
  ○ Limited engagement between public and private sector on RE policy. Industry and private sector unclear on government plans, targets and challenges.
  ○ Lack of clarity on priorities for development of renewable energy resources beyond solar, e.g.. hydropower, geothermal, bioenergy.
	• Install **rooftop solar** in their own buildings.	• Further facilitate the growth of RE, especially solar energy for self-consumption, by reviewing current limitation in the NEM guidelines.

Policy recommendation 1: Increase share of renewables in energy mix (continued)

2 Thematic recommendation 2: Consider the best long-term power market structure to enable penetration of renewable energy/ greener generation

Barriers and challenges to accelerate the climate transition

- Electricity market design: price signal distortion may occur when adding renewables to a power market designed for traditional resources, therefore requiring market reforms by the government.
- Decentralization of the power sector: Introduction of Third-party Access (TPA) to grid infrastructure is challenging as the grid needs to support a high number of generators (distributed generation), accommodate a diversity of generation technology (e.g.. renewables), and integrate new technologies (smart meters, battery storage, electric vehicles, etc).
- Retail market: how to reform the retail segment to allow for greater price differentiation and greater consumer choice, and how to reform commercial and industrial tariffs to encourage more efficient energy consumption. This allows customers to respond to price signals and encourages power producers to be more efficient.

Private sector contribution to drive the climate transition

- Work with government to **align capital investment plans** with market liberalization priorities.
- **Technology innovation**:
  - Private sector has innovations which can help resolve cost and technical challenges in grid stability and affordability, and can support continued innovation to enhance solutions.
  - Invest in commercialisation and scale-up of innovations. Both public and private investment in innovation must grow significantly. Innovation support should be coordinated across national governments and international initiatives, and with the private sector.

Government support to accelerate the transition

- **MESI 2.0 reform initiatives** that were announced in 2019 are currently being reviewed in the wake of COVID-19 pandemic, economic challenges and change in government. The Government has indicated that the reform is now aimed to:
  - Focus on human aspects and being people friendly, ensuring the well-being and interest of the people are taken care of.
  - Be in line with the government priorities to focus on reviving the economy post-COVID 19 pandemic.
  - Able to face future challenges and future-proofing MESI without changing the existing industry structure.
- **More engagement with industry and private sector** in co-creating solutions on energy trilemma, particularly on technical challenges for affordable solutions.
- **Technology innovation**:
  - Refresh innovation priorities to address new challenges of integrating high share of renewable power and increased electrification of end-use sectors, e.g.. transport, industry, buildings.
  - Emerging technologies such as digitalisation, local and grid-scale energy storage, EV smart charging, wider utilisation of mini-grids, etc will be crucial.

Policy recommendation 1: Increase share of renewables in energy mix (continued)

2 Thematic recommendation 2: Consider the best long-term power market structure to enable penetration of renewable energy/ greener generation (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
		• **Technology innovation (continued)**: ○ government to fund research that will create a pipeline of innovations, the best of which the private sector can refine and ultimately bring to market. • To ensure system reliability & power affordability, Single buyer & Grid System Operator (GSO) to continue to lead strategic, long-term integrated system planning to encourage generation investments to meet demand and the RE target, reduce surplus margin and manage investments in transmission & distribution.

Policy recommendation 2: Electrify the economy, with transport as key focus

3 Thematic recommendation 3: Increase electrification and efficiency of road transport

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Investor hesitation due to low adoption of EV. • Lack of EV charging stations due to price gap and market trust. • Data gap in terms of availability, accessibility, and transparency related to EV industry. • EVs are not cost-competitive compared to ICEs. • Lack of clarity and leadership for EV catalysation.	With long-terms policy certainty, private sector can: • **Strengthen R&D and innovation** to roll out technologies that contribute to adoption of EV (e.g.. battery technology & lifecycle, battery-as-a-service and disposal management). • Expand production through **complete knock-down** (CKD) which will also bring down EV price. • Private sector and industry players to **collaborate to match supply and demand** of EV and its infrastructure.	• I**mmediate implementation of Low Carbon Mobility Blueprint** (LCMB) with long-term policy certainty for industry to plan, act and invest. • **Enable private sector/industry participatio**n in policy design, implementation and monitoring. • Continuous enhancement of policy based on outcomes and **consultation** with industry, consumers and other stakeholders. • Improve **accuracy of data collection** activity and analysis for EV, e.g.. number of EVs sold, infrastructure availability, user charging patterns. • **Dedicated funding and financing** scheme for EV supply chain, including for end users. • Develop **local EV auto manufacturing** capability. • Attract more EV related FDI to partner with local automotive industry to accelerate EV adoption in Malaysia.

Policy recommendation 3: Accelerate development and uptake of new low or zero-carbon fuels

4 Thematic recommendation 4: Develop and leverage new technologies e.g.. hydrogen, bioenergy, biofuels, and circular economy

Barriers and challenges to accelerate the climate transition

- Lack of clarity and cohesive policy direction on priorities for development and implementation of low-carbon technologies.
- Coordination is needed across public and private sectors to align focus areas for technology deployment - private sector typically will not invest in early-stage innovations due to uncertain market potential, government's role is therefore to incentivise or fund basic research.
- Slowing progress in areas such as biofuels development.

Private sector contribution to drive the climate transition

- **Engage with government** to:
  - Understand and align technology development and innovation priorities across public and private sector.
  - Share challenges and ideas as well as co-create solutions.
- **Technology innovation**: Invest in commercialisation and scale-up of innovations. Both public and private investment in innovation must grow significantly. Innovation support should be coordinated across national governments and international initiatives, and with the private sector.

Government support to accelerate the transition

- Implement overarching **National Energy Policy (NEP)** to ensure coherent and holistic energy policy decisions which balance trade-offs for overall country benefit. NEP should bring together all policies and plans relating to energy production, distribution, and consumption, and bring clarity on direction of travel for the country.
- **Enable ecosystem for technology**:
  - Refresh low-carbon innovation priorities taking into account need to enhance existing solutions (e.g.. hydropower, solar) as well as develop new ones (e.g.. hydrogen, bioenergy).
  - Government to fund technology agnostic research that will create a pipeline of innovations, the best of which the private sector can refine and ultimately bring to market and encourage a value chain approach across the energy sector.
- **Engage with private sector** to
  - Plan and set targets as part of innovation cycle.
  - Encourage technological innovation to support and encourage the growth of low-carbon technologies, in line with country priorities – including engagement on appropriate incentives for investment.
  - Engage in international climate diplomacy to facilitate technology and best practice transfer.

Policy recommendation 4: Remove remaining emissions with technology or nature

5 Thematic recommendation: Scope and develop Carbon Capture and Utilisation (CCU) alongside Carbon Capture and Storage (CCS) industry

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Lack of understanding and data on the value of Carbon capture utilisation as well as storage (CCUS) to Malaysia, including potential for both deployment and their contribution to Malaysia's decarbonisation agenda as well as economic development. • Country's CCUS potential requires further appraisal to de-risk storage potential of identified fields and other formations. At this stage, the most advanced CCUS opportunity in Malaysia is only at conceptual study phase – the Kasawari Phase 2 project. • Malaysia does not currently have any regulations or policies that govern CO2 emissions or/and CCUS.	Collaborate with government to: • **Sponsor a study of the CCUS opportunity** in addressing emissions in the Energy sector in Malaysia, including development of a roadmap for the scale-up and roll-out of CCUS at scale. • Formulate a **national Carbon Capture and Utilisation (CCU) alongside Carbon Capture and Storage (CCS) strategies**.	Work with industry to: • **Design and implement policies** and regulations to enable, incentivize and accelerate deployment of CCUS based on the national strategy and roadmap. • **Consider best practices** from other countries for applicability to Malaysia, including: ○ *Assess and manage risks and opportunities*: (i) at minimum, assessment is needed in the areas of permitting & licensing, long-term CO2 liability, operational standards, and monitoring and verification; (ii) consider areas to enable cross border CO2 transport, which could create economies of scale, earn foreign income and realise Malaysia's potential as a regional storage hub. Potential to leverage alliances/treaties with ASEAN and others to broaden the CO2 market and accelerate global goals in achieving NZE. ○ *Sustainable financing*: potential forms of financing to incentivize CCS investments including tax incentives, public procurement of CCUS system and issuance of carbon credits from verified carbon storage, amongst others. • **Promote public awareness** of the safety, cost & technical feasibility, decarbonization and economic value of CCS as part of the overall national narrative to unlock cleaner energy solutions.

Foundational recommendation: Remove remaining emissions with technology or nature (continued)

6 Thematic recommendation 6: Conserve and enhance forests

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• The value of ecosystem services provided by standing forests is not accounted for in current economic thinking – forests are worth more to state governments cut down than left in place. • State governments face pressures to generate income – clearing forests for logging, mining, forest and oil palm plantations are traditionally reliable sources of income. Challenge is balancing the economic incentive vs long-term impact of deforestation. • Climate change policies are implemented at a federal level but land and forest matters fall within the jurisdiction of state governments, resulting in misalignment of priorities and actions.	• **Invest in forest protection** via carbon financing/nature-based solutions as part of decarbonisation ambition, abiding by emissions hierarchy of *avoid, reduce, compensate.* • Working directly with state governments and NGOs on the ground, private sector can **offset the opportunity costs of forest conservation** for state governments, as well as **diffuse project risks** for NGOs and state governments. • However, to enable private sector investment, clear policies are required to enable participation in the international voluntary carbon market, in the absence, currently, of a domestic carbon market.	**Redefine value of forests** • Value of forests must be considered holistically, e.g.. value of freshwater, oxygen, carbon storage. As a start, the costs of continued deforestation should be examined and accounted for, e.g.. infrastructure damage from flooding caused by forest lost. • Other countries and private sector entities are already reframing the conversation to take into account environmental and social dimensions of development, e.g.. ESG conditions in financing, carbon border adjustment mechanisms. The framework to understand and implement already exists (we don't have to recreate) and Malaysia risks being left behind if it does not also progress in parallel. **Harmonise federal and state priorities** • Enacting climate policy at state government level should be a primary focus, building on federal level policy priorities. • Existing mechanisms for federal-state consultation should be expanded to include climate matters. • State level climate policy should account for the protection of forests as carbon sinks. • By RMK-13, all states to institute a public consultation process before any deforestation project.

Foundational recommendation: Remove remaining emissions with technology or nature (continued)

6 Thematic recommendation 6: Conserve and enhance forests (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
		Carbon market development aligned to internationally recognized carbon standards (e.g... VERRA, Gold Standard) ● Clear and supportive policy for access to the international voluntary carbon market is key to facilitate private sector investment. ● Policy should consider best practices and developments in other countries for applicability in Malaysia. ● Enable society and community involvement to benefit from the forest offsets projects.

Foundational recommendation: Fully leverage public-private partnerships

7 Foundational recommendation 7: Fully leverage public-private partnerships

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Limited engagement on government policy and plans currently occurs between public and private sectors. • Governments cannot (and should not) bear the costs of the energy transition on their own, but private sector needs long-term policy certainty to make investment decisions. • Transition to a net-zero economy is complex with many interconnections that require all parts of society to move in step with one another. • Specific challenges exist in increasing renewables penetration, deploying new low-carbon technology and protecting forests - private sector can help but cannot do so without open engagement.	• Private sector can help to diffuse risks and costs to government by aligning investments with national decarbonisation priorities. • Private sector should organise themselves in a way which facilitates open and transparent industry engagements with government at multiple levels, e.g.. through CAN, industry associations. • Engage constructively with government to bring ideas and challenges up for discussion.	• Adopt inclusive, open engagement across policymaking and implementation to facilitate participation of private sector – this can create clarity in direction, sense of ownership, and more robust policy outcomes in capturing value from low carbon growths through a chain approach across the energy sector. This is crucial in safeguarding livelihoods and managing a just transition. • Set clear and long-term priorities which private sector can align plans and actions against.

Foundational recommendation: Introduce carbon pricing to incentivise low-carbon solutions

8 Foundational recommendation 8: Introduce carbon pricing to incentivise low-carbon solutions

Barriers and challenges to accelerate the climate transition

- Malaysia has utilised numerous policies to lower emissions since 2000s but these fragmented, command-and-control approaches have not led to systematic decarbonisation in Malaysia.
- EU recently announced carbon border adjustment mechanism (CBAM) which will apply to specific industries or sectors, some of which will impact Malaysia, from 2026 onwards – without a domestic carbon price, every dollar or euro or ringgit that is collected by a foreign government based on the carbon content of products produced in Malaysia but exported overseas is revenue foregone for the Malaysian government. Instead of us collecting carbon revenue, the foreign country will.
- Introducing a carbon price can be challenging due to lack of public awareness and understanding of carbon pricing – its goal, benefits, challenges and how regressive impacts can be addressed.
- May result in increased costs to end consumer and outsized impact on the B40 segment.

Private sector contribution to drive the climate transition

- Support government efforts to introduce carbon pricing.
- Adopt **shadow pricing** as in interim solution, before the introduction of a carbon price in Malaysia.
- Adopt practices to **track, monitor and report carbon emissions**, in anticipation of the introduction of carbon pricing.
- Encourage systematic approach on governance via 3rd party verification in accordance to international standard.

Government support to accelerate the transition

A carbon registry, framework and legislation on carbon pricing must be established as it is crucial and serves as fundamental building blocks for carbon pricing.

Implementation of carbon pricing warrants a holistic approach with clarity of objectives and understanding of the constraints and implications (such as cost). **All parties involved must be clear on the scope of implementation (across all sectors) and have a structured approach and proper public discourse and stakeholder engagements**.

The most important first step is to perform a holistic study with a rigorous assessment of benefits and trade-off. Consider learnings and best practices from other countries for applicability to Malaysia. This could include:

- Starting with the energy and transport sectors which encompass the bulk of Malaysia's total GHG emissions.
- Adopting a **gradual approach** to maximise social acceptance and minimise economic and political risks – price of carbon can be introduced at a relatively low rate (e.g.. USD 5/tonne) but gradually increasing over time.
- Implementation should account for and **address potentially regressive direct effects**, particularly on the B40 segment of society.

Foundational recommendation: Introduce carbon pricing to incentivise low-carbon solutions (continued)

8 Foundational recommendation 8: Introduce carbon pricing to incentivise low-carbon solutions (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

		• Carbon revenue should be paid into a **dedicated climate change fund** and be redistributed to:
		  ○ Address cost-of-living impacts to the B40.
		  ○ Provide funding for climate change mitigation and adaptation.
		  ○ Improve national GHG inventory management.
		  ○ Upskill and reskill Malaysians, especially youth.
		• In the interim, while designing an adequate carbon pricing regime, **shadow pricing** should be introduced to raise awareness of the cost of carbon emissions and make it easier to introduce a price on carbon later.
		• Initiate broad **public engagement** to address concerns and build support for carbon pricing, with a view of introducing it in near future (to support our pledge during Paris agreement COP21).
		• **Transparency** in distribution of carbon revenue – a dashboard that tracks how much funds have been collected and how the funds are used should be considered (see point 9).
		• Consider ASEAN linkages to increase liquidity.
		• Reduce existing market distortions, e.g.. the fuel subsidy. Funds saved can be used for more targeted aid to B40 households.

Foundational recommendation: Intensify transparent Communication, Engagement and Public Awareness

9 Foundational recommendation 9: Intensify transparent Communication, Engagement and Public Awareness (CEPA)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Understanding of climate change is low, especially at the level of state government and non-urban communities. • This results in inaction and no sense of "ownership" of the problem and solutions - the transition to net-zero is complex and requires all parts of society to move in step with one another.	• Private sector can **work with government** to shape and rollout public engagement initiatives on Malaysia's net-zero journey. – e.g.. CAN and the government can collaborate on an annual programme to solicit stakeholder feedback as well as public opinion as input to government.	• Adopt an **open data** approach and allowing broader public access to information. • **Collaborate with private sector** on key public engagement initiatives, starting with the design of a web-based dashboard which tracks our progress against key metrics in Malaysia's decarbonisation journey. • Make climate change material more **accessible**, e.g.. communicating in different languages and via channels accessible by state governments and local communities. • Behavioural change at all levels requires new ideas and collaborations, e.g.. bring together psychologists, behavioural scientists and communicators to seek solutions. • Embed energy transition and environmental awareness in education syllabus and awareness campaigns at school and universities to create a climate savvy society.

Foundational recommendation: Introduce mandatory carbon accounting and disclosure

10 Foundational recommendation 10: Introduce mandatory carbon accounting and disclosure

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Designing effective decarbonisation roadmaps and tracking progress against them requires an effective monitoring, reporting and verification carbon accounting process – there are no current requirements for corporate carbon reporting. • Standardised carbon accounting is also required as a precursor to any carbon tax or carbon trading schemes. • Carbon disclosures also form part of ESG requirements for financing.	• Initiate actions to **start measuring, monitoring and reporting** carbon emissions. • **Collaborate and share knowledge** amongst private sector to build overall industry capacity in carbon accounting and reporting. • Leverage international framework and standards for reporting and disclosure.	• **Require all listed companies to disclose carbon emissions** in their annual reporting, starting with scope 1 and 2, and subsequently scope 3. • Provide **support and capacity building** for companies to track, measure and report emissions data.

5 Property & Construction sector

Acknowledgement of Roundtable Participation

Property and Construction sector

This report has been prepared through engagement and consultation with the following ministries, agencies and associations.

