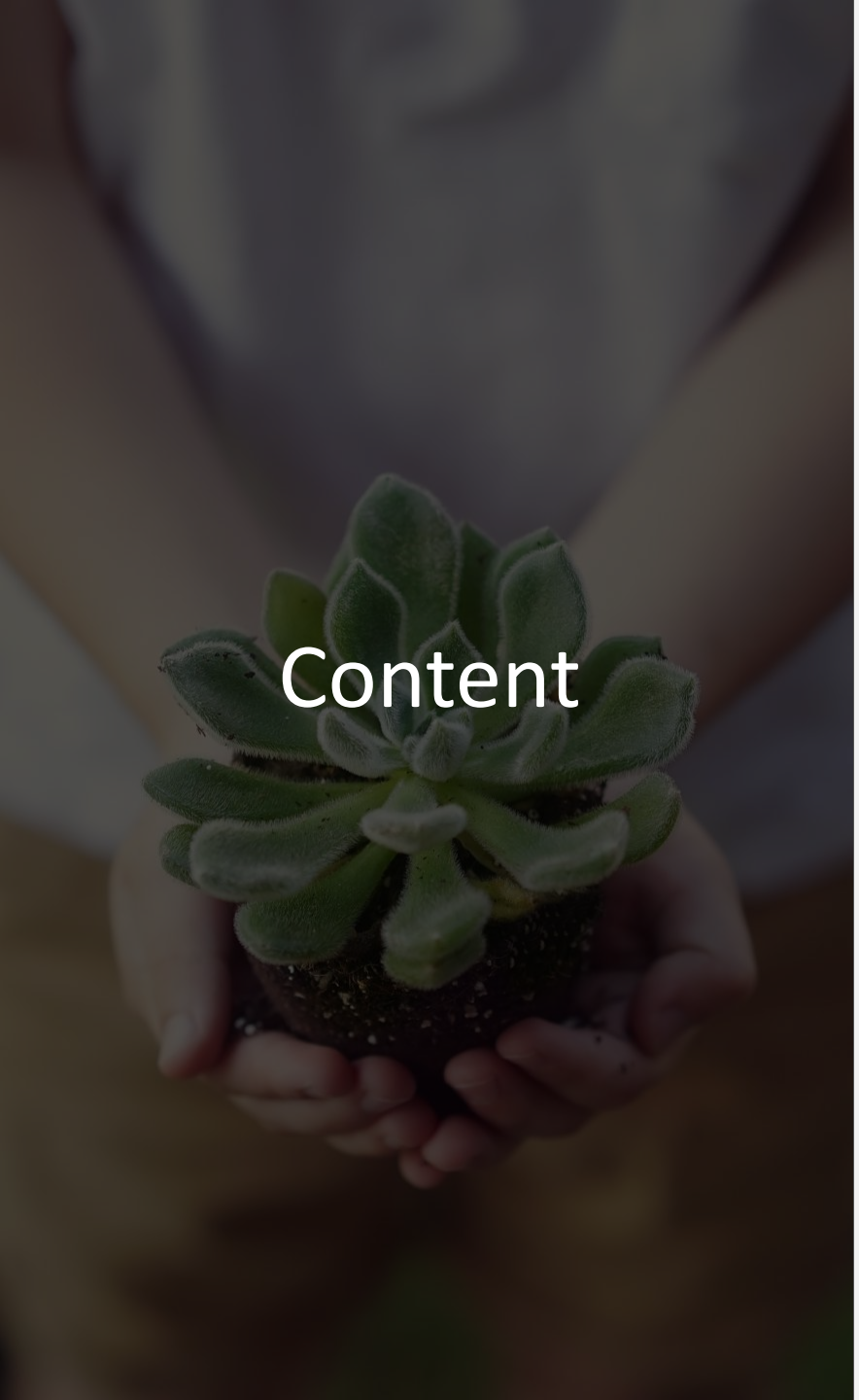
MINISTRY OF
INVESTMENT, TRADE AND INDUSTRY

GREEN INVESTMENT STRATEGY (GIS) SUMMARY



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Context of Green Investment Strategy

Background of Green Investment Strategy:

- Malaysia is committed to Net Zero by as early as 2050
- In alignment with this, NIMP has outlined Push for Net Zero as one of its key mission while NETR identified ~RM 1.2-1.3 trillion of funding required by 2050 for Malaysia's energy transition
- Ministry of Investment, Trade and Industry (MITI) is undertaking Green Investment Strategy to identify potential sources of investment to support NETR & NIMP ambitions
- The 10-week Green Investment Strategy study builds on the recommendations of NETR & NIMP, while also taking into account other relevant levers' roadmaps and policies