Federal Ministries

- Ministry of Housing and Local Government (KPKT)

Federal Agencies:

- Suruhanjaya Tenaga (ST)
- Construction Industry Development Board (CIDB)

Associations

- Real Estate and Housing Developers Association (REHDA)
- Master Builders Association Malaysia (MBAM)
- Institute of Engineers Malaysia (IEM)
- Pertubuhan Akitek Malaysia (PAM)
- Association of Consulting Architects Malaysia (ACAM)
- Malaysian Institute of Planners (MIP)
- Cement and Concrete Association of Malaysia (CNCA)

Secretariat:

- Green Real Estate (GreenRE)
- Sime Darby Property Berhad (SDP)

Other bodies

- Tropical Rainforest and Conservation Centre (TRCRC)
- World Wide Fund for Nature (WWF)
- Malaysian Airconditioning and Refrigeration Association (MACRA)
- Malaysian Society of Heating, Refrigeration and Air Conditioning (MASHRAE)
- Malaysian Association of Energy Service Companies (MAESCO)
- Malaysian Photovoltaic Association (MPIA)
- Malaysian Green Building Council (MalaysiaGBC)
- European Chambers of Commerce (EuroCham)

Carbon footprint from the property and construction sector exists along the whole value chain from materials manufacturing, construction to operation of buildings

Malaysia's construction industry accounted for 4.6% or RM53.4 billion in 2020 GDP (Source: Trading Economics), and is expected to grow by 13.9% in 2021 (The Edge Markets, 2020). In 2016, manufacturing and construction was the third largest contributor of CO2 emissions at 9% (Third Biennial Update Report to the UNFCCC, 2020). It is important to reconsider the whole value chain along the property and construction sector given that the carbon footprint exists from the construction all the way through the operation of completed buildings. For example, the consumption of cement has high carbon emissions, with some estimates that it globally it contributes to 8% of the world's carbon emissions (BBC, 2018). In 2016, the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCrest) was adopted by Public Works Department, making it mandatory for all government building projects worth RM50mil and above to adopt MyCrest to reduce carbon emissions in the construction industry. In July 2021, the National Low Carbon Cities Masterplan (NLCCM) was launched proposing a five year plan to promote low carbon cities.

33 Cities selected in NLCCM to implement measures to achieve carbon neutrality

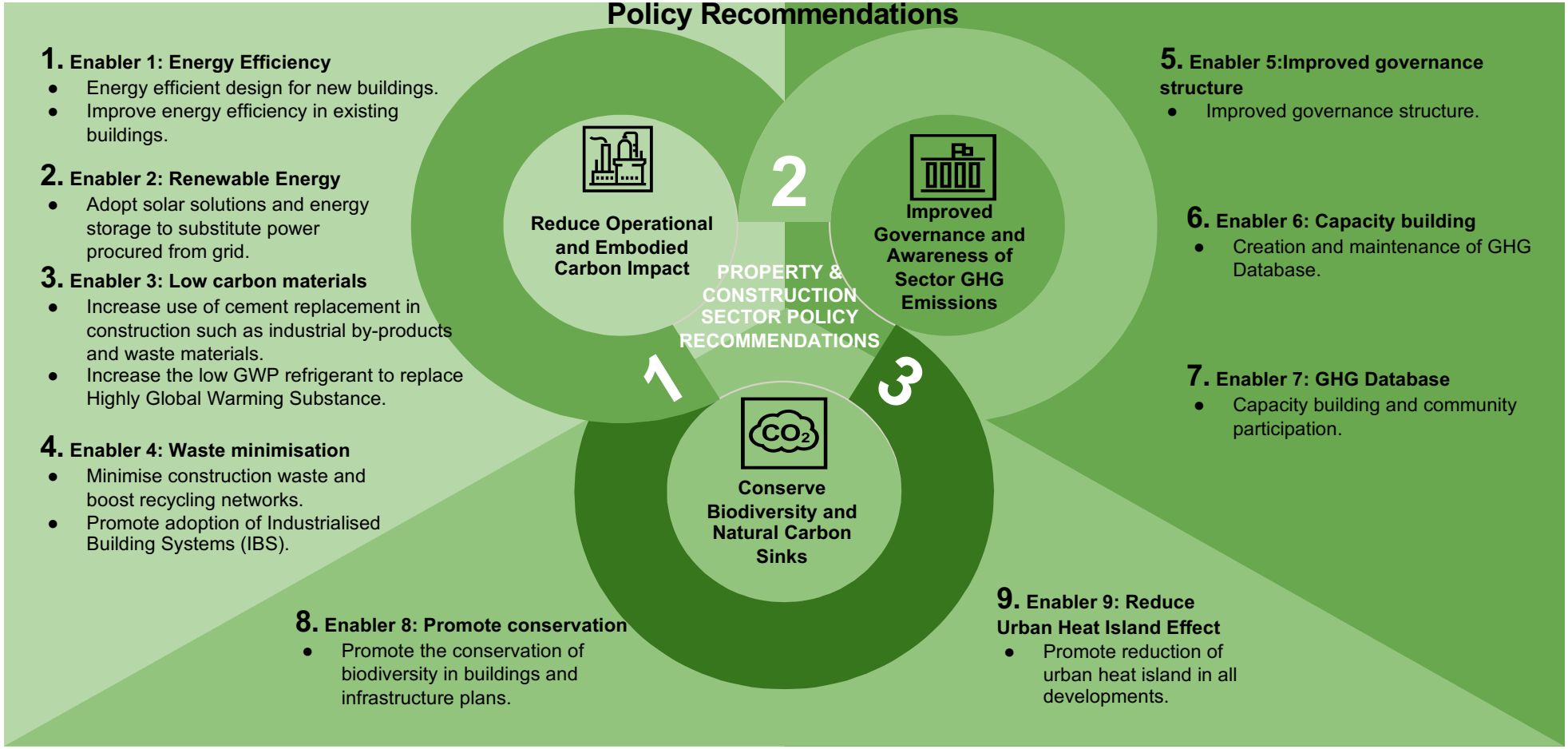
50% Potential energy savings for green buildings

Common themes emerged from the roundtable engagements, forming the basis of the sectoral recommendations:

1. Reducing carbon footprint should be a combination of adopting energy efficient practices and using renewable energy as a primary energy source.
2. Behavioural changes such as materials used for construction or waste management should be embedded within industry processes.

Source: National Low Carbon Cities Masterplan; Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCrest); Sharif S, Kamaruzzaman SN 'Implementation framework of green building for government funding: Menara kerja Raya , Malaysia'.

The property and construction sector can utilise energy efficient design, low carbon materials and waste minimisation towards climate-friendly solutions



Policy recommendation 1: Reduce operational and embodied carbon impact

1 Enabler 1: Energy Efficiency- Energy efficient design for new buildings

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Regulations that mandate energy efficiency considerations have not been passed. • Insufficient incentives to drive adoption of EE improvement measures.	• To implement requirements of UBBL-38A in all new projects. • The impending Energy Efficiency and Conservation Act (EECA) will provide the legal framework for private sector compliance to energy efficiency targets.	• Energy Efficiency and Conservation Act (EECA) to be enacted immediately. Medium to long term EE targets to be set i.e.. 2030 – 2050. ○ Action by: Federal ○ Timeline: < 1 year. . • Establish a dedicated building sector EE Regulation under the EECA with mandatory EE Building Codes for new buildings. Set target for 40% improvement in the baseline of Building Energy Intensity (BEI) from MS 1525:2019 by 2030s. ○ Action by: Federal ○ Timeline: < 1 year. • Enforce amendment to UBBL - clause38A (OTTV, RTTV and roof u-value) across whole of Malaysia at local authority level. This has been gazetted in three states namely Selangor, Penang and Terengganu. However, implementation and enforcement at local authority level is lacking. ○ Action by: Federal ○ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

1 Enabler 1: Energy Efficiency- Energy efficient design for new buildings (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
		• Promote and mandate suitable tropical green building certification and rating (minimum Silver certified – from established local certification bodies i.e.. GreenRE, GBI or MyCrest) for all new buildings >2000m2 (all sectors – residential, commercial, healthcare, retail and hospitality). This will ensure appropriate integration of passive and active design features. GTMP has set a target of 1,750 green buildings by 2030 (currently less than 250 buildings). This target should be revised to 20% of building stock in Malaysia by GFA in Malaysia by 2030. (4% as of 2020). . • Incentives: • Provide income tax exemptions to all developers for developing and sale of green-certified buildings – residential and commercial. **OR** Alternatively, widen the scope of the existing project investment tax allowance currently administered by MIDA by extending the income tax allowance (ITA) to the developer of residential and strata commercial titled buildings of the discounted value of the incremental green cost.

Policy recommendation 1: Reduce operational and embodied carbon impact

1 Enabler 1: Energy Efficiency- Energy efficient design for new buildings (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

		• Incentives (continued):
		  • Continuation of the existing Green Technology Tax Incentives under MIDA/MGTC beyond 2023. . These incentives should be approved in blocks of 10 years to provide certainty to property developers as typical building projects take between 5-6 years from concept through to completion.
		  • State Gov / LAs to give incentives such as higher plot ratio or density for projects with Gold / Platinum green certification.
		  • State Gov / LAS to lower compliance costs and/or development charges to encourage wider adoption of green buildings. (e.g. 10% Assessment rate reduction for first 3 certification years, two thirds (2/3) development charge rebates returned in 3 stages, stage 1 at CCC and green certification, stage 2 on 2nd year and stage 3 on third year for gold or platinum green buildings achieving 30-50% EE) The rationale being that green-certified buildings will use less utilities, require less infrastructure and generate less waste.
		  • Excise duty and sales tax exemption for all green labelled / certified building materials.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

1 Enabler 1: Energy Efficiency- Improve energy efficiency in existing buildings

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Lack of incentives.
• Lack of awareness.
• Poor promotion of available investment tax allowances.
	• Implement advanced building management processes and systems to improve EE.
	• The Energy Efficiency and Conservation Act (EECA) will provide the legal framework for private sector compliance to energy efficiency targets.
		• Establish a dedicated building sector EE regulation under the EECA with mandatory EE building codes for existing buildings. Set suitable baseline building energy intensity in accordance to MS-1525:2019 and in alignment to long term EE targets as part of EECA. Initial focus to be on commercial buildings older than 15 years as follows.
		• Mandatory energy audits / energy management audits to check compliance to proposed regulations every 5 years.
		• All buildings with centralized HVAC systems to incorporate Building Automation System (BAS) / Building Management Systems (BMS) to track and control performance of chiller system.
		• Mandatory upgrade of chiller plant for buildings with centralized HVAC systems not meeting performance benchmarked to MS 1525:2019.
		• REEM auditors to ensure compliance to 30% minimum EE savings target.
		• Promote the Energy Performance Contracting (EPC) form of retrofitting by ESCOs.
		• Existing buildings to phase out HFC based refrigerants by 2026.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

1 Enabler 1: Energy Efficiency- Improve energy efficiency in existing buildings (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

	.	• Incentives:
		  ◦ Building energy audits to be eligible for double tax deduction which will encourage building owners to benchmark their active systems and identify appropriate elements to be upgraded.
		  ◦ Building tenants' rental payment to be eligible for double tax deduction and landlords' rental income to be tax exempt through application of green leases in green building certified projects.
		  ◦ Widen the database of MyHIJAU listed Energy Efficient (EE) equipment eligible for investment tax allowance. Automatic reciprocal recognition of products already certified under established foreign green labelling / certification schemes. Automatic inclusion into MyHIJAU database based on performance-based metrics of EE equipment with minimum 30% improvement benchmarked to MS-1525:2019.
		  ◦ State / local authorities to provide assessment fee rebates for buildings that undertake green building recertification.
		  ▪ Action by: Federal, State, Local Authorities
		  ▪ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

2 Enabler 2: Renewable Energy: Adopt solar solutions and energy storage to substitute power procured from grid

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Lack of awareness.
• No CAPEX incentives for residential customers.
• The market has also grown at such a pace that it has outgrown and outrun the present guidelines which are based on fossil fuel based generation (e.g.. fault current limitations, quota of 300MW of NEM 3.0 allocated for commercial and industrial sector fully exhausted within 3 months.
	• Newer constructions can look at integrating solar power solutions at the planning stages to ensure availability of adequate roof space.
	• Banking sector to improve financing options available for rooftop solar.
	• Present PV pricing is good and there is a strong demand from RE100 companies. The market has also indicated that it has the appetite for investment with the right policy consistency in place.
	• Private sector keeps abreast of the latest solutions and technologies and should be allowed to assist the government to provide cutting edge solutions being used elsewhere with positive results.
		• To reinstate 1:1 net metering (NEM) for solar installation and significantly increase available quota. (Currently Residential only 100MW and commercial 300MW). Maintain 1:1 NEM until battery technology gains parity.
		• Staged grid reforms to allow for acceptance of a distributed power generation.
		• Policies and enablers such as Time of Use (ToU) MESI2.0, P2P energy trading and 3rd party access would allow for arbitrage opportunities and the creation of new business models (e.g. energy as a service) to encourage growth in other sectors.
		• Enabling third party access to the grid will allow other types of renewable energy to take part in front of meter (FTM) Corporate.
		• PPA arrangement to sell to companies as funding for Feed-in Tariff (FiT) by SEDA comes to an end for these renewable resources.
		• Development of grid charges should be transparent and reasonable. Adoption of renewable energy should also include other potential RE such as biogas, biomass etc.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

3 Enabler 3: Low Carbon Materials- Increase use of cement replacement in construction such as industrial by-products and waste materials (e.g.. PFA and GGBS)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• There is a misguided perception that green cement is more costly. The price is comparable to the price of OPC.
• The codes of practice that is applicable in Malaysia, adequately addresses and permits the use of cement replacement.
• Cement replacement with supplementary cementitious materials, depending on the quantity and type of supplementary cementitious material (SCM), may or may not affect setting time and early strength gain. Example for 40% replacement of GGBS, compared to 40% replacement of PFA or fly ash, 40% GGBS may not affect the strength as much as 40% replacement of fly ash. Nevertheless, concrete strength can be managed by admixtures and cementitious content. Published guidelines and reference documents show that up to 40% replacement has no or negligible impact.
	• Concrete suppliers should make green cement replacement available at competitive rates.
	• Products should be made widely available.
	• Developers / consulting engineers to specify application of green concrete in projects.
		• The price of concrete incorporating SCM to replace OPC should not come at a premium to normal concrete for the same application.
		• To introduce statutory requirement for cement replacement with industrial by-products of between 15%-40% in concrete mix by 2023 (PFA/GGBS) for projects in Malaysia.
		• Regulate price of PFA and GGBS supply.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

3 Enabler 3: Low Carbon Materials- Increase the low GWP refrigerant to replace Highly Global Warming Substance

Barriers and challenges to accelerate the climate transition

- There is no better refrigerant to replace existing synthetic refrigerant that causing global warming.
- There is a misguided perception that natural refrigerant is highly flammable and dangerous. The codes of practice, including MS2678:2017 that is applicable in Malaysia, adequately addresses and permits the use of flammable refrigerant system including Flammable HFO, Flammable HFC and Natural Refrigerant.
- There are also false perceptions on the product safety due to uses of flammable refrigerant but green input to HVAC&R. The IECEE/CB scheme, IEC 60335-2-40 enabled the test on Safety of household and similar electrical appliances and comply to Malaysia Electrical Act.

Private sector contribution to drive the climate transition

- HVAC&R Supplier and Manufacturer should invent more low GWP refrigerant alternative product at competitive price rather than emphasizing energy efficiency improvement but neglect the impact of Super Greenhouse Gas.
- Products should be made widely available. Developers / Consulting Engineers to specify application of low GWP refrigerant product in projects.
- Architect design the designated site installation comply to use of low GWP refrigerant product.

Government support to accelerate the transition

- Malaysia has ratified the Kigali Amendment for Montreal Protocol on 21st October 2020.
- Malaysia is Obligated to phase down HFC (GWP>300) based on the baseline as below:

Year	Reduction
2029	10%
2035	35%
2040	50%
2045	80%

HFC phase-down baseline were projected based on the survey that DOE did under the enabling activities in 2019, as below:

- Average HFC Consumption (2020, 2021, 2022) = 21.93 mil tCO2 equivalent.
- 65% of HCFC Baseline = 8.2mil tCO2 equivalent.
- Projected Baseline = 30.13mil tCO2 equivalent.
- Enhance Certified Service Technician Program CSTP Mandated for HVAC&R Technician.
- Incur Carbon footprint tax towards high GWP refrigerant products and sales tax exemption on low GWP refrigerant products.

Policy recommendation 1: Reduce operational and embodied carbon impact

4 Enabler 4: Waste Minimisation- Minimise construction waste and boost recycling networks

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
● Lack of innovation in design. ● Lack of enforcement of regulations. ● Lack of guidelines and requirements for 3rd party certification to accurately disclose recycled content in materials.	● Design out waste. ● Lean design principles. ● Increase R&D, proof of concept and commercialisation of recycled materials into new buildings, infrastructure and hard landscape.	● To promote the adoption of 3R (reduce, reuse, recycle) strategy in construction. ● To enforce separation of waste act (Act 672) in all states. Initial target of reduction of waste to landfill by 30% by 2030. Minimize construction waste aiming for Zero construction waste by 2050 and boost recycling networks/sector including R&D for circular economy. ● To introduce regulations to increase the recycled content in building materials by requiring the utilization of recycled content of at least 10% based on material cost, of the total value of the materials in the project. ○ Action by: Federal, State, Local Authorities ○ Timeline: < 1 year.

Policy recommendation 1: Reduce operational and embodied carbon impact

4 Enabler 4: Waste Minimisation- Promote adoption of Industrialised Building Systems (IBS)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Inefficient IBS ecosystem.
• Customer's perception and acceptance levels.
• High upfront costs.
• Mismatch of incentives with market needs.
• Cheap foreign labour wages for conventional construction activities.
• Developers have to comply with laws and regulations. They will only use those materials that approved and fulfilled the requirements. However, not all green materials are approved by the building codes and by-laws.
	• Explore feasibility in adopting IBS for every project and execute when economies of scale make them viable investment decisions.
	• Increase IBS R&D and commercialisation.
		• Revise UBBL and relevant building codes to be more performance based rather than material based. This will encourage wider spectrum of IBS components.
		• Incentives:
		  • To consider income tax exemptions for developers on revenue from sale of >70 IBS projects and tax-free status on sale of IBS products and services (supply chain) to boost economies of scale and lower the costs of IBS in the long term.
		  • Alternatively, state / Local Authorities to give incentives such as higher plot ratio or density for projects with IBS scores > 70. Reducing compliance costs and/or development charges will also encourage wider adoption of IBS.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 1 year.

Policy recommendation 2: Improved Governance and Awareness of Sector GHG Emissions

5 Enabler 5: Improved governance structure

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Lack of coordination between relevant ministries to implement policy action.
• LAs are not well versed in implementing / enforcing regulations.
	• Promote carbon footprint measurement and disclosure. PLCs first then adopted by SMEs.
	• PLCs establish Board Sustainability Committees to enable compliance to MCCG (April 2021 version).
		• Set up a central coordinating body / PMO to oversee implementation of action items and activities with respect to climate change to flow through all 3 levels of Government – Federal, State, Local Authority.
		• Local Authorities to appoint a champion to report on progress to achieve climate ambitions set out in the NLCCM.
		• Set up a merit-based think tank committee from private sector to provide policy recommendations and drive national action.
		• Set absolute GHG emissions reduction targets as opposed to intensity. Set a net zero roadmap for Malaysia by 2055-2060.
		• Make carbon measurement, disclosure and data assurance mandatory for PLCs immediately. Introduce a standardized carbon calculator to suit local requirements to encourage adoption and participation.
		• Make the same mandatory requirements for SME in a phased approach (larger to smaller) over the next 3 years.
		  ○ Action by: Federal, State, Local Authorities, Regulatory Authorities
		  ○ Timeline: < 3 years.

Policy recommendation 2: Improved Governance and Awareness of Sector GHG Emissions

6 Enabler 6: Capacity building- Creation and maintenance of database on GHG emissions

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Lack of inter-agency collaboration from local level up to federal level, making data collection exercise very difficult.
• The accuracy, availability and coverage of data are still very low. Lack of transparency and reporting structure on data resources from bottom to top level.
	• To adopt smart technologies for populating database.
	• All companies to endeavour to implement carbon footprint accounting and set carbon reduction targets.
		• Data on GHG Emission could be collected from companies by government (through central coordinating body).
		• Common reporting framework that defines key metrics for data collection. (i.e. energy, water and waste). Offsets to be defined.
		• To mandate GHG reporting through regulations.
		• Promote use of smart technologies for data gathering.
		• Release of timely data as BUR report is 4 years behind. (Preferably a yearly review and report).
		• Make carbon disclosure and data assurance mandatory for PLCs.
		  ○ Action by: Federal, State, Local Authorities, Regulatory Authorities
		  ○ Timeline: < 3 years.

Policy recommendation 2: Improved Governance and Awareness of Sector GHG Emissions

7 Enabler 7: GHG Database- Capacity building and community participation

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Absence of an existing established competence framework on climate change that can easily be adopted.
• Lack of coordination and communication from the government on sustainability.
	• Engineering / Architectural Professional bodies to include components of green awareness within assessment process for professional recognition.
	• Set up peer-to-peer learning and knowledge sharing by experienced companies to those beginning carbon footprint accounting and target setting.
	• Engage with subject matter experts to conduct knowledge drives, awareness and education campaigns through respective property industry bodies to their member base e.g... REHDA, MBAM, supply chain associations.
		• State and Local Authorities to be trained on enforcement of relevant regulations. Push factor.
		• State and Local Authorities to engage with subject-matter experts to conduct knowledge drives, awareness and education campaigns to the public on the climate change emergency.
		• Local authorities to coordinate and encourage community engagement and participation activities (e.g. MBPJ has an assessment fee rebate for homes that comply with green best practices; e.g... immediately implement waste separation at source policy across all districts).
		• Update school / university syllabus to raise awareness and create pull factor.
		• Set a common Malaysian carbon assessment framework setting out standards for compliance for water, waste, power, tropical forest sequestration, renewable energy that will enable government to track progress.
		• Allocate funding for Malaysian start-ups (academic or private) to exploit promising ideas and research.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 5 years.

Policy recommendation 3: Conserve biodiversity and natural carbon sinks

8 Enabler 8: Promote Conservation- Promote the conservation of biodiversity in buildings and infrastructure plans

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• The challenges for the sector lie in the lack of strong leadership for conservation activity and unwillingness of society to pay the increased cost associated with sustainable activities.	• Developers to apply increased tree planting ratio of native species that serve to increase conservation and store carbon. • Apply process of high-density tree planting as carbon sinks. • Companies to adopt shadow pricing disclosure of carbon emissions to communicate impact of pricing to their business profitability.	• Government needs to better engage with the private sector - there is a lot of good work being done by the private sector which should be highlighted and encouraged. • Low Carbon Cities Catalyst Grant to distribute funds to more Local Authorities. • Government to set carbon price to enable companies to determine impact through shadow pricing. • All local authorities to require the planting of indigenous species / drought resistant plants within their districts and in all new developments. • Incentives / Disincentives: ◦ Provide incentives for developers to increase carbon sinks (e.g.. biodiverse mini forests that require minimal maintenance after 3 years) versus current practice of planting exotic plants (e.g. Assessment rebates / double tax deductions for planting indigenous / drought resistant plants - rebates / deduction applicable 1 year after planting upon survival of plants.)

Policy recommendation 3: Conserve biodiversity and natural carbon sinks

8 Enabler 8: Promote Conservation- Promote the conservation of biodiversity in buildings and infrastructure plans (continued)

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
		● Incentives / Disincentives (continued): ● Set up an environment conservation fund. Significant polluters such as power generation companies and other dirty industries will contribute a % of their revenues based on carbon pricing into an Environment Conservation Fund. The funds collected will be channelled to the specific State Government agencies in charge of preserving and conserving gazetted forests/green spaces towards ensuring these forests/spaces remain conserved. The financial incentives received must exceed the potential revenue from sale of these lands. ○ Action by: Federal, State, Local Authorities ○ Timeline: < 3 years.

Policy recommendation 3: Conserve biodiversity and natural carbon sinks

8 Enabler 8: Promote Conservation- Promote reduction of urban heat island in all developments

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• The challenges for this sector lies in over development in cities with decrease of urban greenery causing Urban Heat Island effect with measured temperature rise where localities with high developments.	• Developments need to increase the urban greenery and green plot ratio within sites to mitigate temperature rise.
	• Green building certification to be mandated for all new projects with a minimum green plot ratio requirement as a prerequisite criteria.
		• PLAN Malaysia to incorporate the Green Plot Ratio metric (GnPR) into planning guidelines to encourage adoption of greenery in high density urban settings. To be adopted by respective PLANs in State Governments and Local Authorities.
		• To determine appropriate tree or palm species to be planted along walkways for shading purposes.
		  ○ Action by: Federal, State, Local Authorities
		  ○ Timeline: < 1 year.

6 Plantations sector

Acknowledgement of Roundtable Participation

Plantations sector

This report has been prepared through engagement and consultation with the following ministries, agencies and associations.

Contributors

- Monash-Industry Palm Oil Education and Research Platform
- Sime Darby Plantation
- IRGA Sdn. Bhd.
- IOI Corporation Berhad
- Bluenumber
- Musim Mas Group
- South East Asia Rainforest Research Partnership (SEARRP)
- Datuk Darrel Webber, technical advisor, ex-RSPO
- Dr Simon Lord

Moderators

- Dr. Gary Theseira, Malaysian Green Technology and Climate Change Centre (MGTCCC)
- Dr. Kalanithi Nesaretnam, CGM, IOI

Malaysia's plantations sector is a key economic contributor, and has plenty of opportunities to adopt low carbon solutions

Malaysia's agriculture, forestry and fishing sector accounted for 8.2% of 2020 GDP (source: World Bank). While agriculture only contributed to 4% of 2016 GHG emissions, its interaction with natural net sink assets should not be discounted. Agriculture is highly important to Malaysia as can be seen with Malaysia being the second largest palm oil producer in the world, and the certain areas within agriculture such as biomass and smart-farming has been identified as the drivers and sources of growth under the 12th Malaysia Plan (MIDA, 2021). However, the concerns of sustainability within the agriculture context had been highly publicised such as seen in palm oil exports to the EU. It is important for Malaysia to address this to ensure the sustainability of agriculture as it plays a key role within socioeconomic development.

44% N_2O share of agricultural emission due to agricultural soil from 1990-2016

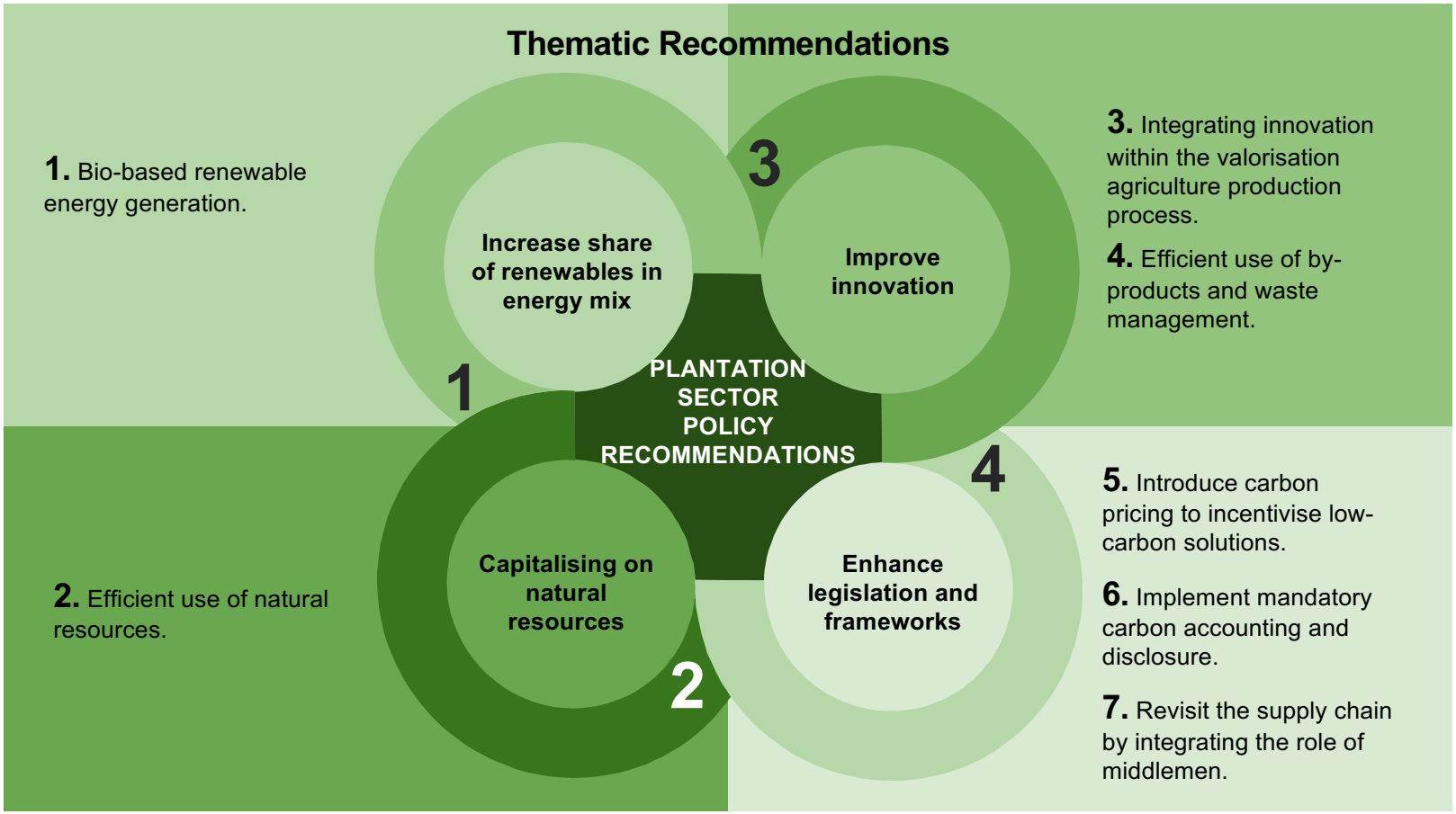
168 million Tonnes of biomass produced by Malaysia

Source: Malaysian Investment Development Authority; World Bank.

Common themes emerged from the roundtable engagements, forming the basis of the sectoral recommendations for the plantations sector:

- Private sector should drive extensive use of biomass sources as renewable energy potential. This should be leveraged by plantation sectors across the whole value chain such as solid biomass, palm oil effluents and refined products.
- Companies should encourage and implement innovation in production techniques to reduce carbon and water footprint.
- Companies should capitalise on efficient usage of natural resources such as through waste valorisation. Government should encourage this through capital incentives and support.
- Government must incentivise and facilitate low-carbon solutions and technologies through fiscal measures such as carbon pricing (and shadow pricing in the interim) and credits and green financing.

The plantations sector can capitalise on natural resources and increase innovation and use of renewable energy with the support of an enabling regulatory framework



Content

Policy recommendation 1: Increase share of renewables in energy mix

1 Bio-based Renewable Energy Generation

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• There is insufficient transparency and management of data. For example, the use or movement of palm-based feedstocks is largely not monitored or tracked, resulting in difficulty in carbon reporting. • There is little motivation or incentive to use palm-based feedstocks for decarbonisation. • Stakeholders are unsure of the value potential in unlocking the conversion process of production areas that have yet to be commercialised. For example, processes such as pyrolysis, hydrolysis and fermentation have yet to be unlocked to generate renewable energy.	• Track and monitor the supply chain and usage of biomass. • Usage of bioenergy as a renewable energy source to address the renewable energy target and greenhouse gas intensity reduction targets. • Set up centralized biomass collection and pre-processing centres to improve overall logistics, pre-treat biomass, ensure consistent supply of biomass and to improve the economy of scale. • Utilising extensive sources of energy potential from across the value chain- from solid biomass (such as fronds, empty fruit bunches and trunks) to palm oil mill effluents and refined product oils. Avoid usage of fronds or palm trunks to maintain soil carbon content, soil structure and for fertility. • Unlocking of mill potential to go beyond net-zero carbon emissions and become carbon negative production units by exporting excess electricity and biomass mills produces. • Eliminate the discharge of methane into the atmosphere by utilising methane from POME ponds to generate renewable energy via methane generators or co-firing of boilers.	• Provide support and capacity building for companies to track, measure and report movement of palm-based feedstocks to drive carbon reporting. • Provide incentives and support for companies to use palm-based feedstocks and encourage sharing of energy efficient and low carbon based technology and solutions. • Encourage electricity generating companies such as TNB to work with the industry such as MPOA to set up biomass generating units throughout the country to maximise renewable electricity generation from fibre and empty fruit bunches from Palm Oil mills within a radius of 100km. • Agree accelerated depreciation rates for approved methane capture and reuse plants. The favourable rates should be reduced over the next 5 years, which is then changed to an increasingly aggressive tax on every tonne of methane produced.

Policy recommendation 2: Capitalising on natural resources

2 Efficient use of natural resources

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Finding a profitable business model aided by the right public policies and fiscal support. • Insufficient technology and infrastructure readiness to support efficient use of resources.	• Companies must take aggressive steps to minimise carbon cost part of each metric tonne of crude palm oil produced mill by mill as well other agricultural produce, in line with buyers preferences which will demand this. This will involve retiring large areas of oil palm or other agricultural land by planting with peat. • Companies or land owners should use coastal areas made unsuitable for cultivation due to encroaching salinity or increased flooding due to sea level rise and roofed over areas at mills for large scale solar electricity generation.	• Government to offer favourable depreciation rates to large scale solar generating proposals.

Policy recommendation 3: Improve innovation

3 Integrating innovation within the agriculture production process

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• There is currently insufficient available land resource for agriculture development. • Trends show stagnating yields and rising costs (such as labour) for some of Malaysia's biggest industries such as palm oil, which may result in overdevelopment of land for agricultural use. • Highly taxed industry and major contributor to Malaysia government revenue, which may reduce the reserves of companies which would otherwise be spent on R&D.	• Increase the use of genomic technology to create more climate resilient planting materials. • Enhance plantation management practice (including the harvesting process) through the use of robotics, IOT devices, advanced imaging and mechanisation. • Enhance oil extraction during milling by using enzymes and the adoption of AI in the refinery processes. • Target carbon reduction from methane produced at palm oil mill effluents by converting into renewable energy. Renewable energy produced has potential to reduce the industry's carbon footprint by more than 40%.	• Necessary for government to sponsor and work with industry in commercialisation of high impact strategic projects which have large investment cost. • DNA testing for seed quality should be a regulatory requirement & SIRIM standard for planting material. Government or regulatory agencies should provide assistance to smallholder sector to plant only tested seedlings. • It is important for government to continue sponsoring basic and applied R&D to capitalise on potential high payoff from agriculture. • For industries which are highly taxed (for example palm oil), a fraction of these taxes collected should be channelled back for R&D and commercialisation activities.

Policy recommendation 3: Improve innovation

4 Efficient use of by-products and waste management

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition

• Waste valorisation of biomass requires incentives as capex is large and expensive.
• Green financing exists but is highly bureaucratic.
	• Improve valorisation of biomass through:
	  ○ Empty fruit bunches opportunities converted to nanocellulose.
	  ○ Palm pressed fibre converted to de-oiled fibre for pulp and enriched oil for feed.
	  ○ Palm kernel cake converted to enhanced enzymes as improved feed (for better digestibility).
		• Sponsor and work with industry to commercialize high impact innovative solutions for increased adoption of efficient use of by-products and effective waste management practices.