Objectives of Green Investment Strategy

Develop Malaysia's Green Investment Strategy to:

1. Position Malaysia as **a prime destination for green investment** (foreign and domestic), boosting the inflow of capital into Malaysia's green economy and address the funding gap to support NETR;
2. **Stimulate economic growth**, particularly in green industries, leading to the creation of new jobs and skills development in Malaysia's green economy;
3. Contribute to Malaysia's efforts to meet its **net zero emission goals**; and
4. Enhance Malaysia's **competitiveness on the international stage**, attracting more investors and positioning the country as a leader in green technologies

Green Investment Strategy is aligned with national agenda in NETR, NIMP, and NIP

New Industrial Master Plan (NIMP) 2030

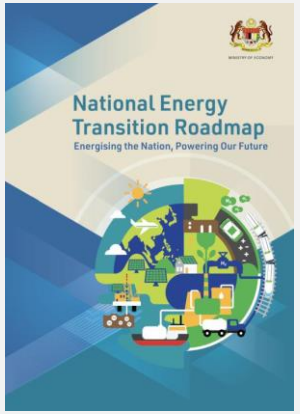
New Investment Policy (NIP)

Mission 3: Push for net zero

Aims to decarbonise the manufacturing sector to achieve Net Zero emissions by as early as 2050 while capitalising on new green growth areas, especially on:

- Renewable Energy (RE)
- Electric Vehicle (EV)
- Carbon Capture, Utilisation & Storage (CCUS)
- Circular Economy (CE)

National Energy Transition Roadmap (NETR)



Accelerate country energy transition towards Net Zero while stimulating socio-economic growth

Energy Efficiency (EE), RE, Hydrogen, Bioenergy, Green Mobility, CCUS

- RM 1.2 – 1.3 trillion investments required
- RM 310,000 direct job creation vs. 2022
- RM 200 – 220 billion GDP impact vs. 2022
- 32% Greenhouse Gas (GHG) emissions reduction vs. 2019
- 70% RE share of installed capacity

Note: Direction from various national roadmaps and taxonomy in place have also been reviewed such as BNM CCPT, SC SRI, HETR, LCMB, etc.

Green Investment Strategy incorporated inputs from various key national roadmaps and policies to ensure alignment

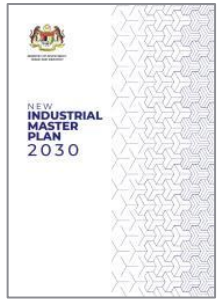
Non-exhaustive

RMK-12

Economy Madani Framework

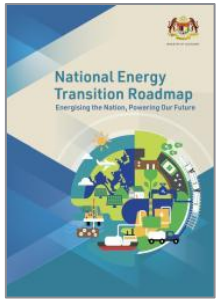
EKONOMI MADANI
Memperkasa Rakyat

New Industrial Master Plan 2030 (NIMP)

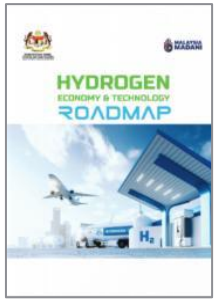


New Investment Policy (NIP)

National Energy Transition Roadmap (NETR)



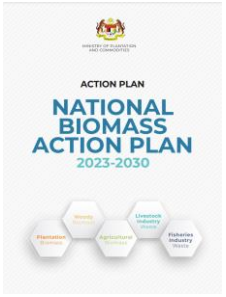
Hydrogen Economy and Technology Roadmap (HETR)



BNM CCPT[1]/SC SRI[2]

Technology Investment Framework

National Biomass Action Plan (NBAP)



Circular Economy Policy Framework

Note: Note: LT-LEDS to be launched EOY 2024, new targets will be reviewed by NRES when available
1. Climate Change and Principle-based Taxonomy 2. Sustainable & Responsible Investment Taxonomy

Green Investment Strategy

Overview

Green Investment definition based on existing taxonomy; focus on 7 low-carbon levers in NETR & NIMP

Green Investment

Economic activities that contribute to climate change mitigation and/or adaptation while not harming the environment and social wellness[1]

Low-carbon levers under **NETR & NIMP**

- Energy Efficiency
- Renewable Energy
- Hydrogen
- Bioenergy
- Green Mobility (Land, Marine, Aviation)
- CCUS
- CE (with focus on manufacturing)