Policy recommendation 4: Enhance legislation and frameworks

5 Introduce carbon pricing to incentivise low-carbon solutions

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Malaysia has utilised numerous policies to lower emissions since 2000s but these fragmented, command-and-control approaches have not led to systematic decarbonisation in Malaysia. • EU recently announced carbon border adjustment mechanism (CBAM) which will apply to specific industries or sectors, some of which will impact Malaysia, from 2026 onwards – without a domestic carbon price, every dollar or euro or ringgit that is collected by a foreign government based on the carbon content of products produced in Malaysia but exported overseas is revenue foregone for the Malaysian government. Instead of us collecting carbon revenue, the foreign country will. • Introducing a carbon price can be challenging due to lack of public awareness and understanding of carbon pricing – its goal, benefits, challenges and how regressive impacts can be addressed. • May result in increased costs to end consumer and outsized impact on the B40 segment.	• Support government efforts to introduce carbon pricing. • Offset remaining carbon emissions through purchasing of carbon credits, ensuring permanent protection for all remaining forested areas in the country.	• Initiate broad public engagement to address concerns and build support for carbon pricing, with a view of introducing it in RMK-13. • Federal and state governments should liaise to encourage internationally approved and audited carbon credit schemes to preserve in perpetuity all remaining forests.

Policy recommendation 4: Enhance legislation and frameworks

6 Implement mandatory carbon accounting and disclosure

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Designing effective decarbonisation roadmaps and tracking progress against them requires an effective monitoring, reporting and verification carbon accounting process – there are no current requirements for corporate carbon reporting. • Standardised carbon accounting is also required as a precursor to any carbon tax or carbon trading schemes. • Carbon disclosures also part of ESG requirements for financing.	• Initiate actions to start measuring, monitoring and reporting carbon emissions. • Collaborate and share knowledge amongst private sector to build overall industry capacity in carbon accounting and reporting.	• Require public listed companies to disclose carbon emissions in their annual reporting, starting with scope 1 and 2, and subsequently scope 3. • Bursa should require all quoted plantation companies to move towards full compliance with the Task Force in Climate Related Financial Disclosure within the next 2 years.

Policy recommendation 4: Enhance legislation and frameworks

7 Revisit the supply chain by integrating the role of middlemen

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Performance in terms of sustainability and yields of smallholder may be difficult to be integrated for monitoring and reporting. • The numbers and organisation of smallholders may result in necessary policies and frameworks not reaching to smallholders effectively. • The existence of middlemen in the supply chain may obfuscate the supply chain by making it difficult for stakeholders to reach to smallholders. • Middlemen may manipulate prices or impact the quality of yields.	• Since the middle-man is close to the smallholder and data, encourage middle-man for data reporting and sustainability activities as part of procurement requirements from companies.	• Integrating the role of middlemen in the supply chain by requiring certain obligation and responsibility and providing certain advantages. • Consider regulating and providing certain licenses to the middlemen.

7 Telecommunications sector

Acknowledgement of Roundtable Participation

Telecommunications sector

This report has been prepared through engagement and consultation with the following ministries, agencies and associations.

Contributors

- TM Group
- Digi
- Celcom Axiata
- Maxis
- UMobile
- TIMEdotcom

Moderator

- Dr. Gary Theseira, Malaysian Green Technology and Climate Change Centre (MGTCCC)

Malaysia's telecommunication sector actions towards accelerating climate transitions

Malaysia's information and communication sector is one of the fastest growing sector in the market, and was forecasted to contribute 20% of GDP in 2020 (Source: US International Trade Administration). The sector is significant driver of socioeconomic growth, and the government has included the 5G roll-out and digital economy within the 12th Malaysia Plan. Increasing coverage in a more digital economy has led to increase investments in base stations, which studies have shown to be one of the primary drivers of energy consumption at 57% of the total energy used. Supplying power to off-grid base stations remains a systemic challenge, mainly using diesel generators. The harmful emissions associated with consumption of diesel fuel include carbon dioxide, sulphur dioxide and nitrogen oxides. This in turn causes global warming, the depletion of the ozone layer, cancer, genetic mutations and acid rain.

47% Potential OPEX savings using solar rather than diesel gensets

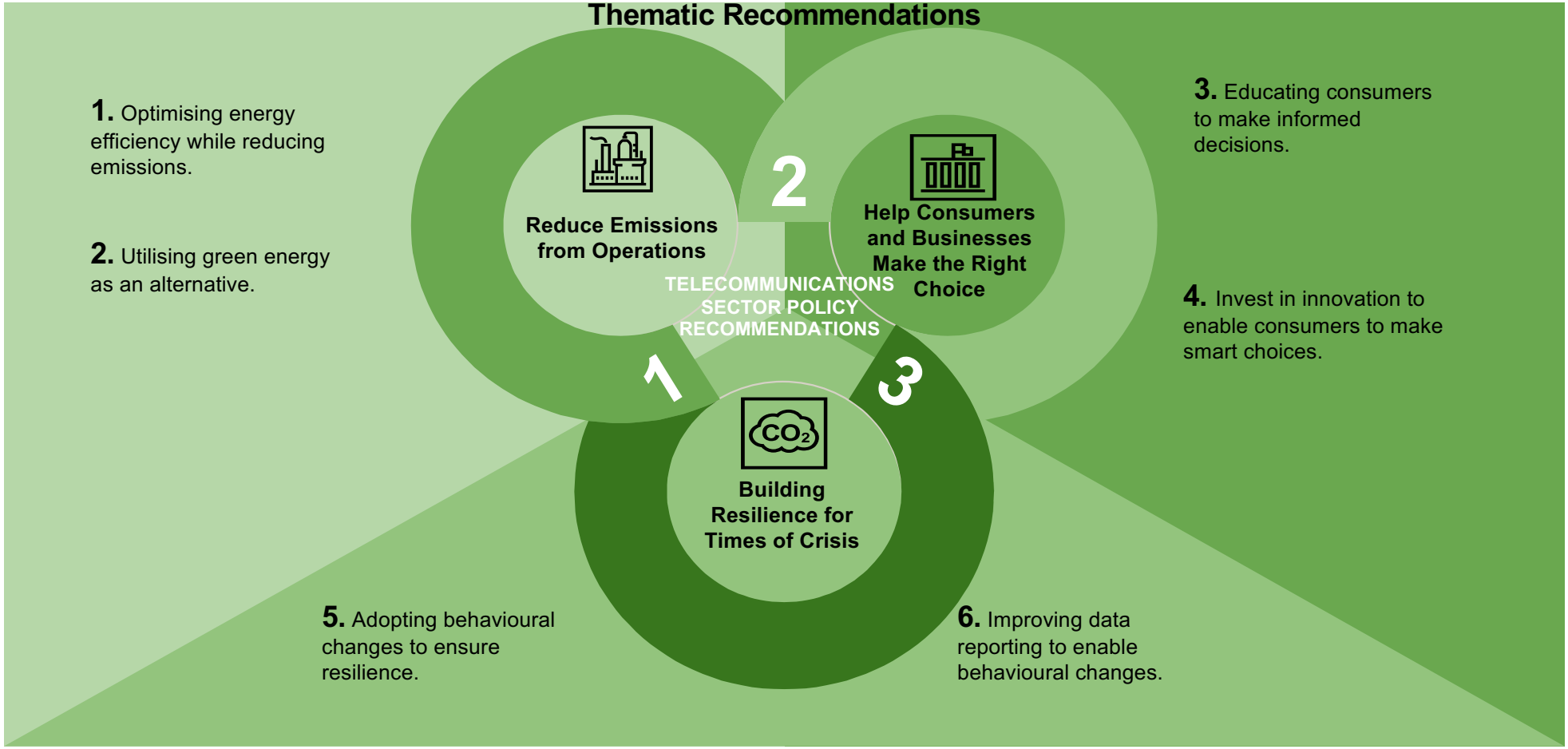
40 kg Annual reduction kg of CO_2 per 1 sqm of solar panel

Common themes emerged from the roundtable engagements, forming the basis of our sectoral recommendations:

- A combination of behavioural changes through energy efficient practices and policy choice such as preference over renewable energies as an energy source would spur the drive to become a net zero sector.
- Educating consumers on sustainable lifestyle should be the focus of both the private sector and public sector.
- Innovation does not only benefit the private sector through energy efficiency and lower costs but also help consumers make the smart choice.
- Driving resilience is a multifaceted commitment which involves both private and public sectors to ensure long-lasting sustainable practices.
- Data capture is important for resilient practices.

Source: US International Trade Administration; Alsharif, Mohammed & Nordin, Rosdiadee & Ismail, Mahamod. 'Energy optimisation of hybrid off-grid system for remote telecommunication base station deployment in Malaysia'.

The telecommunications sector can reduce its own emissions while using its consumer-facing position to increase awareness



Policy Recommendation 1: Reduce Emissions from Operations

1 Optimising energy efficiency while reducing emissions

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Insufficient land to plant the trees that would need to offset emissions. • Transparency of data on emissions from all networks.	• Invest in hybrid sites. For example fiberasation uses less power than microwaves and energy. • Reducing energy consumption with fibre by sunsetting the legacy copper network over a 5-7 year timeframe. Recognise that the country is optimising resources by moving towards single network infrastructure with 5G. • Implement energy efficiency exercises within procurement processes for example prioritising vendors that incorporate greener solutions.	• Mandate smart manufacturing and logistics management in real-time for industries to improve efficiency and reduce waste. • Incentivise usage of energy efficient practices.

Policy Recommendation 1: Reduce Emissions from Operations

2 Utilising green energy as an alternative

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Data centres take most power since the same amount of power needed throughout the day. Cooling may reduce the usage of power slightly. There is no ability to sell back to grid if companies don't need excess energy unlike manufacturing industry.	• Moving into green-related technology and or green sources of energy such as solar or hydro funded from network savings. • Joint sourcing for on-demand generating for better solar capabilities on site (convert gensets to grid - solar panel cannot take 24 hours) - allowing consumers to be connected at site level.	• Encourage investments into green-related technology with aid from incentives and government support.

Policy Recommendation 2: Help Consumers and Businesses Make the Right Choice

3 Educating consumers to make the informed decisions

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Low awareness by consumers on ESG matters- only 40% of consumers who participated in a brand health survey were aware.	• Educate consumers as the industry has leverage to pressure manufacturers to disclose carbon footprint of handsets, so consumers know what they are buying into. Industry can also collaborate on an industry wide e-waste programme to better treat and manage e-waste.	• Facilitate collaboration between telcos and government to provide education and change consumers behaviour on bettering their digital wellbeing and smart connectivity (shy away from an 'always on' lifestyle).

Policy Recommendation 2: Help Consumers and Businesses Make the Right Choice

4 Invest in innovation to enable consumers to make smart choices

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
● Sunset telco operator infrastructure that may have higher carbon footprint.	● Modernising how technology is used for example telco operator services and how to reduce emissions – to continue to modernise to reduce shared carbon footprint. ● Investments in innovations to enable smart cities: ○ Artificial intelligence to organise and manage homes. ○ Access to information for better utilisation of energy. ○ Use of digital technology to improve lives and power used. ○ Enabling internet of things- information readily on mobile and digital solutions to fix the behaviours.	● Government should continue to spur competition which will subsequently spur innovation and better cooperation amongst industry players. Encourage partnership to improve cost efficiency, etc. ● To promote smart home management practices and smart transport planning, providing most efficient use of energy in day to day life.

Policy Recommendation 3: Building Resilience for Times of Crisis

5 Adopting behavioural changes to ensure resilience

Barriers and challenges to accelerate the climate transition

- High capacity data centres are one of the largest GHG polluters. Data centre usage is estimated to 23,000MWh or 12-15% of the grid in next 7 years. Essentially, data centres just convert electricity to heat and have very low thermal efficiency.
- Customers have high expectation on search returns and instant content, resulting in backups into cloud occurring every night, over-providing processing and storage in servers per individual. This will increase energy consumption.
- The shift into 5G will need more semiconductors which will consume more energy and generate more heat.

Private sector contribution to drive the climate transition

- Joint sourcing for on-demand generating for better solar capabilities on site (convert gensets to grid since solar panel cannot take 24 hours). This will allow consumers to be connected at site level.
- Educating and changing consumers behaviour to move away from ‘always on’ / full time Wi-Fi.
- Enhance technology feature such as idle consumer capacity which will send notification to regulators.
- Increase adoption of energy saving initiatives in data centres:
    - Ensure design of data centres are based on green certification.
    - Include features such as renewable energy, rainwater harvesting, smart cooling, energy efficiency.

Government support to accelerate the transition

- Government should maximise the impact of the current utilisation of energy - not creating a new one but ride on existing infrastructure, for example with the adoption of 5G.
- Promote various industries to embrace digitalisation and technology applications, allowing for better connectivity and technology deployment with better resource management capabilities.
- Facilitate collaboration between telcos and government to provide education and change consumers behaviour on bettering their digital wellbeing and smart connectivity (shy away from an ‘always on’ lifestyle).

Policy Recommendation 3: Building Resilience for Times of Crisis

6 Improving data reporting to enable behavioural changes

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Solar power does not harness enough energy to power IT load on data centres. Hence current centres are powered by regenerative batteries. • No specific system that is available to monitor and report on the CO_2 h emission caused by usage of batteries.	• Invest in Energy RMS (Remote Monitoring System) other systems that is available to monitor regenerative batteries. • Consider automated systems that is able to capture, report and regulate energy efficiency of battery performances.	• Promote various industries to embrace digitalisation and technology applications, allowing for better connectivity and technology deployment with better resource management capabilities.

8 Land Use, Land-Use Change and Forestry ("LULUCF")

Malaysia's forests and natural ecosystems is important as a carbon sink and is at risk from overdevelopment

As a country renowned for its mega biodiversity, Malaysia's land use, land use change and forestry (LULUCF) sector is a key differentiating factor towards overall low carbon emissions pathway. Under the national GHG inventory, the LULUCF sector covers emissions and removals of greenhouse gases resulting from direct human-induced land use such as settlements and commercial uses, land-use change, and forestry activities (UNFCCC, 2020). Depending on how LULUCF is utilised, it may impact emissions by increasing emission or alternatively reducing emissions through natural forest sinks which may well help reduce GHG. Malaysia has committed to maintain 50% of land as forest cover in line with the United Nations Sustainable Development Goals. Malaysia currently has 18.27 million hectares of forested areas accounting for 55.3% of the country's land area. However, only 14.23 million hectares are from permanent reserve forest and totally protected areas. The remaining areas can be subjected to development, which may further reduce the forest cover. It is important that Malaysia maintains its forest cover since certain biological assets such as mangroves are highly potent as a carbon sink.

43% Estimated forest cover if only protected forests are considered

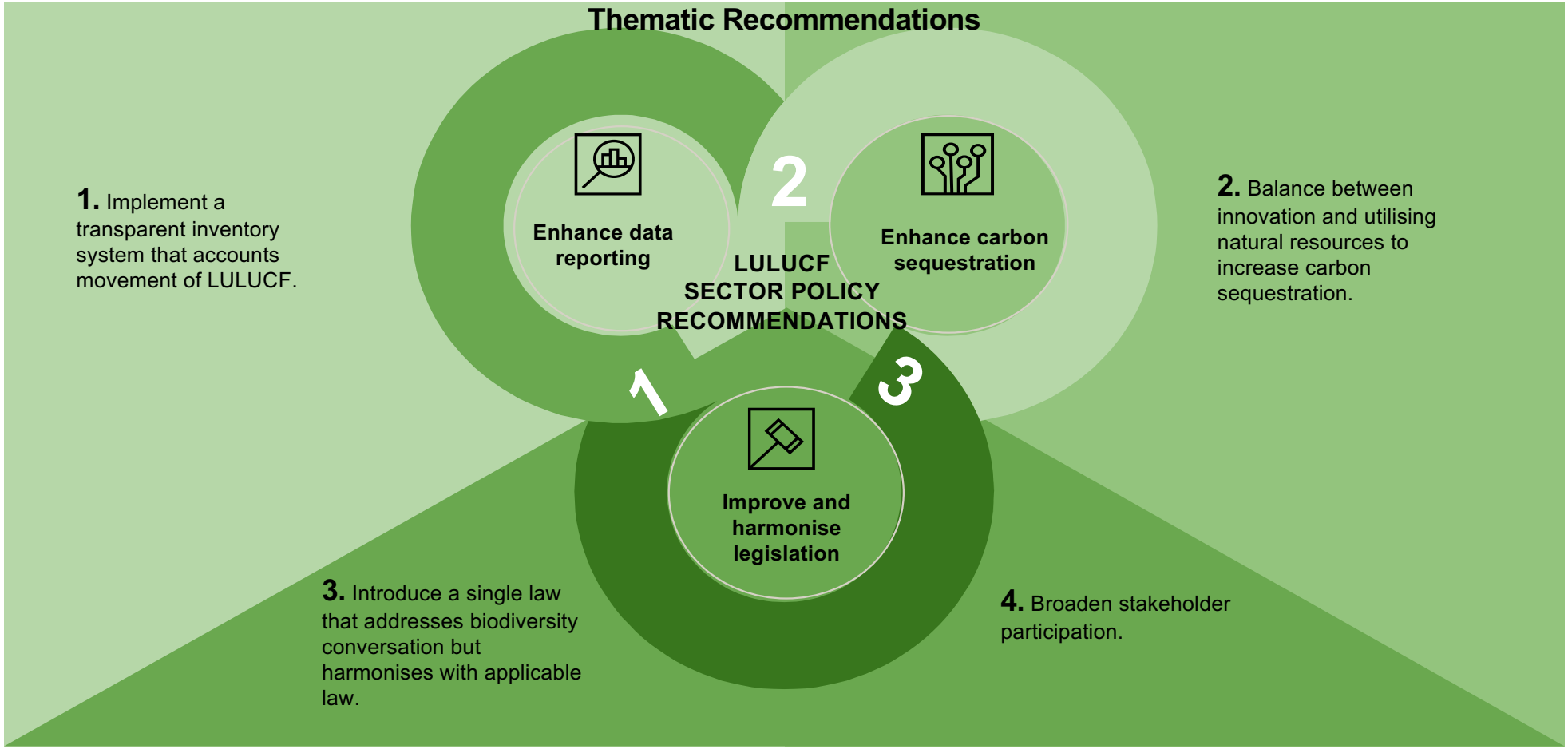
4x How much more mangroves can store carbon compared to other forest

Source: United Nations Framework Convention on Climate Change (UNFCCC); World Wildlife Fund (WWF).

Conservation of Malaysia's carbon sinks have been a common theme across all the sectoral roundtable that was conducted, with various discussions on the need to strengthen protection and sustainable management of forests and natural resources:

- Increase accountability and management of data on LULUCF management and activities.
- Leverage on strengths of existing natural assets for carbon sequestration.
- There should be a single encompassing legislation that seeks to address biodiversity conservation and management as a whole.
- All of government and whole of society should participate in biodiversity conservation especially through use of LULUCF.

Strengthening protection and sustainable management of forests and natural resources will be key to maintain biodiversity while enhancing climate resilience



Policy recommendation 1: Enhance data reporting

1 Implement a transparent inventory system that accounts movement of LULUCF

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Low visibility and accountability by some stakeholders over the reporting of LULUCF inventory data. • Low awareness on what inventory items are considered LULUCF.	• Implement a transparent management system that accounts for the usage and management of LULUCF inventory. • Provide and participate in platforms with government and agencies that seek to address LULUCF management.	• Communicate and develop a management plan for preventing and mitigating the effects of intentional or unintentional carbon reversals (e.g.., harvesting activities, forest fires, insect infestation).

Policy recommendation 2: Enhance carbon sequestration

2 Balance between innovation and utilising natural resources to increase carbon sequestration

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Overdevelopment of LULUCF given the significance of agriculture to Malaysia's economy, resulting in decrease in ability to act as carbon sink. • Insufficient guidance on usage of LULUCF as carbon sequestration.	• Enhance the role of LULUCF as carbon sequester by making sure there is balance development of LULUCF. For example conserving certain land assets as natural sequesters. • Companies may consider retiring certain areas of LULUCF assets and plant with peat or other forestry trees. • Companies minimise use of coastal areas made unsuitable for cultivation due to encroaching salinity or increased flooding due to sea level rise only for renewable energy generation such as installing solar panels. • Adopt the latest carbon sequestration technology along the manufacturing chain.	• Increase public and private partnership in research and use of carbon sequestration technology. • Provide guidance on coastal management policy especially to companies with LULUCF in coastal areas. • Gazette and increase the area of certain natural assets that have been proven effective for carbon sequestration. For example, Malaysia has 641,886 ha of Mangroves and studies have shown mangroves can store carbon up to 4 times more than other tropical forests.

Policy recommendation 3: Improve and harmonise legislation

3 Introduce a single law that addresses biodiversity conversation but harmonises with applicable law

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Piecemeal laws such as Protection of Wildlife Act 1972, National Forestry Act 1982, Fisheries Act 1985, and Land Conservation Act 1956 (revised 1991) have very specific and different objectives. There is no single uniform legislation that addresses biodiversity conservation and management. • No specific legislation and regulations singularly address the ecological dimensions of mangroves management.	• Track and monitor the supply chain and usage of LULUCF to ensure the reporting of data to relevant government agencies.	• Create and adopt in parliament a single comprehensive legislation that addresses biodiversity conservation and management. • Empower monitoring agencies and ensure consistency and transparency in reporting and measurement of compliance.

Policy recommendation 3: Improve and harmonise legislation

4 Broaden stakeholder participation

Barriers and challenges to accelerate the climate transition	Private sector contribution to drive the climate transition	Government support to accelerate the transition
• Parliament effect laws for the whole or any part of the Federation while the State Legislature may make laws for the whole or any part of that particular State. This may result in inconsistency in objective in laws. • Natural resource matters are under the purview of state, which may different development goals from the federal. • Balancing between development goals and conservation especially in the context of maintaining forest cover.	• Commit a portion of available LULUCF for biodiversity conservation to act as a carbon sink to balance emission released by economic production. • Companies may adopt policies and guidelines in management, conservation and preservation of LULUCF assets and reserves to ensure sustainable development of assets.	• Encourage state participation in biodiversity legislation since natural resources are within states jurisdiction. This will ensure any enactment of parliament laws are within the bounds of distribution of powers between federal and state while also being consistent with applicable state laws. • Gazette more LULUCF or land to be classified as protected forests. • Consider minimising or prohibit the development of mangroves in coastal areas. • Provide supervision and policy in guidelines in the management, conservation and preservation of LULUCF and reserves, which can also be adopted by private sector for sustainable development.

9 Acknowledgement & Appendices

Acknowledgement

Appreciation of thanks and acknowledgement of support

Supporting organisations

- Dr Gary William Theseira, Malaysia Green Technology and Climate Change Centre (MGTCCC)
- Dato Mohammad Faiz Azmi, PwC Malaysia
- Marina Che Mokhtar, PwC Malaysia
- Alizan Mahadi, Institute for Strategic and International Studies
- Lavanya Iyer, WWF Malaysia
- Nadir Ahmad, Boston Consulting Group
- Joel Kwong, Boston Consulting Group
- Datin Sunita Rajakumar, Climate Governance Malaysia

Energy and Transport sector

Federal ministries

- Ministry of Environment and Water (KASA)
- Ministry of Transport (MOT)
- Ministry of Energy and Natural Resources (KeTSA)

Federal Agencies:

- Malaysia Green Technology and Climate Change Centre (MGTCCC)
- Energy Commission (EC)
- Sustainable Energy Development Authority (SEDA)
- Malaysia Automotive Robotics and IoT Institute (MARii)

Industry

- Petronas
- Shell
- Tenaga Nasional Berhad
- Boston Consulting Group
- Bursa Malaysia
- PwC Malaysia

Other bodies

- World Bank
- ISIS
- Sunway University
- Rimba

Acknowledgement

Appreciation of thanks and acknowledgement of support

Property and Construction sector

Federal Ministries

- Ministry of Housing and Local Government (KPKT)

Federal Agencies:

- Energy Commission (EC)
- Construction Industry Development Board (CIDB)

Associations

- Real Estate and Housing Developers Association (REHDA)
- Master Builders Association Malaysia (MBAM)
- Institute of Engineers Malaysia (IEM)
- Pertubuhan Akitek Malaysia (PAM)
- Association of Consulting Architects Malaysia (ACAM)
- Malaysian Institute of Planners (MIP)
- Malaysian Photovoltaic Association (MPIA)

Secretariat:

- Green Real Estate (GreenRE)
- Sime Darby Property Bhd. (SDP)

Other bodies

- Tropical Rainforest and Conservation Centre (TRCRC)
- World Wide Fund for Nature (WWF)
- Cement and Concrete Association of Malaysia (CNCA)
- Malaysian Airconditioning and Refrigeration Association (MACRA)
- Malaysian Society of Heating, Refrigeration and Air Conditioning (MASHRAE)
- Malaysian Association of Energy Service Companies (MAESCO)
- Malaysian Green Building Council (MalaysiaGBC)
- European Chambers of Commerce (EuroCham)

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Plantations Sector

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Appendices

1 Abbreviations and Acronyms

BAS	Building Automation System
BMS	Building Management System
BUR	Biennial Update Report
C02eq	Carbon Dioxide equivalent
COGEN	Co-generation
COP26	26th United Nations Climate Change Conference
EE	Energy Efficiency
GBI	Green Building Index
GDP	Gross Domestic Product
GGBS	Ground Granulated Blast Slag
GreenRE	Green Real Estate
GHG	Green House Gases
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
GTMP	Green Technology Masterplan 2017-2030
HFC	Hydrofluorocarbons
IBS	Industrialized Building Systems
KD	Key Driver / Key Direction under the National Low Carbon Cities Masterplan
KE	Key Enabler under the National Low Carbon Cities Masterplan
LCCF	Low Carbon City Framework and Assessment System
MBPJ	Petaling Jaya Municipal Council
MCCG	Malaysian Code of Corporate Governance
MEPS	Minimum Energy Performance Standards
MyCREST	Malaysian Carbon Reduction and Environment Sustainability Tool
NGOs	Non-governmental Organizations
NPP-3	Third National Physical Plan
NLCCM	National Low Carbon Cities Masterplan
LA	Local Authority
OPC	Ordinary Portland Cement
OSC	One Stop Centre
PFA	Pulverised Fly Ash
PLC	Public Listed Company
PMO	Project Management Office
RE	Renewable Energy
REEM	Registered Electrical Engineering Managers
SME	Small and Medium Enterprises
SCM	Supplementary Cementing Materials
UBBL	Uniform Building By-laws of Malaysia
UNFCCC	United Nations Framework Convention on Climate Change
WtE	Waste to Energy

Appendices

2 Roundtable output: Energy Sector

Executive Summary

The energy sector accounts for 80% of Malaysia's greenhouse gas emissions and therefore plays a critical role in Malaysia's decarbonisation. Through a series of five roundtable engagements conducted in Jul-Aug 2021, CEO Action Network members engaged a wide range of stakeholders to solicit input on policy recommendations to accelerate the sector's transition to net-zero. While by no means comprehensive, this document attempts to outline key recommendations which have the potential to create significant decarbonisation impact.

The energy sector can accelerate actions towards climate transition by better design, planning and adoption of low carbon technologies to reduce, capture and store carbon emissions. Some of the challenges the sector faces includes entrenched interests, lack of transparency and an uncertain policy environment.

Common themes emerged from the roundtable engagements, forming the basis of our sectoral recommendations:

1) **Ready, long-term policies exist and where this is the case, focus should be on delivery and timely execution** in order to facilitate planning and investment by the private sector, e.g.. the Low Carbon Mobility Blueprint and National Energy Policy. We are encouraged by RMK-12's emphasis on sustainability and green growth (Chapters 8 & 9 under Theme 3: Advancing Sustainability as well as integrated throughout the plan), and urge for focus now to be on swift and robust implementation.

2) The **private sector is ready and able to support the government** by aligning capital investment with government priorities and providing input into policymaking, and can take leadership on key issues to demonstrate positive outcomes (e.g.. carbon capture and storage).

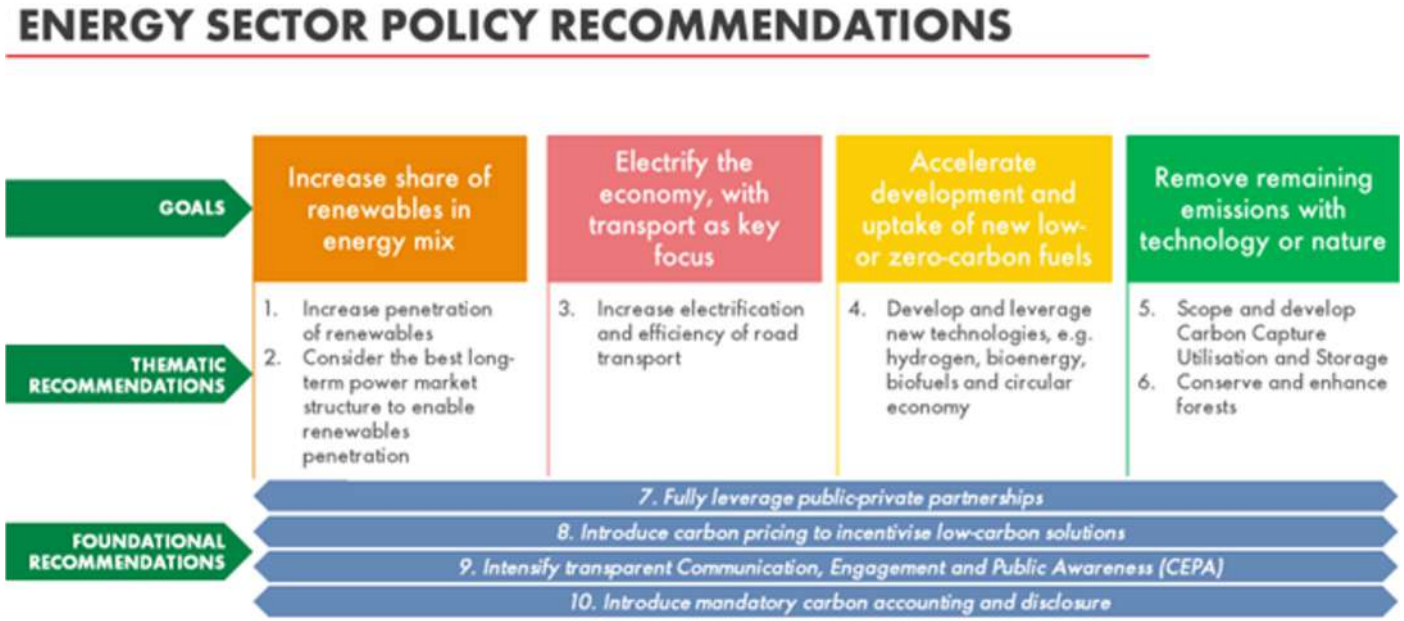
3) Government must **incentivise and facilitate low-carbon solutions** and technologies through tax incentives and other fiscal measures such as carbon pricing and green financing.

Appendices

Roundtable output: Energy Sector

Executive Summary (continued)

4) Public and private sector can **collaborate to facilitate open and transparent engagement** at all levels and with the public to generate momentum for climate action in accordance to international frameworks and standards – adoption of open data, the development of a public



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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
1. Increase penetration of renewables	Grid constraints ● Grid enhancements need to keep pace with Variable Renewable Energy and Large Scale Solar ● Grid constraints, limited controllability and flexibility at high penetrations of distributed solar, particularly in low voltage grids	● Work with government to **align capital investments with government** RE policy ● Initiate capacity building and knowledge sharing across value chain, particularly between large corporates or MNCs and SMEs	● To enable transition to renewables, strong political support, effective policies, and support mechanisms facilitated by policy makers are required. ● Implement overarching **National Energy Policy** to ensure coherent and holistic energy policy decisions which balance trade-offs for overall country benefit, including managing the energy trilemma of equity, security, and environmental sustainability. National Energy Policy should bring together all policies and plans relating to energy production, distribution, and consumption, and bring clarity on overall country priorities for enhancing renewable power generation..	Solve existing challenges such as grid stability and affordability associated with increased renewable penetration Align private sector investment with government RE priorities to achieve better outcomes

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
1. Increase penetration of renewables	Grid constraints ● High distributed solar penetration may lead to potential cost socialization to the wider customer base. This is because when many consumers subscribe to rooftop solar, a review on the payment structure is required which may shift certain cost components to the non- participating customers. [Most customers with rooftop solar PV will continue to be connected to grid and they are not fully self-supplied]	● **Technology innovation**: ○ Private sector has innovations which can help resolve cost and technical challenges in grid stability and affordability, and can support continued innovation to enhance solutions ○ Invest in commercialisation and scale-up of innovations. Both public and private investment in innovation must grow significantly. Innovation support should be coordinated across national governments and international initiatives, and with the private sector.	● **Engage and include private sector/industry** in ○ Policy planning and RE target setting, including input to Planning and Implementation Committee for Electricity and Supply Tariff (JPPPET) of Malaysia ○ Solving cost and technical challenges to advance renewables ○ Encouraging technological innovation to support and encourage the growth of mixed renewable energy resources ● **Incentivise private financing** through market and institutional reform as well as enhancing existing government incentives such as such as the Green Technology Financing Scheme, the Green Investment Tax Allowance and the Green Income Tax Exemption.	Unlock new opportunities through innovation and coordinated public-private investment into emerging technologies

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Roundtable output: Energy Sector

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Thematic Recommendations				
1. Increase penetration of renewables	Policy ● Limited engagement between public and private sector on RE policy. Industry and private sector unclear on government plans, targets and challenges. ● Lack of clarity on priorities for development of renewable energy resources beyond solar, e.g.. hydropower, geothermal, bioenergy	● Install rooftop solar in own buildings	● **Financial support to encourage small and medium scale industries** to develop renewable energy: Government can help from promotion to commercialisation through grants, subsidies or credits. ● Lead by example: Install **rooftop solar** in government buildings ● Further facilitate the growth of RE, especially solar energy for self-consumption, by removing unnecessary regulations or control.	

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Roundtable output: Energy Sector

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Thematic Recommendations				

2. Consider the best long-term power market structure to enable penetration of renewable energy/greener generation	• Electricity market design: price signal distortion may occur when adding renewables to a power market designed for traditional resources, therefore requiring market reforms by the government.	• Work with government to **align capital investment plans** with market liberalization priorities
		• **Technology innovation**:
		  ○ Private sector has innovations which can help resolve cost and technical challenges in grid stability and affordability, and can support continued innovation to enhance solutions
			• **MESI 2.0 reform initiatives** that were announced in 2019 are currently being reviewed in the wake of COVID-19 pandemic, economic challenges and change in government. The Government has indicated that the reform is now aimed to:
			  • Focus on human aspects and being people friendly, ensuring the well-being and interest of the people are taken care of.
			  • Be in line with the government priorities to focus on reviving the economy post-COVID 19 pandemic.
			  • Able to face future challenges and future-proofing MESI without changing the existing industry structure
			• **More engagement with industry and private sector** in co-creating solutions on energy trilemma, particularly on technical challenges for affordable solutions.
				Greater independence in the market model would enhance transparency and create a level playing field
				
				Decentralised generation supports a prosumer environment
				
				Entry of smaller, more independent renewables players into generation and retail of electricity - competition will drive the growth of renewables.