Other levers meeting "Green Investment" principles for future considerations:

Nature-based solutions:
- LULUCF[2]
- Sustainable & regenerative agriculture
- Sustainable water management
- Blue economy
- Nature & biodiversity conservation
- …

Emerging energy-related tech:
- Nuclear Small Modular Reactor (SMR)
- Geothermal
- Ocean-thermal
- …

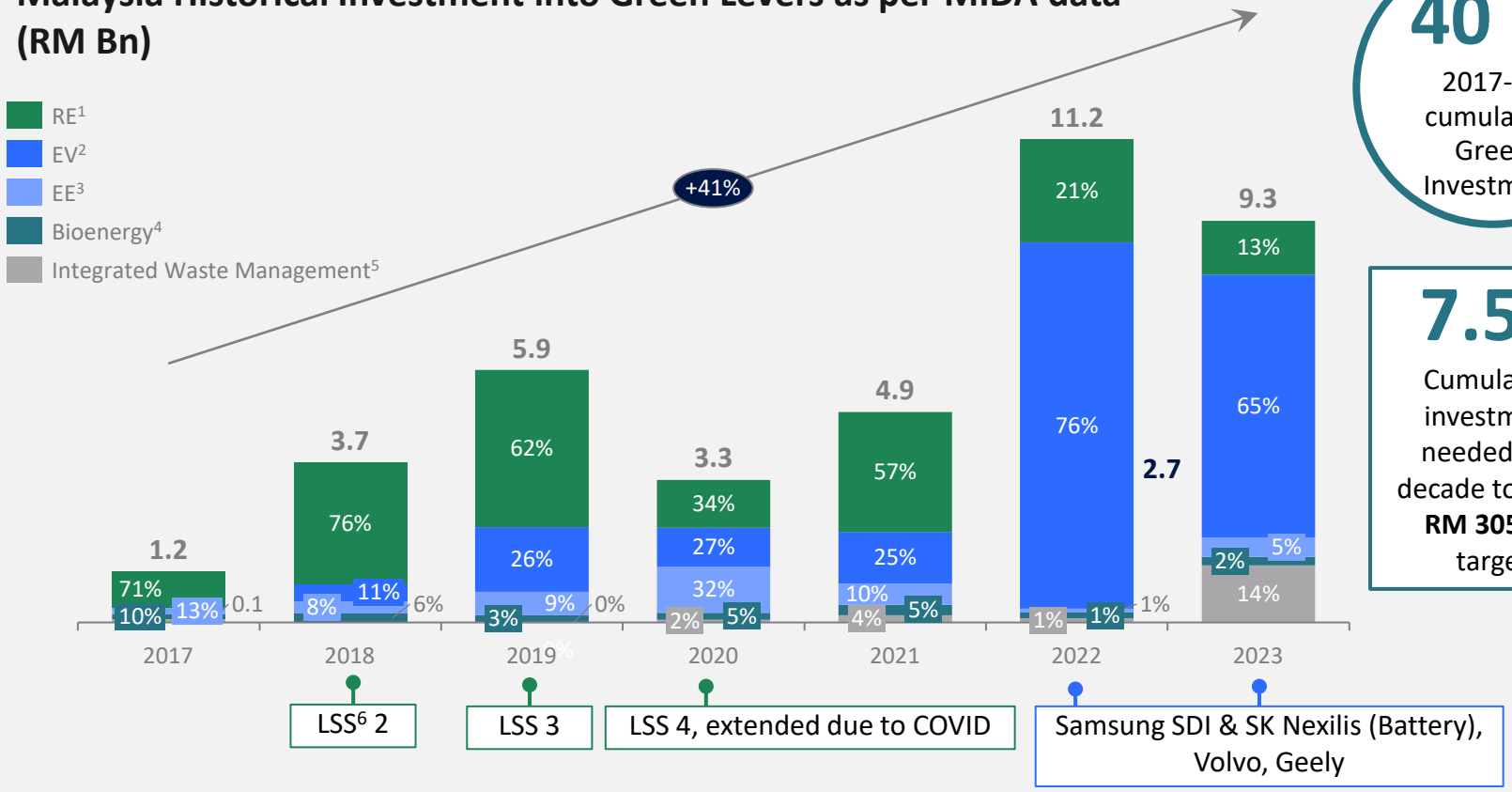
Emerging carbon capture tech:
- Direct Air Capture
- BECCS[3]
- Enhanced weathering
- …

Adopting a principle-base approach for Green Investment definition allows Malaysia to be **flexible & robust in attracting Green Investments** as long as key principles are met

1. Satisfactory remedial measure must be put in place if activity is deemed to have caused harm to the environment, definition as per BNM Climate Change & Principle-based Taxonomy C1 & C2 classification developed in collaboration with World Bank guidance; 2. Land use, land use change & forestry; 3. Bioenergy with carbon capture and storage
Source: NETR, NIMP

Baseline | Historical Green Investment dominated by RE & EV; ~7.5X investment needed this decade to meet target

Malaysia Historical Investment into Green Levers as per MIDA data (RM Bn)



40 Bn
2017-23 cumulative Green Investment

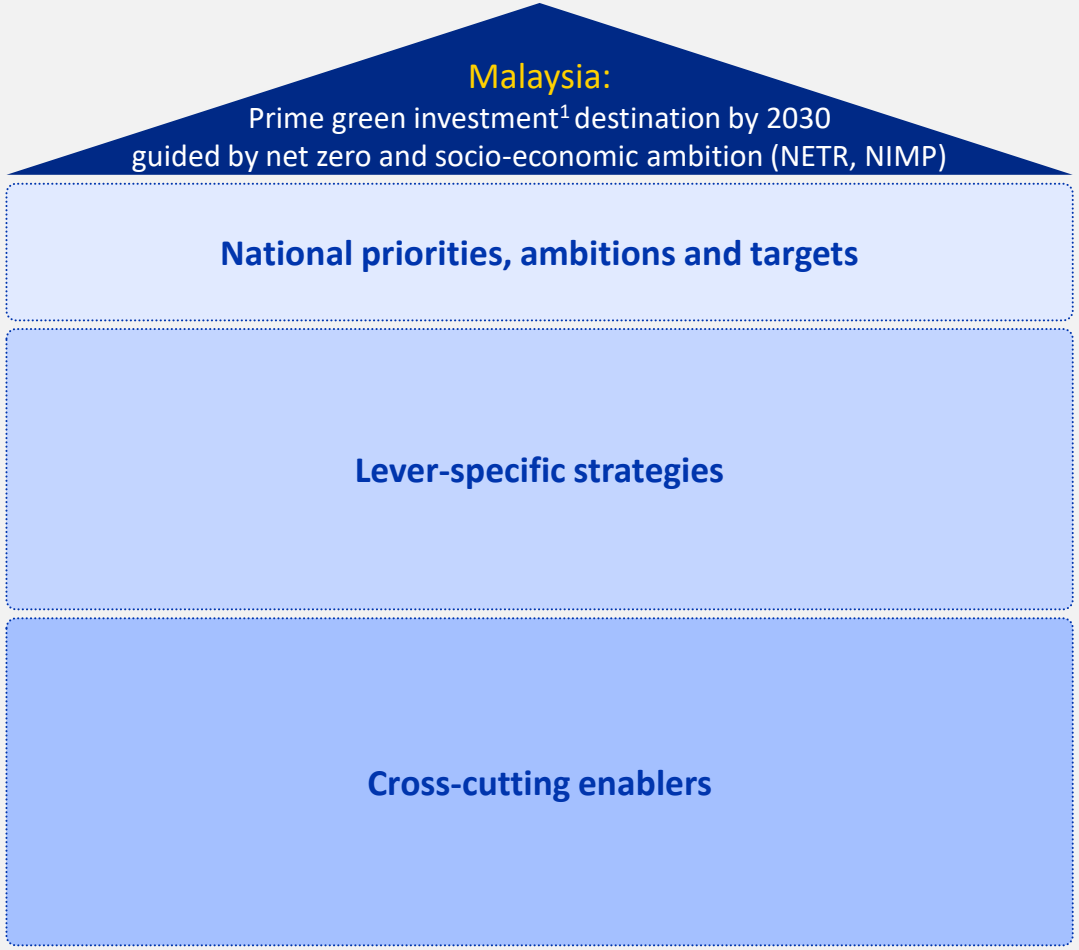
7.5X
Cumulative investment needed this decade to meet **RM 305 Bn** target

Note: Data covers private investment captured by MIDA database as part of approved investment in the specified year
1. Includes solar and small hydro; 2. Includes manufacturing and assembly of Electric Vehicle and related components, parts, system and modules; 3. Includes green building & green services; 4. Includes biomass and biogas plant; 5. Includes integrated waste management & waste to energy project; 6. Large Scale Solar
Source: MIDA Green Tech Division