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
2. Consider the best long-term power market structure to enable penetration of renewable energy/greener generation	• Decentralization of the power sector: Introduction of Third-party Access (TPA) to grid infrastructure is challenging as the grid needs to support a high number of generators (distributed generation), accommodate a diversity of generation technology (e.g.. renewables), and integrate new technologies (smart meters, battery storage, electric vehicles, etc).	• **Technology innovation**: ○ Invest in commercialisation and scale-up of innovations. Both public and private investment in innovation must grow significantly. Innovation support should be coordinated across national governments and international initiatives, and with the private sector.	• **Technology innovation**: ○ Refresh innovation priorities to address new challenges of integrating high share of renewable power and increased electrification of end-use sectors, e.g.. transport, industry, buildings. ○ Emerging technologies such as digitalisation, local and grid-scale energy storage, EV smart charging, wider utilisation of mini-grids, etc will be crucial. ○ government to fund research that will create a pipeline of innovations, the best of which the private sector can refine and ultimately bring to market	Democratisation of energy - consumers and suppliers have freedom of choice.

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
2. Consider the best long-term power market structure to enable penetration of renewable energy/greener generation	• Retail market: how to reform the retail segment to allow for greater price differentiation and greater consumer choice, and how to reform commercial and industrial tariffs to encourage more efficient energy consumption. This allows customers to respond to price signals and encourages power producers to be more efficient.		• To ensure system reliability & power affordability, Single buyer & Grid System Operator (GSO) to continue to lead strategic, long-term integrated system planning to encourage generation investments to meet demand and the RE target, reduce surplus margin and manage investments in transmission & distribution.	

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
3. Increase electrification and efficiency of road transport	• Investor hesitation due to low adoption of EV • Lack of EV charging stations due to price gap and market trust • Data gap in terms of availability, accessibility, and transparency related to EV industry • EVs are not cost-competitive compared to ICEs • Lack of clarity and leadership for EV catalysation	With long-terms policy certainty, private sector can • **Strengthen R&D and innovation** to roll out technologies that contribute to adoption of EV (e.g.. battery technology & lifecycle, battery-as-a-service and disposal management) • Expand EV production through **complete knock-down** (CKD) which will also bring down EV price • Private sector and industry players to **collaborate to match supply and demand** of EV and its infrastructure	• **Immediate implementation of Low Carbon Mobility Blueprint** (LCMB) with long-term policy certainty for industry to plan, act and invest • **Enable private sector/industry participation** in policy design, implementation and monitoring • Continuous enhancement of policy based on outcomes and **consultation** with industry, consumers and other stakeholders • Improve **accuracy of data collection** activity and analysis for EV, e.g.. number of EVs sold, infrastructure availability, user charging patterns • **Dedicated funding and financing** scheme for EV supply chain, including for end users • Develop **local EV auto manufacturing** capability • Attract more EV related FDI to partner with local automotive industry to accelerate EV adoption in Malaysia	Minimise air pollution and particulates which helps to improve human health and mitigate climate change Creation of new jobs in the EV industry and ecosystem, supporting transition towards high income nation

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				

4. Develop and leverage new technologies, e.g.. hydrogen, bioenergy, biofuels, and circular economy	• Lack of clarity and cohesive policy direction on priorities for development and implementation of low-carbon technologies
	• Coordination is needed across public and private sectors to align focus areas for technology deployment - private sector typically will not invest in early-stage innovations due to uncertain market potential, government's role is therefore to incentivise or fund basic research
		• **Engage with government** to
		  ○ Understand and align technology development and innovation priorities across public and private sector
		  ○ Share challenges and ideas as well as co-create solutions
		• **Technology innovation**: Invest in commercialisation and scale-up of innovations. Both public and private investment in innovation must grow significantly. Innovation support should be coordinated across national governments and international initiatives, and with the private sector.
			• Implement overarching **National Energy Policy (NEP)** to ensure coherent and holistic energy policy decisions which balance trade-offs for overall country benefit. NEP should bring together all policies and plans relating to energy production, distribution, and consumption, and bring clarity on direction of travel for the country.
			• **Enable ecosystem for technology**:
			  ○ Refresh low-carbon innovation priorities taking into account need to enhance existing solutions (e.g.. hydropower, solar) as well as develop new ones (e.g.. hydrogen, bioenergy).
			  ○ government to fund research that will create a pipeline of innovations, the best of which the private sector can refine and ultimately bring to market and encourage a value chain approach across the energy sector.
				Align public and private sector investment into low-carbon technology innovation and deployment in order to achieve better outcomes
				
				Diffuse costs of R&D between public and private sector

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
4. Develop and leverage new technologies, e.g.. hydrogen, bioenergy, biofuels, and circular economy	• Slowing progress in areas such as hydrogen and biofuels development		• **Engage with private sector** to ○ Plan and set targets as part of innovation cycle ○ Encourage technological innovation to support and encourage the growth of low-carbon technologies, in line with country priorities – including engagement on appropriate incentives for investment ○ Engage in international climate diplomacy to facilitate technology and best practice transfer	

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How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
5. Scope and develop Carbon Capture and Utilisation (CCU) alongside Carbon Capture and Storage (CCS) industry	• Lack of understanding and data on the value of Carbon capture utilisation as well as storage (CCUS) to Malaysia, including potential for both deployment and their contribution to Malaysia's decarbonisation agenda as well as economic development • Country's CCUS potential requires further appraisal to de-risk storage potential of identified fields and other formations. At this stage, the most advanced CCUS opportunity in Malaysia is only at conceptual study phase – the Kasawari Phase 2 project.	Collaborate with government to • **Sponsor a study of the CCUS opportunity** in addressing emissions in the Energy sector in Malaysia, including development of a roadmap for the scale-up and roll-out of CCUS at scale. • Formulate a **national Carbon Capture and Utilisation (CCU) alongside Carbon Capture and Storage (CCS) strategies**	Work with industry to • **Design and implement policies** and regulations to enable, incentivize and accelerate deployment of CCUS based on the national strategy and roadmap. • **Consider best practices** from other countries for applicability to Malaysia, including ○ *Assess and manage risks and opportunities*: (i) at minimum, assessment is needed in the areas of permitting & licensing, long-term CO2 liability, operational standards, and monitoring and verification; (ii) consider areas to enable cross border CO2 transport, which could create economies of scale, earn foreign income and realise Malaysia's potential as a regional storage hub. Potential to leverage alliances/treaties with ASEAN and others to broaden the CO2 market and accelerate global goals in achieving NZE.	Reduction of GHG emissions in energy production; Decarbonisation of industrial and other hard to abate sectors Position Malaysia as a competitive and strategically located CO2 storage hub within South China Sea which can accelerate regional decarbonisation goals

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
5. Scope and develop Carbon Capture and Utilisation (CCU) alongside Carbon Capture and Storage (CCS) industry	• Malaysia does not currently have any regulations or policies that govern CO2 emissions or/and CCUS		• **Consider best practices** from other countries for applicability to Malaysia, including ○ *Sustainable financing*: potential forms of financing to incentivize CCS investments including tax incentives, public procurement of CCUS system and issuance of carbon credits from verified carbon storage, amongst others • **Promote public awareness** of the safety, cost & technical feasibility, decarbonization and economic value of CCUS as part of the overall national narrative to unlock lower carbon energy solutions	Retain and grow high value jobs and encourage foreign direct investment Over 49 years of storage potential of up to 425 MtCO2 within the 200km radius from onshore Bintulu (not inclusive of saline aquifers or other geologic formations)

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Roundtable output: Energy Sector

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Thematic Recommendations				
6. Conserve and enhance forests	• The value of ecosystem services provided by standing forests is not accounted for in current economic thinking – forests are worth more to state governments cut down than left in place • State governments face pressures to generate income – clearing forests for logging, mining, forest and oil palm plantations are traditionally reliable sources of income. Challenge is balancing the economic incentive vs long-term impact of deforestation	• **Invest in forest protection** via carbon financing/nature-based solutions as part of decarbonisation ambition, abiding by emissions hierarchy of *avoid, reduce, compensate.* • Working directly with state governments and NGOs on the ground, private sector can **offset the opportunity costs of forest conservation** for state governments, as well as **diffuse project risks** for NGOs and state governments	**Redefine value of forests** • Value of forests must be considered holistically, e.g.. value of freshwater, oxygen, carbon storage. As a start, the costs of continued deforestation should be examined and accounted for, e.g.. infrastructure damage from flooding caused by forest lost. • Other countries and private sector entities are already reframing the conversation to take into account environmental and social dimensions of development, e.g.. ESG conditions in financing, carbon border adjustment mechanisms. The framework to understand and implement already exists (we don't have to recreate) and Malaysia risks being left behind if it does not also progress in parallel	Coordinated forest conservation efforts between federal, state and private actors Reduce perverse incentive for state governments to cut down forests instead of preserve them Better understanding of and accounting for value of ecosystem services provided by forests

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Thematic Recommendations				
6. Conserve and enhance forests	• Climate change policies are implemented at a federal level but land and forest matters fall within the jurisdiction of state governments, resulting in misalignment of priorities and actions	• However, to enable private sector investment, clear policies are required to enable participation in the international voluntary carbon market, in the absence, currently, of a domestic carbon market	**Harmonise federal and state priorities** • Enacting climate policy at state government level should be a primary focus, building on federal level policy priorities • Existing mechanisms for federal-state consultation should be expanded to include climate matters • State level climate policy should account for the protection of forests as carbon sinks • By RMK-13, all states to institute a public consultation process before any deforestation project	Enhanced ESG credentials which can enable further private and international financing

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Foundational Recommendations				
7. Fully leverage public-private partnerships **Alluded to in each point above but its importance warrants a standalone recommendation*	• Limited engagement on government policy and plans currently occurs between public and private sectors • Governments cannot (and should not) bear the costs of the energy transition on their own, but private sector needs long-term policy certainty to make investment decisions • Transition to a net-zero economy is complex with many interconnections that require all parts of society to move in step with one another	• Private sector can help to diffuse risks and costs to government by aligning investments with national decarbonisation priorities • Private sector should organise themselves in a way which facilitates open and transparent industry engagements with government at multiple levels, e.g.. through CAN, industry associations • Engage constructively with government to bring ideas and challenges up for discussion	• Adopt inclusive, open engagement across policymaking and implementation to facilitate participation of private sector – this can create clarity in direction, sense of ownership, and more robust policy outcomes in capturing value from low carbon growths through a chain approach across the energy sector. This is crucial in safeguarding livelihoods and managing a just transition. • Set clear and long-term priorities which private sector can align plans and actions against	Coordinated efforts across public and private sector to drive better policymaking and outcomes Shared risks and costs of decarbonisation between public and private sector Private sector can take ownership and leadership in identified areas in support of government priorities, e.g.. low-carbon technology research and deployment

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Foundational Recommendations				
7. Fully leverage public-private partnerships **Alluded to in each point above but its importance warrants a standalone recommendation*	• Specific challenges exist in increasing renewables penetration, deploying new low-carbon technology and protecting forests - private sector can help but cannot do so without open engagement			

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Foundational Recommendations				
8. Introduce carbon pricing to incentivise low-carbon solutions	• Malaysia has utilised numerous policies to lower emissions since 2000s but these fragmented, command-and-control approaches have not led to systematic decarbonisation in Malaysia	• Support government efforts to introduce carbon pricing • Adopt **shadow pricing** as in interim solution, before the introduction of a carbon price in Malaysia • Adopt practices to **track, monitor and report carbon emissions**, in anticipation of the introduction of carbon pricing • Encourage systematic approach on governance via 3rd party verification in accordance to international standard	**Implementation of carbon pricing warrants a holistic approach with clarity of objectives and understanding of the constraints and implications (such as cost). All parties involved must be clear on the scope of implementation (across all sectors) and have a structured approach and proper public discourse and stakeholder engagements.** The most important first step is to perform a holistic study with a rigorous assessment of benefits and trade-offs.	Levelling of playing field between low-carbon technologies and more carbon-intensive incumbents Creates a source of revenue for the government which can be channelled to low-carbon projects, investments, policies, in turn generating positive multiplier effects on the economy

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Foundational Recommendations				
8. Introduce carbon pricing to incentivise low-carbon solutions	• EU recently announced carbon border adjustment mechanism (CBAM) which will apply to specific industries or sectors, some of which will impact Malaysia, from 2026 onwards – without a domestic carbon price, every dollar or euro or ringgit that is collected by a foreign government based on the carbon content of products produced in Malaysia but exported overseas is revenue foregone for the Malaysian government. Instead of us collecting carbon revenue, the foreign country will.		Consider learnings and best practices from other countries for applicability to Malaysia. This could include • Starting with the energy and transport sectors which encompass the bulk of Malaysia's total GHG emissions. • Adopting a **gradual approach** to maximise social acceptance and minimise economic and political risks – price of carbon can be introduced at a relatively low rate (e.g.. USD 5/tonne) but gradually increasing over time. • Implementation should account for and **address potentially regressive direct effects**, particularly on the B40 segment of society. • Carbon revenue should be paid into a **dedicated climate change fund** and be redistributed to ○ Address cost-of-living impacts to the B40	Enhanced economic incentive for innovation and development of low-carbon technologies Incentivise businesses and consumers to make low-carbon choices Sidestep the issue of Malaysian exports subjected to CBAMs at foreign borders

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Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Foundational Recommendations				

8. Introduce carbon pricing to incentivise low-carbon solutions	• Introducing a carbon price can be challenging due to lack of public awareness and understanding of carbon pricing – its goal, benefits, challenges and how regressive impacts can be addressed
	• May result in increased costs to end consumer and outsized impact on the B40 segment
			• Carbon revenue should be paid into a **dedicated climate change fund** and be redistributed to
			  ○ Provide funding for climate change mitigation and adaptation
			  ○ Improve national GHG inventory management
			  ○ Upskill and reskill Malaysians, especially youth
			• In the interim, while designing an adequate carbon pricing regime, **shadow pricing** should be introduced to raise awareness of the cost of carbon emissions and make it easier to introduce a price on carbon later.
			• Initiate broad **public engagement** to address concerns and build support for carbon pricing, with a view of introducing it in near future (to support our pledge during Paris agreement COP21)	

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Foundational Recommendations				
8. Introduce carbon pricing to incentivise low-carbon solutions			• **Transparency** in distribution of carbon revenue – a dashboard that tracks how much funds have been collected and how the funds are used should be considered (see point 9) • Consider ASEAN linkages to increase liquidity • Reduce existing market distortions, e.g.. the fuel subsidy. Funds saved can be used for more targeted aid to B40 households.	

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Foundational Recommendations				
9. Intensify transparent Communication, Engagement and Public Awareness (CEPA)	• Understanding of climate change is low, especially at the level of state government and non-urban communities • This results in inaction and no sense of "ownership" of the problem and solutions - the transition to net-zero is complex and requires all parts of society to move in step with one another	• Private sector can **work with government** to shape and rollout public engagement initiatives on Malaysia's net-zero journey – e.g.. CAN and the government can collaborate on an annual programme to solicit stakeholder feedback as well as public opinion as input to government	• Adopt **open data** • **Collaborate with private sector** on key public engagement initiatives, starting with the design of a web-based dashboard which tracks our progress against key metrics in Malaysia's decarbonisation journey • Make climate change material more **accessible**, e.g.. communicating in different languages and via channels accessible by state governments and local communities • Behavioural change at all levels requires new ideas and collaborations, e.g.. bring together psychologists, behavioural scientists and communicators to seek solutions • Embed energy transition and environmental awareness in education syllabus and awareness campaigns at school and universities to create a climate savvy society	Drive action and ownership at all levels – Individuals, local communities, local and state governments, private entities

Appendices

Roundtable output: Energy Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Foundational Recommendations				
10. Introduce mandatory carbon accounting and disclosure	• Designing effective decarbonisation roadmaps and tracking progress against them requires an effective monitoring, reporting and verification carbon accounting process – there are no current requirements for corporate carbon reporting • Standardised carbon accounting is also required as a precursor to any carbon tax or carbon trading schemes • Carbon disclosures also form part of ESG requirements for financing	• Initiate actions to **start measuring, monitoring and reporting** carbon emissions • **Collaborate and share knowledge** amongst private sector to build overall industry capacity in carbon accounting and reporting • Leverage international framework and standards for reporting and disclosure	• **Require public listed companies to disclose carbon emissions** in their annual reporting, starting with scope 1 and 2, and subsequently scope 3. • Provide **support and capacity building** for companies to track, measure and report emissions data	Comprehensive quantification of carbon emissions can enable Malaysia to transition from incentivising climate actions, to imposing penalties for non-compliance of reduction targets, and finally implementing carbon taxation of carbon footprints

Appendices

3 Roundtable output: Property and Construction Sector

Executive Summary

As a signatory to the Paris Accord, Malaysia has committed to a national GHG emissions intensity reduction target of 45% by 2030 from 2005 levels. The 3rd National Physical Plan (NPP-3) targets a 50% reduction in national emissions intensity by 2040 and this is reflected in plans for sustainable infrastructure and the development of low carbon cities. 90% of Malaysia's population is estimated to be living in cities by 2050. The property and construction sector contributes approximately 40% of Malaysia's carbon footprint encompassing emissions throughout its lifecycle. Further, two-thirds of the building area that exists today will still exist in 2050 necessitating upgrades and retrofitting to lower their carbon impact.

Can these targets be achieved? Should Malaysia set more ambitious absolute GHG reduction targets? Should Malaysia set a net zero target by 2050?