Observations

- **Green Investment** approved by MIDA has recorded a **significant growth of ~40%CAGR** for past 7 years
- **RE accounted for 60-70% of total Green Investment up to 2019**, Solar contributed vast majority of investment into RE lever under LSS scheme
- **Investment into EV recorded tremendous growth since 2021 and is now the largest Green Investment lever,** due to multiple major investments into EV battery cell production & assembly
- Despite impressive track record above, **Malaysia will need to ~7.5X its Green Investment to meet RM 305 Bn funding target this decade**

Overview | Green Investment Strategy comprises of national targets, lever-specific strategies & cross-cutting enablers



Malaysia's ambition to be a ***prime Green Investment destination*** by 2030 …

…to ***support overall national priorities*** of investment competitiveness, net zero emissions and socio-economic growth

…through ***implementing investment strategies for 7 levers*** that have been identified through NETR & NIMP (CCUS, Hydrogen, RE, EE, Green Mobility, Bioenergy, CE)

…and ***supported by 5 cross-cutting enablers*** to strengthen Malaysia's Green Investment Ecosystem

1. Green investment includes beyond the 7 levers, though this study only focuses on NETR and NIMP levers
Source: NETR, NIMP, CE

Overview | Malaysia's Green Investment Strategy by 2030

Malaysia's Green Investment Ambition …

Malaysia:
Prime green investment[1] destination by 2030 guided by net zero and socio-economic ambition (NETR, NIMP)

… to achieve overall national priorities …

Investment competitiveness		2030 emission goal		Socio-economic growth	
Top 17 in Global Competitiveness Index[2] (2023: 27th)	Top 20 in Global Opportunity Index[3] (2023: 27th)	45% carbon intensity reduction[4,5] per GDP (2021: 33%)	"Grade A" in Sustainalytics Ratings[5] (2021: "Grade C")	RM 80bn GDP impact[6]	350k additional high-skilled jobs[6]

… through implementing 7 lever-specific strategies, each requiring specific strategic unlocks to accelerate investments

CCUS	Hydrogen	Renewable Energy	Energy Efficiency	Green Mobility	Bioenergy	Circular economy
Capture immediate Carbon Storage opportunity with foreign emitters, leverage returns to **develop domestic Capture and Utilisation** in the future	**Prioritise export** demand of Green H_2 to key export countries and **scale domestic** demand	**Sustain positive momentum** and scale up solar, upgrading grid and debottleneck small hydro	**Move up Energy Service value chain** & capture EECA[7] demand	**Continue local EV ramp-up[8]** and attract investors leveraging REE[9] /semiconductor strengths, **prepare to scale marine/ aviation fuel** for future demand	**Enhance biomass/biogas economics** and consolidate synergies between power operators and feedstock suppliers	**Grow new re-manufacturing** sector where there is large local supply base (e.g. EV, solar panels)

… supported by 5 cross cutting enablers to strengthen Malaysia's Green Investment Ecosystem

- Green investment promotion: Leverage Green narrative to market Malaysia as prime Green investment destination
- Fiscal and Financial incentives : Implement targeted incentives while balancing growth potential and budgetary prudence
- Green synergies: Develop Green levers collectively to catalyse Green Investment and infrastructure buildout for accelerated technology adoption
- Talent and capabilities: Cultivate domestic green talent pool and bolster institutional capabilities to support Green Investment
- Governance: Ensure effective acceleration of Green investment strategies, leveraging whole of government approach

1. Green investment includes beyond the 7 levers, though this study only focuses on NETR and NIMP levers; 2. MADANI's goal to rank in the Top 12 countries in 2033; 3. Milken Institute; 4. Based on Nationally Determined Contributions (NDC) goals compared to 2005 levels; 5. Featured in NIMP; 6. NETR and CE; 7. Energy Efficiency Conservation Act; 8. Electric vehicles include 2-wheelers and 4-wheelers; 9. Rare earth elements; strategy in line with ongoing exploratory efforts on assessing Malaysia's REE potential by NRES
Source: NETR, NIMP, CE

Green Investment Targets | Interim investment and operational targets by 2030 for each lever identified by NETR and NIMP

	CCUS	Hydrogen	Renewable Energy[3]	Energy Efficiency	Green Mobility[4]	Bioenergy	Circular economy	Total
Investment target (RM)	33 bil	23 bil	96 bil	16 bil	70 bil	2 bil	65 bil	305 bil
Op. target[1,2]	15 Mtpa storage capacity	1 Green hydrogen hub	31% installed RE capacity	8% savings against BAU	15% xEV TIV share of fleet[5]	500 MW installed capacity	55% savings in industrial waste	
GDP impact[2] (RM)	11 bil	7.3 bil	8.1 bil	5.5 bil	36 bil	1.5 bil	11 bil	80 bil
Add. jobs[2]	67,000	50,000	63,000	18,000	71,000	1,000	80,000	350,000

Investment competitiveness | 2030 emission goal | Socio-economic growth

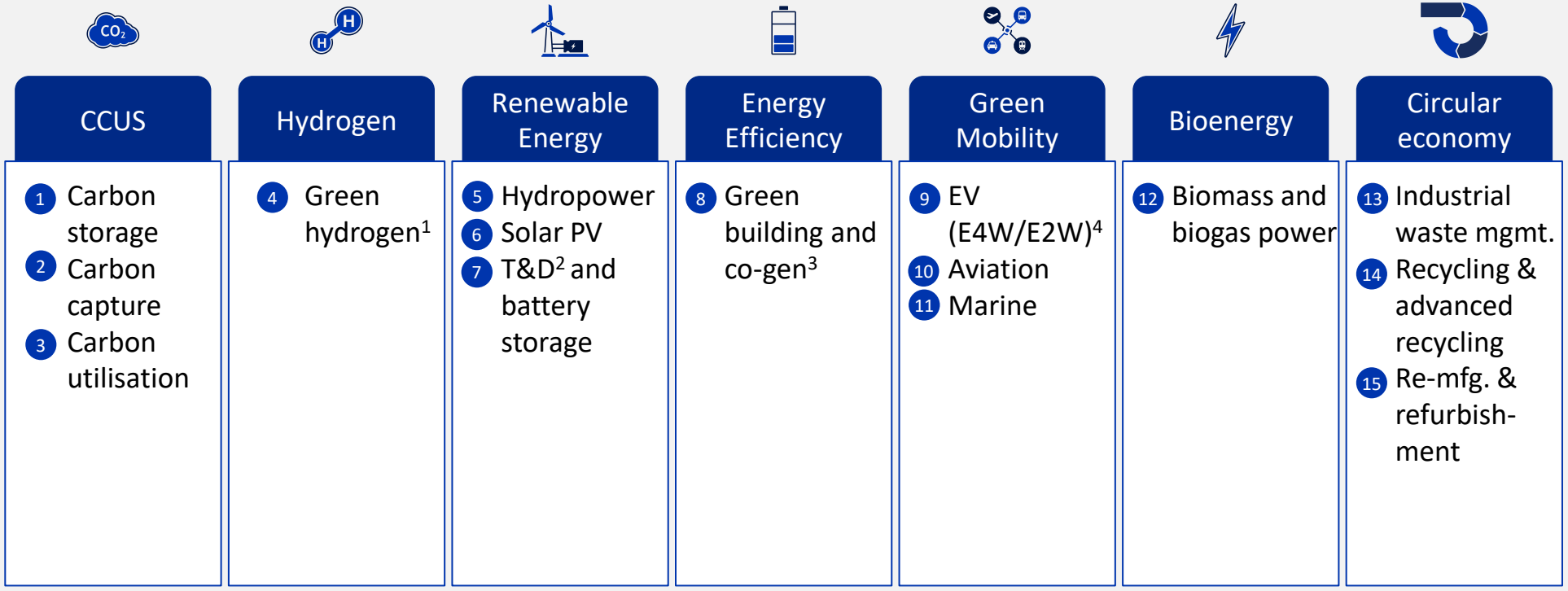
1. Selected operational targets; 2. Targets sourced from NETR, NIMP and CE; 3. Include gas for power system transition; 4. Include public transport; 5. In line with target set in LCMB
Source: NETR, NIMP, CE

Green Investment Strategy

Lever Specific Strategies

Investment Levers | 15 green Investment Opportunities (IO) identified across the 7 levers based on NETR & NIMP

Malaysia:
Prime green investment[1] destination by 2030 guided by net zero and socio-economic ambition (NETR, NIMP)



1. Applications include industrial use (Ammonia, Methanol, Steel); 2. Transmission and Distribution; 3. Include green constructions, consulting services, and building retrofit;
4. Only include hybrid and battery EV, hydrogen-transport (Heavy vehicles, Shipping) penetration rate is negligible under NETR assumptions pre-2030
Source: NETR, NIMP, CE