These were some of the key questions deliberated in a series of roundtables organized by CAN and CGM to engage stakeholders in the property and construction towards steering policy action. Four (4) topical roundtables were held as follows:

- Roundtable #1 – Reducing Embodied Carbon in the Built Environment held on the 12th of July 2021. Link to blogpost - https://www.cgmalaysia.com/post/we-can-halve-embodied-carbon
- Roundtable #2 – Reducing Operational Carbon in the Built Environment held on the 16th of July 2021. Link to blogpost - https://www.cgmalaysia.com/post/round-table-property-sector-second-session
- Roundtable #3 – Improving Resilience and Minimizing Ecological Damage held on the 19th of July 2021. Link to blogpost - https://www.cgmalaysia.com/post/round-table-property-sector-third-session
- Roundtable #4 – Conversation with Ministry of Housing and Local Government (KPKT) held on the 27th of July 2021. Link to blogpost - https://www.cgmalaysia.com/post/round-table-property-sector-fourth-session

Appendices

Roundtable output: Property and Construction Sector

These roundtables highlighted the need for a clear, long-term national roadmap towards lowering GHG emissions – 2050 and beyond. In tandem - enhanced regulations, improved governance and targeted incentives were the top three (3) recommendations to rapidly drive the private sector towards lowering their GHG emissions

Policy Recommendations

CAN and CGM fully endorse the low carbon pathways, action and implementation plans outlined in the National Low Carbon Cities Masterplan (NLCCM), 1st edition 2021. We highly recommend that this plan is applied as soon as possible**.** The policy recommendations being put forward in this report are intended to augment the NLCCM in specific areas that will be referenced accordingly.

In addition, national reporting on GHG emissions and strategic green targets for the property and construction sectors in Malaysia are referenced from the following documents:

- Malaysia's 3rd Biennial Report (BUR) to the UNFCCC, December 2020
- Green Technology Masterplan Malaysia (GTMP) 2017-2030

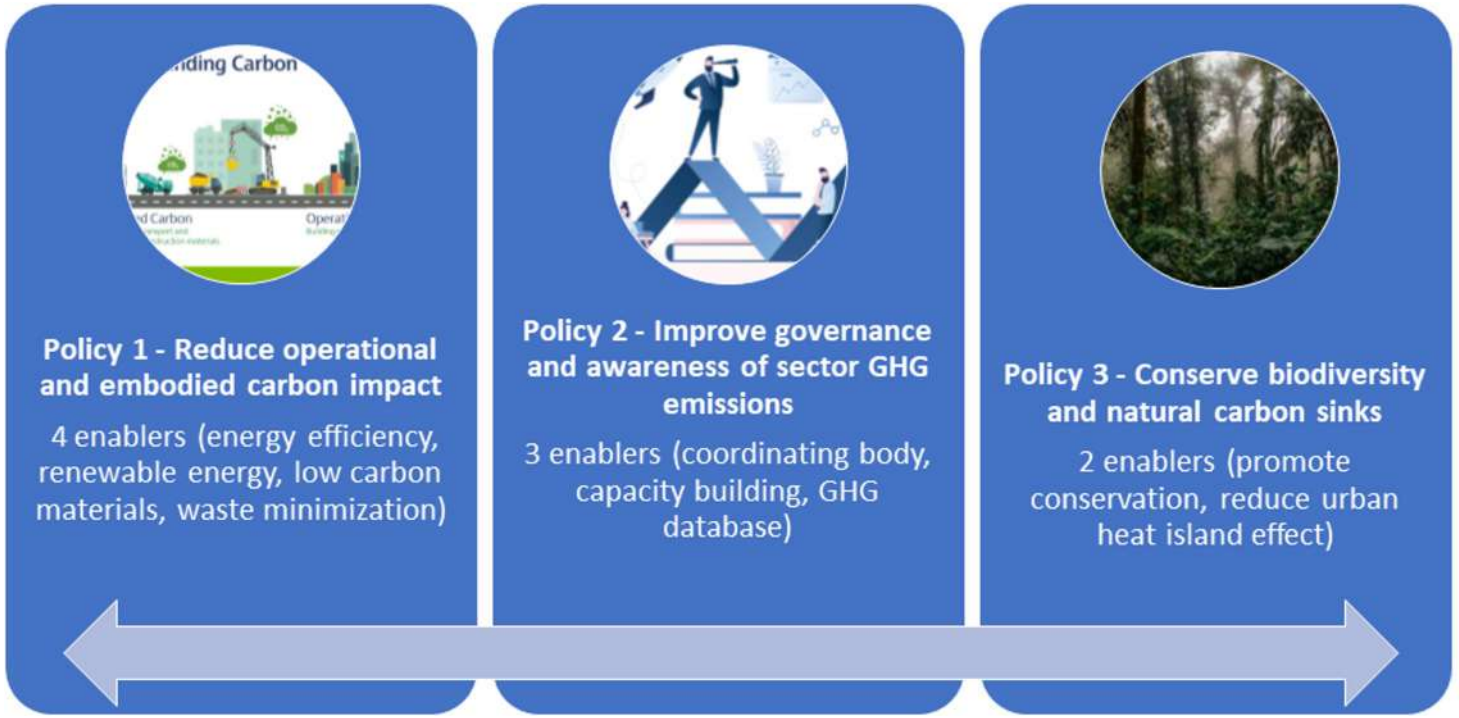
This report describes the three (3) policy proposals and nine (9) enablers being put forward by CAN and CGM as an outcome from the roundtable sessions held.

Appendices

Roundtable output: Property and Construction Sector

Policy Chart

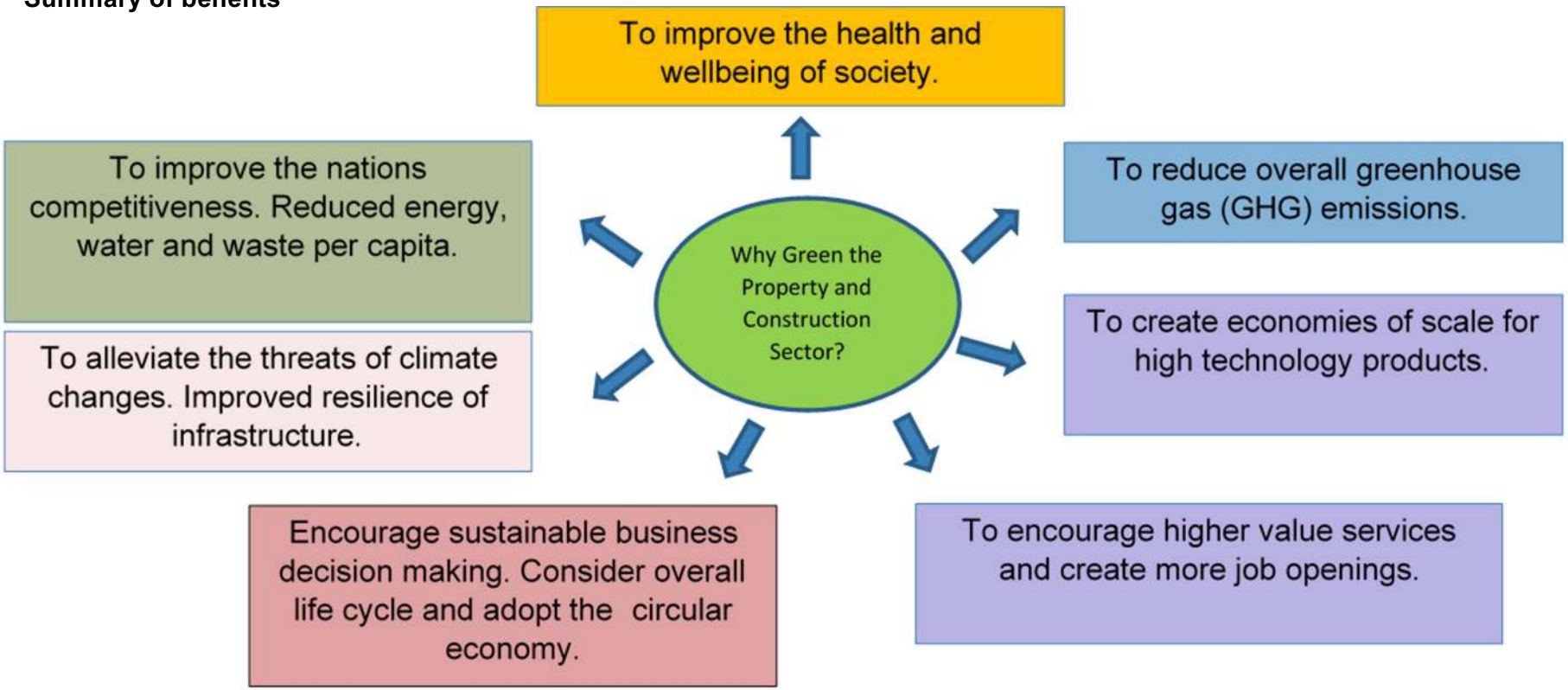
The three (3) policy recommendations and nine (9) supporting enablers are summarized as follows:



Appendices

Roundtable output: Property and Construction Sector

Summary of benefits



Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Energy efficient design for new buildings	Regulations that mandate energy efficiency considerations have not been passed. Insufficient incentives to drive adoption of EE improvement measures.	To implement requirements of UBBL-38A in all new projects. The impending Energy Efficiency and Conservation Act (EECA) will provide the legal framework for private sector compliance to energy efficiency targets.	**Reference: NLCCM KE3 – KD9.2** 1. Energy Efficiency and Conservation Act (EECA) to be enacted immediately. Medium to long term EE targets to be set i.e. 2030 – 2050. **Action By: Federal** **Timeline: < 1 year** 2. Establish a dedicated building sector EE Regulation under the EECA with mandatory EE Building Codes for new buildings. Set target for 40% improvement in the baseline of Building Energy Intensity (BEI) from MS 1525:2019 by 2030. **Action By: Federal, State, Local Authorities** **Timeline: < 1 year**	75 million sqm of new commercial buildings area by 2030 with 30% savings in energy intensity. Savings of **6.5million tonnes of CO2eq annually.** Increased job openings for qualified engineers and technicians. – STEM sector. Increase economies of scale for technologically efficient equipment in Malaysia.

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Energy efficient design for new buildings (continued)		.	**Reference: NLCCM KE3 – KD9.2** 3. Enforce amendment to UBBL - clause38A (OTTV, RTTV and roof u-value) across whole of Malaysia at local authority level. This has been gazetted in three states namely Selangor, Penang and Terengganu. However, implementation and enforcement at local authority level is lacking. **Action By: Federal, State, Local Authorities** **Timeline: < 1 year** 4. Promote and mandate suitable tropical green building certification and rating (minimum Silver certified – from established local certification bodies i.e. GreenRE, GBI or MyCrest) for all new buildings >2000m2 (all sectors – residential, commercial, healthcare, retail and hospitality). This will ensure appropriate integration of passive and active design features.	75 million sqm of new commercial buildings area by 2030 with 30% savings in energy intensity. Savings of **6.5million tonnes of CO2eq annually.** Reduction of water and power infrastructure requirements at state / la. Job creation and economic activity. Creating a domestic market for high tech equipment**.**

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Energy efficient design for new buildings (continued)		.	**Reference: NLCCM KE3 – KD9.2** GTMP has set a target of 1,750 green buildings by 2030 (currently less than 250 buildings). This target should be revised to 20% of building stock in Malaysia by GFA in Malaysia by 2030. (4% as of 2020) 5. Incentives: • Provide income tax exemptions to all developers for developing and sale of green-certified buildings – residential and commercial. **OR** Alternatively, widen the scope of the existing project investment tax allowance currently administered by MIDA by extending the income tax allowance (ITA) to the developer of residential and strata commercial titled buildings of the discounted value of the incremental green cost.	

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Energy efficient design for new buildings (continued)		.	**Reference: NLCCM KE3 – KD9.2** 5. Incentives (continued): • Continuation of the existing Green Technology Tax Incentives under MIDA/MGTC beyond 2023. . These incentives should be approved in blocks of 10 years to provide certainty to property developers as typical building projects take between 5-6 years from concept through to completion. • State Gov / LAs to give incentives such as higher plot ratio or density for projects with Gold / Platinum green certification.	

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Energy efficient design for new buildings (continued)		.	**Reference: NLCCM KE3 – KD9.2** 5. Incentives (continued): • State Gov / LAS to lower compliance costs and/or development charges to encourage wider adoption of green buildings. (e.g. 10% Assessment rate reduction for first 3 certification years, two thirds (2/3) development charge rebates returned in 3 stages, stage 1 at CCC and green certification, stage 2 on 2nd year and stage 3 on third year for gold or platinum green buildings achieving 30-50% EE) The rationale being that green-certified buildings will use less utilities, require less infrastructure and generate less waste. • Excise duty and sales tax exemption for all green labelled / certified building materials. **Action By: Federal, State, Local Authorities** **Timeline: < 1 years**	

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Improve energy efficiency in existing buildings	Lack of incentives Lack of awareness. Poor promotion of available investment tax allowances.	Implement advanced building management processes and systems to improve EE. The Energy Efficiency and Conservation Act (EECA) will provide the legal framework for private sector compliance to energy efficiency targets.	**Reference: NLCCM KE3 – KD9.2** 1. Establish a dedicated building sector EE regulation under the EECA with mandatory EE building codes for existing buildings. Set suitable baseline building energy intensity in accordance to MS-1525:2019 and in alignment to long term EE targets as part of EECA. Initial focus to be on commercial buildings older than 15 years as follow: 2. Mandatory energy audits / energy management audits to check compliance to proposed regulations every 5 years. 3. All buildings with centralized HVAC systems to incorporate Building Automation System (BAS) / Building Management Systems (BMS) to track and control performance of chiller system.	100 million sqm of existing commercial buildings> 15 years. 30% savings in electricity will result in 3.9 million tonnes CO2eq savings by 2030. Increased in job openings for qualified engineers and technicians. Increase economies of scale for technologically efficient equipment in Malaysia.

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Improve energy efficiency in existing buildings (continued)			**Reference: NLCCM KE3 – KD9.2** 4. Mandatory upgrade of chiller plant for buildings with centralized HVAC systems not meeting performance benchmarked to MS 1525:2019. 5. REEM auditors to ensure compliance to 30% minimum EE savings target. 6. Promote the Energy Performance Contracting (EPC) form of retrofitting by ESCOs. 7. Existing buildings to phase out HFC based refrigerants by 2026. **Action By: Federal** **Timeline: <1 year**	

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Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Improve energy efficiency in existing buildings (continued)			**Reference: NLCCM KE3 – KD9.2** 8. Incentives: • Building energy audits to be eligible for double tax deduction which will encourage building owners to benchmark their active systems and identify appropriate elements to be upgraded. • Building tenants' rental payment to be eligible for double tax deduction and landlords' rental income to be tax exempt through application of green leases in green building certified projects. • Widen the database of MyHIJAU listed Energy Efficient (EE) equipment eligible for investment tax allowance. Automatic reciprocal recognition of products already certified under established foreign green labelling / certification schemes. Automatic inclusion into MyHIJAU database based on performance-based metrics of EE equipment with minimum 30% improvement benchmarked to MS-1525:2019.	

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Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 1 – Energy Efficiency

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Improve energy efficiency in existing buildings (continued)			**Reference: NLCCM KE3 – KD9.2** 8. Incentives (continued): • State / local authorities to provide assessment fee rebates for buildings that undertake green building recertification. **Action By: Federal, State, Local Authorities** **Timeline: <1 year**	

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 2 – Renewable Energy

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Adopt solar solutions and energy storage to substitute power procured from grid. Opening of the electricity market	Lack of awareness. No CAPEX incentives for residential customers. The market has also grown at such a pace that it has outgrown and outrun the present guidelines which are based on fossil fuel based generation (e.g.. fault current limitations, quota of 300MW of NEM 3.0 allocated for commercial and industrial sector fully exhausted within 3 months)	Newer constructions can look at integrating solar power solutions at the planning stages to ensure availability of adequate roof space. Banking sector to improve financing options available for rooftop solar. Present PV pricing is good and there is a strong demand from RE100 companies. The market has also indicated that it has the appetite for investment with the right policy consistency in place.	**Reference: NLCCM KE3 – KD9.2** 1. To re-instate 1:1 net metering (NEM) for solar installation and significantly increase available quota. (Currently Residential only 100MW and commercial 300MW). Maintain 1:1 NEM until battery technology gains parity. 2. Staged grid reforms to allow for acceptance of a distributed power generation. 3. Policies and enablers such as Time of Use (ToU) MESI2.0, P2P energy trading and 3rd party access would allow for arbitrage opportunities and the creation of new business models (e.g. energy as a service) to encourage growth in other sectors. 4. Enabling third party access to the grid will allow other types of renewable energy to take part in front of meter (FTM) Corporate PPA arrangement to sell to companies as funding for Feed-in Tariff (FiT) by SEDA comes to an end for these renewable resources.	Potential for buildings that could adopt solar rooftop solutions in Malaysia include: 3.2 million residential houses, 450,000 shop houses, 110,000 factories, 1000 shopping malls and 5000 government buildings. Currently, Malaysia has less than 20,000 buildings with rooftop solar systems. 20GW of rooftop potential in Malaysia. Constitutes 57% of 2021 grid installed capacity in Malaysia.