Prioritisation | IO categorised based on Malaysia's right-to-win and investment targets as per NETR and NIMP

1. Quick win

"High right-to-win, low investment target"

Sustain existing momentum and transition to high-value play

Solar PV
Green Building
EV (E2W/E4W)

2. Big rock

"High right-to-win, high investment target"

Catalyse investment via strategic partnerships while enhancing local industrial ecosystem

- Carbon Storage
- Green Hydrogen

3. Opportunity gateway

"Moderate right-to-win"

Strengthen right-to-win by addressing key barriers to increase investment attractiveness and build scale

- Remanufacturing & Refurbishment
- Transmission & Distribution
- Small Hydropower
- Marine
- Biomass & Biogas Power

4. Emerging frontier

"Low right-to-win"

Develop regulatory and technological foundation, capture emerging opportunities as needed

- Industrial Waste Management
- Recycling & Advanced Recycling
- Aviation
- Carbon Capture
- Carbon Utilisation

1 Investment Opportunity - Carbon Storage | High potential for FDI given Malaysia's strong carbon storage capabilities and proximity to Japan and Republic of Korea (ROK)

IO prioritisation	**Big rock –** prioritised as a 'big rock" due to Malaysia's strong starting position to win investments and the need to secure high investments
Target (By 2030)	**Cumulative investment target:** RM33 bil **Operational target**: 3 CCUS hubs (2 in Peninsular Malaysia, 1 in Sarawak)
Malaysia's right-to-win	**Natural advantages:** Excess pore space and close proximity to high-emission countries; access to biogenic CO_2 for EOR[1]/EGR[2] and E-NG[3] generation **Know-how:** Multiple potential carbon storage sites; O&G enterprises have the existing capabilities, such as on EOR/EGR, to support scaling of CCS[4] **Regulatory support:** Tax incentives on CCUS Capex but lack of domestic regulatory frameworks **Economic potential:** Multiple high CO_2 gas fields but lack of incentive systems; increasing interest in e-NG in countries such as Japan Low Medium High

FDI potential (By 2030)	**CCUS for high CO2 Gas Fields** Medium (~30%)	**Carbon Transportation and Storage** High (~50%)
Rationale of FDI potential	• IOC's active in CCUS may look into more strategic JVs around Gas access & CCS services	• Japan and ROK will aim for guaranteed carbon storage as they have a strong need for carbon storage solutions given their high CO_2 emissions with low storage capacities
Key unlocks	• **Regulatory framework:** Develop domestic CCUS regulation to ensure international recognition and cross border CO_2 transportation • **Incentives:** incentivise CCUS hub operators through cost and risk-sharing mechanisms (e.g.: contract for difference mechanisms) • **Infrastructure & capabilities:** Establish hubs in areas with high-density domestic emitters and stranded gas reserves • **Outreach:** Build G2G bilateral agreements to enable cross-border CO_2 and allow more foreign investment in CCUS	

Source: FGD, Stakeholders interview, BCG analysis

1. Enhanced Oil Recovery (EOR); 2. Enhanced Gas Recovery (EGR); 3. Electric Natural Gas (e-NG); 4. Carbon Capture and Storage (CCS)

2 Investment Opportunity - Carbon Capture| Initial review indicates technology and solutions too costly due to nascency, further modelling needed

IO prioritisation	**Emerging frontier –** Malaysia still needs to develop capabilities and know-how given the nascency of Carbon Capture (CC)
Target (By 2030)	No investment target set for CC in NETR
Malaysia's right-to-win	**Natural resources:** Potential carbon capture in high carbon emitters such as power, steel and cement industries **Know-how:** Currently no explicit experience in Malaysia, R&D efforts are required. Early-stage development led by foreign entities **Regulatory support:** No regulations, stipulations for facilities or liability associated with failure to capture CO2 **Economic potential:** Unattractive due to high potential cost as market is nascent. Further analysis of potential needed Low Medium High

FDI potential (By 2030)	**Carbon Capture for high domestic CO2 gas emitters** None - Low (0%)
Rationale of FDI potential	• Carbon Capture technologies are still very nascent and expensive, difficult to attract investors while Malaysia do not have technological expertise to conduct research and development. Available investments are not fiscally viable for application across domestic emitters
Key unlocks	• **Governance:** Conduct economic modelling to understand feasibility of carbon technology across high emitting industries such as power and heavy industries like steel and cement that contribute ~70% of emissions • **Incentives**: Cost of investment is potentially high and needs to be determined if possible to be shared across the economy by leveraging Contract for Difference mechanism (e.g. electricity bills, refined products at petrol stations etc.) or heavily subsidised by the government through grants or carbon taxes