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 2 – Renewable Energy

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Adopt solar solutions and energy storage to substitute power procured from grid. Opening of the electricity market (continued)		Private sector keeps abreast of the latest solutions and technologies and should be allowed to assist the government to provide cutting edge solutions being used elsewhere with positive results.	**Reference: NLCCM KE3 – KD9.2** 5. Development of grid charges should be transparent and reasonable. Adoption of renewable energy should also include other potential RE such as biogas, biomass etc. **Action By: Federal, State, Local Authorities** **Timeline: <1 year**	

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 3 – Low Carbon Materials

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Increase the use cement replacement in construction - where cement is replaced by industrial by-products and waste materials like pulverized fuel ash (PFA) and ground granulated blast furnace slag (GGBS). PFAs and GGBS cost just half the price of cement.	There is a misguided perception that cement replacement is more costly. The price is comparable to the price of OPC. The codes of practice that is applicable in Malaysia, adequately addresses and permits the use of cement replacement.	Concrete suppliers should make cement replacement available at competitive rates. Products should be made widely available. Developers / consulting engineers to specify application of low carbon mix concrete in projects.	**Reference: NLCCM KE3 – KD9.1, KD9.4** 1. The price of concrete incorporating SCM to replace OPC should not come at a premium to normal concrete for the same application. 2. To introduce statutory requirement for cement replacement with industrial by-products of between 15%-40% in concrete mix by 2023 (PFA/GGBS) for projects in Malaysia. 3. Regulate price of PFA and GGBS supply. **Action By: Federal, State, Local Authorities** **Timeline: < 1 year**	Optimal design with 40% cement replacement (at no additional cost) would lead to a 20% reduction in embodied carbon in reinforced concrete. Approximately 9.7million tonnes CO2eq savings.

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 3 – Low Carbon Materials

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Increase the use cement replacement in construction - where cement is replaced by industrial by-products and waste materials like pulverized fuel ash (PFA) and ground granulated blast furnace slag (GGBS). PFAs and GGBS cost just half the price of cement. (continued)	Cement replacement with supplementary cementitious materials, depending on the quantity and type of supplementary cementitious material (SCM), may or may not affect setting time and early strength gain. Example for 40% replacement of GGBS, compared to 40% replacement of PFA or fly ash, 40% GGBS may not affect the strength as much as 40% replacement of fly ash. Nevertheless, concrete strength can be managed by admixtures and cementitious content. Published guidelines and reference documents show that up to 40% replacement has no or negligible impact.			

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Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 3 – Low Carbon Materials

<table>
<tr><th>How can the sector accelerate actions towards climate transition?</th><th>What are the barriers and challenges that the sector is facing to accelerate the climate transition?</th><th>How can the private sector contribute to drive the climate transition?</th><th>What can the government do further to accelerate the transition?</th><th>Impact</th></tr>
<tr>
<td>Increase the low GWP Refrigerant (GWP < 300) to replace High Global Warming Substance - where natural refrigerant with non-ozone depleting threat and negligible GWP or Refrigerant that Non ozone depleting and GWP less than 300 equivalent impact to CO2 (GWP=1).</td>
<td>There is no better refrigerant to replace existing synthetic refrigerant that causing global warming.
There is a misguided perception that natural refrigerant is highly flammable and dangerous. The codes of practice, including MS2678:2017 that is applicable in Malaysia, adequately addresses and permits the use of flammable refrigerant system including Flammable HFO, Flammable HFC and Natural Refrigerant.</td>
<td>HVAC&R Supplier and Manufacturer should invent more low GWP refrigerant alternative product at competitive price rather than emphasizing energy efficiency improvement but neglect the impact of Super Green House Gas. Products should be made widely available. Developers / Consulting Engineers to specify application of low GWP refrigerant product in projects. Architect design the designated site installation comply to use of low GWP refrigerant product</td>
<td>Reference: NLCCM KE3 – KD9.1, KD9.4
1. Malaysia has ratified the Kigali Amendment for Montreal Protocol on 21st October 2020.

2. Malaysia is Obligated to phase down HFC (GWP>300) based on the baseline as below.

<table>
<tr><th>Year</th><th>Reduction</th></tr>
<tr><td>2029</td><td>10%</td></tr>
<tr><td>2035</td><td>35%</td></tr>
<tr><td>2040</td><td>50%</td></tr>
<tr><td>2045</td><td>80%</td></tr>
</table>
</td>
<td>Types of Low GWP refrigerant (GWP<300)

<table>
<tr><th>Refrigerant</th><th>GWP</th></tr>
<tr><td>R744 (CO2)</td><td>1</td></tr>
<tr><td>R717 (Ammonia)</td><td>0</td></tr>
<tr><td>R290 (Propane)</td><td>3</td></tr>
<tr><td>R600a (Isobutane)</td><td>3</td></tr>
<tr><td>R1234yf</td><td><1</td></tr>
</table>
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Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 3 – Low Carbon Materials

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Increase the low GWP Refrigerant (GWP < 300) to replace High Global Warming Substance - where natural refrigerant with non-ozone depleting threat and negligible GWP or Refrigerant that Non ozone depleting and GWP less than 300 equivalent impact to CO2 (GWP=1). (continued)	There are also false perceptions on the product safety due to uses of flammable refrigerant but green input to HVAC&R. The IECEE/CB scheme, IEC 60335-2-40 enabled the test on Safety of household and similar electrical appliances and comply to Malaysia Electrical Act.		**Reference: NLCCM KE3 – KD9.1, KD9.4** HFC phase-down baseline were projected based on the survey that DOE did under the enabling activities in 2019, as below Average HFC Consumption (2020, 2021, 2022) = 21.93 mil tCO2 equivalent 65% of HCFC Baseline = 8.2mil tCO2 Equivalent Projected Baseline = 30.13mil tCO2 Equivalent 4.Enhance Certified Service Technician Program CSTP Mandated for HVAC&R Technician. 5.Incur Carbon footprint tax towards high GWP refrigerant products and sales tax exemption on low GWP refrigerant products.	Type of High GWP Refrigerant (GWP >=300) Refrigerant / GWP R32 / 675 R410a / 2088 R134a / 1430 R407c / 1774 R50A / 3985 Example: In Year 2029, 10% reduction of High GWP Refrigerants by replacing to alternative system 10% x 30.13million t CO2eq (Baseline)= **3.13million tonnes of CO2 Equivalent.**

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 4 – Waste minimisation

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Minimize construction waste and boost recycling networks Minimize construction waste aiming for zero construction waste by 2030 and boost recycling networks/sector including R&D for circular economy.	Lack of innovation in design. Lack of enforcement of regulations. Lack of guidelines and requirements for 3rd party certification to accurately disclose recycled content in materials.	Design out waste Lean design principles Increase R&D, proof of concept and commercialisation of recycled materials into new buildings, infrastructure and hard landscape.	**Reference: NLCCM KE3 – KD9.4** 1. To promote the adoption of 3R (reduce, reuse, recycle) strategy in construction. 2. To enforce separation of waste act (Act 672) in all states. Initial target of reduction of waste to landfill by 30% by 2030. Minimize construction waste aiming for Zero construction waste by 2050 and boost recycling networks/sector including R&D for circular economy 3. To introduce regulations to increase the recycled content in building materials by requiring the utilization of recycled content of at least 10% based on material cost, of the total value of the materials in the project. **Action By: Federal, State, LA** **Timeline: < 1 year**	Reduced environmental pollution and pressure on landfills. Increased Co2 emissions avoidance. 1 tonne of waste to recycling rather than landfill is equal to 0.917 tonnes of Co2eq offset. Increased job creation and promotion of circular economy.

Appendices

Roundtable output: Property and Construction Sector

Policy 1 – Reduce Operational and Embodied Carbon Impact
Enabler 4 – Waste minimisation

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Promote adoption of IBS	Inefficient IBS ecosystem Customer's perception and acceptance levels. High upfront costs. Mismatch of incentives with market Needs. Cheap foreign labour wages for conventional construction activities. Developers have to comply with laws and regulations. They will only use those materials that approved and fulfilled the requirements. However, not all green materials are approved by the building codes and by-laws.	Explore feasibility in adopting IBS for every project and execute when economies of scale make them viable investment decisions. Increase IBS R&D and commercialisation	**Reference: NLCCM KE3 – KD9.4** 1. Revise UBBL and relevant building codes to be more performance based rather than material based. This will encourage wider spectrum of IBS components. 2. Incentives: • To consider income tax exemptions for developers on revenue from sale of >70 IBS projects and tax-free status on sale of IBS products and services (supply chain) to boost economies of scale and lower the costs of IBS in the long term. • Alternatively, state / LAs to give incentives such as higher plot ratio or density for projects with IBS scores > 70. Reducing compliance costs and/or development charges will also encourage wider adoption of IBS. **Action By: Federal, State, LA** **Timeline: < 1 year**	Reduced environmental pollution and optimisation of construction resources. Reduced embodies carbon. Note: a 2-storey terrace house built the current traditional method has embodied carbon of between of 50 – 80 tonnes of CO2eq. High skilled job creation, reducing dependence on low skilled labour. Improved construction quality.

Appendices

Roundtable output: Property and Construction Sector

Policy 2 – Improved Governance Awareness of Sector GHG Emissions
Enabler 5 – Improved Governance Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Improved governance structure	Lack of coordination between relevant ministries to implement policy action . LAs are not well versed in implementing / enforcing regulations.	Promote carbon footprint measurement and disclosure. PLCs first then adopted by SMEs PLCs establish Board Sustainability Committees to enable compliance to MCCG (April 2021 version)	**Reference: NLCCM KD1 - KD1.1, KD1.2, KD1.3, KD1.4 / NLCCM KD2 - KD2.1, KD2.2** 1. Set up a central coordinating body / PMO to oversee implementation of action items and activities with respect to climate change to flow through all 3 levels of Government – Federal, State, Local Authority. 2. LAs to appoint a champion to report on progress to achieve climate ambitions set out in the NLCCM. 3. Set up a merit-based think tank committee from private sector to provide policy recommendations and drive national action. 4. Set absolute GHG emissions reduction targets as opposed to intensity. Set a net zero roadmap for Malaysia by 2055-2060.	By immediately implementing the requirements first with PLCs as PLCs are already mandated through MCCG, corporate ESG requirements and stakeholder pressure to comply and are therefore already best prepared for this. This will assist with the smooth implementation of plans and higher likelihood of achieving climate change targets. This will in turn naturally cascade to the SME suppliers as PLCs enforce requirements downstream.

Appendices

Roundtable output: Property and Construction Sector

Policy 2 – Improved Governance Awareness of Sector GHG Emissions
Enabler 5 – Improved Governance Sector

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Improved governance structure (continued)			**Reference: NLCCM KD1 - KD1.1, KD1.2, KD1.3, KD1.4 / NLCCM KD2 - KD2.1, KD2.2** 5. Make carbon measurement, disclosure and data assurance mandatory for PLCs immediately. Introduce a standardized carbon calculator to suit local requirements to encourage adoption and participation. 6. Make the same mandatory requirements for SME in a phased approach (larger to smaller) over the next 3 years. **Action By: Federal, State, LA, regulatory authorities** **Timeline: <3 years**	

Appendices

Roundtable output: Property and Construction Sector

Policy 2 – Improved Governance Awareness of Sector GHG Emissions
Enabler 6 – Capacity Building

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Creation and maintenance of database on GHG emissions. Measurement of each entity's carbon footprint through creation of databases and mandatory reporting will be the first step towards creating awareness. Currently, there is a lack of incentive/ penalty in place that encourages/ mandates companies to report on GHG emissions.	Lack of inter-agency collaboration from local level up to federal level, making data collection exercise very difficult. The accuracy, availability and coverage of data are still very low. Lack of transparency and reporting structure on data resources from bottom to top level.	To adopt smart technologies for populating database. All companies to endeavour to implement carbon footprint accounting and set carbon reduction targets.	**Reference: NLCCM KE2 - KD7.1, KD7.2** **Action Item:** 1. Data on GHG Emission could be collected from companies by government (through central coordinating body). 2. Common reporting framework that defines key metrics for data collection. (i.e. energy, water and waste). Offsets to be defined. 3. To mandate GHG reporting through regulations. 4. Promote use of smart technologies for data gathering. 5. Release of timely data as BUR report is 4 years behind. (Preferably a yearly review and report) 6. Make carbon disclosure and data assurance mandatory for PLCs. **Action By: Federal, State, LA, regulatory authorities** **Timeline: <3 years**	Databases on emissions will enable the government measure the progress towards set targets, to review and strategically enhance action plans and raise ambition for climate action plans for the sector. The enforcement of compulsory measurement and disclosure will bring to the fore the urgency of combating climate change to both Government and the private sector.

Appendices

Roundtable output: Property and Construction Sector

Policy 2 – Improved Governance Awareness of Sector GHG Emissions
Enabler 7 – GHG Database

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Capacity building and community participation	Absence of an existing established competence framework on climate change that can easily be adopted. Lack of coordination and communication from the government on sustainability.	Engineering / Architectural Professional bodies to include components of green awareness within assessment process for professional recognition. Set up peer-to-peer learning and knowledge sharing by experienced companies to those beginning carbon footprint accounting and target setting. Engage with subject matter experts to conduct knowledge drives, awareness and education campaigns through respective property industry bodies to their member base e.g... REHDA, MBAM, supply chain associations.	**Reference: NLCCM KE2 - KD6.1, KD6.2** **Action Items:** 1. State and Local Authorities to be trained on enforcement of relevant regulations. Push factor. 2. State and Local Authorities to engage with subject-matter experts to conduct knowledge drives, awareness and education campaigns to the public on the climate change emergency. 3. Local authorities to coordinate and encourage community engagement and participation activities (e.g. MBPJ has an assessment fee rebate for homes that comply with green best practices; e.g... immediately implement waste separation at source policy across all districts.) 4. Update school / university syllabus to raise awareness and create pull factor.	Immediately brings awareness to the common public of the urgency in combating climate change and creates multiple agents of change from ground level up.

Appendices

Roundtable output: Property and Construction Sector

Policy 2 – Improved Governance Awareness of Sector GHG Emissions
Enabler 7 – GHG Database

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Capacity building and community participation (continued)			**Reference: NLCCM KE2 - KD6.1, KD6.2** **Action Items:** 5. Set a common Malaysian carbon assessment framework setting out standards for compliance for water, waste, power, tropical forest sequestration, renewable energy that will enable government to track progress. 6. Allocate funding for Malaysian start-ups (academic or private) to exploit promising ideas and research. **Action By: Federal, State, LA** **Timeline: < 5 years**	

Appendices

Roundtable output: Property and Construction Sector

Policy 3 – Conserve Biodiversity and Natural Carbon Sinks
Enabler 8 – Promote Conservation

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Promote the conservation of biodiversity in buildings and infra plans	The challenges for the sector lie in the lack of strong leadership for conservation activity and unwillingness of society to pay the increased cost associated with sustainable activities.	Developers to apply increased tree planting ratio of native species that serve to increase conservation and store carbon. Apply process of high-density tree planting as carbon sinks. Companies to adopt shadow pricing disclosure of carbon emissions to communicate impact of pricing to their business profitability.	**Reference: NLCCM KD9 – KD9.1** 1. Government needs to better engage with the private sector - there is a lot of good work being done by the private sector which should be highlighted and encouraged. 2. Low Carbon Cities Catalyst Grant to distribute funds to more LA's. 3. Government to set carbon price to enable companies to determine impact through shadow pricing. 4. All local authorities to require the planting of indigenous species / drought resistant plants within their districts and in all new developments.	Support national targets to maintain 50% forest cover in Malaysia.

Appendices

Roundtable output: Property and Construction Sector

Policy 3 – Conserve Biodiversity and Natural Carbon Sinks
Enabler 8 – Promote Conservation

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
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Policy 3 – Conserve Biodiversity and Natural Carbon Sinks
Enabler 8 – Promote Conservation

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Promote the conservation of biodiversity in buildings and infra plans (continued)			**Reference: NLCCM KD9 – KD9.1** 5. Incentives / Disincentives: • Provide incentives for developers to increase carbon sinks (e.g.. biodiverse mini forests that require minimal maintenance after 3 years) versus current practice of planting exotic plants (e.g. Assessment rebates / double tax deductions for planting indigenous / drought resistant plants - rebates / deduction applicable 1 year after planting upon survival of plants.)	

Appendices

Roundtable output: Property and Construction Sector

Policy 3 – Conserve Biodiversity and Natural Carbon Sinks
Enabler 8 – Promote Conservation

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Promote the conservation of biodiversity in buildings and infra plans (continued)			**Reference: NLCCM KD9 – KD9.1** 5. Incentives / Disincentives (continued): • Set up an environment conservation fund. Significant polluters such as power generation companies and other dirty industries will contribute a % of their revenues based on carbon pricing into an Environment Conservation Fund. The funds collected will be channelled to the specific State Government agencies in charge of preserving and conserving gazetted forests/green spaces towards ensuring these forests/spaces remain conserved. The financial incentives received must exceed the potential revenue from sale of these lands. **Action By: Federal, State, LA** **Timeline: <3 years**	

Appendices

Roundtable output: Property and Construction Sector

Policy 3 – Conserve Biodiversity and Natural Carbon Sinks
Enabler 9 – Reduce Urban Heat Island Effect

How can the sector accelerate actions towards climate transition?	What are the barriers and challenges that the sector is facing to accelerate the climate transition?	How can the private sector contribute to drive the climate transition?	What can the government do further to accelerate the transition?	Impact
Promote Reduction of Urban heat island in all developments	The challenges for this sector lies in over development in cities with decrease of urban greenery causing Urban Heat Island effect with measured temperature rise where localities with high developments	Developments need to increase the urban greenery and green plot ratio within sites to mitigate temperature rise. Green building certification to be mandated for all new projects with a minimum green plot ratio requirement as a pre-requisite criteria.	**Reference: NLCCM KD9 – KD9.1** 1. PLAN Malaysia to incorporate the Green Plot Ratio metric (GnPR) into planning guidelines to encourage adoption of greenery in high density urban settings. To be adopted by respective PLANs in State Gov and LAs. 2. To determine appropriate tree or palm species to be planted along walkways for shading purposes. **Action By: Federal, State, LA** **Timeline: <1 year**	Support national targets to maintain 50% forest cover in Malaysia. Effectively cooling the environment

Thank you

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