Source: Expert interview, BCG analysis

3 Investment Opportunity - Carbon Utilisation| Domestic investments to drive R&D on improving unit economics as industry is still nascent at a global level

IO prioritisation	**Emerging frontier –** Malaysia still needs to develop capabilities and know-how given the nascency of Carbon Capture & Utilisation (CCU)
Target (By 2030)	No investment target set for Carbon Utilisation in NETR
Malaysia's right-to-win	**Natural resources:** High levels of in-land and coastal emissions from various industries such as agriculture, power, steel and cement **Know-how:** Very limited know-how for novel CCU technologies **Regulatory support:** No standards and regulatory framework on CCU yet to **Economic potential:** Novel CCU tech not ready for scale given as unit economics can be 1.5x to 5x of conventional counterparts Low Medium High

FDI potential (By 2030)	**CCUS local value chain** None-Low (0%)
Rationale of FDI potential	• Driven by domestic investments given the nascency of the industry. Foreign investors likely limited to Multilateral Development Banks (MDBs) and Development Finance Institutions (DFIs)
Key unlocks	• **Governance:** Evaluate the feasibility and economics of the technologies involved in the different utilisation pathways to determine the appropriate prioritisation and allocation of resources • **Incentives:** Provide financial support for R&D activities with key stakeholders such as top industry players (such as O&G and construction) or universities to advance Malaysia's know-how

Source: OGCI CCU Study

CCUS Key Unlocks | Build strong domestic capabilities & regulatory framework to encourage local adoption & establish international recognition

	Key unlocks identified	Lead
Regulatory framework & governance system	• Develop domestic CCUS regulations, with clear, defined roles from respective players to ensure international recognition of standards in Malaysia, enabling cross border transportation of CO_2	• KE[1]
	• Control costs & risk for domestic emitters	
	• Assess the feasibility and economics of implementing carbon capture especially for high emission industries such as power, steel and cement	• MITI[2]
	• Evaluate the feasibility, economics and prioritization of the different utilisation pathways	
Incentives, R&D grant, and partnership	• Design fiscal and non fiscal regimes to enable and facilitate adoption of CCUS as a lever for decarbonisation whilst maximizing value from international demands	• KE/MOSTI[3]/MOF[4]/PETRONAS[5]
	• Scale R&D activities on carbon utilisation to build local knowledge and capabilities	• KE/MOSTI/KESUMA[6]
Infrastructure development, capabilities and technology transfer	• Establish commercial model of CCUS hubs around locations with density of domestic emitters, & stranded gas reserves to offer additional gas required to facilitate the shift away from coal. This will strengthen Malaysia's position in the global LNG market with low carbon intensity LNG	• PETRONAS[7]
Promotion, awareness & marketing outreach	• Build bilateral agreements that establish the legal basis for cross-border CO_2 transfers and transactions, including the movement of CO_2 across jurisdictions, to enable for more foreign investments in CCUS	• KE

Carbon storage | Carbon capture | Carbon utilisation

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis

[1]Ministry of Economy (KE), [2]Ministry of Investment, Trade and Industry (MITI), [3]Ministry of Science, Technology & Innovation (MOSTI), [4]Ministry of Finance (MOF), [5]Petroliam Nasional Berhad (PETRONAS), [6]Ministry of Human Resources (KESUMA)

4 Investment Opportunity - Green Hydrogen| High potential for FDI given attractiveness of Green H_2 for export to Japan & Republic of Korea (ROK) in short-medium term

IO Prioritization	**Big rock –** Prioritized as a 'big rock" due to Malaysia's strong starting position to win investments and the need to secure high investments
Target (By 2030)	**Cumulative investment target:** RM23 bil **Operational target**: 1 Green hydrogen hub
Malaysia's right-to-win	**Natural resources:** Ample access to RE resources, with Solar in Peninsular and Hydropower in Sarawak **Know-how:** Nascent but ongoing partnerships, MOUs & pilots for domestic application or with export partners **Regulatory support:** No hydrogen specific standards & regulations but initiatives planned in HETR **Economic potential:** Projected to capture 10% of Japan & ROK import demand, local demand driven by industrial use Low Medium High

	1. Export-oriented Investment[1]	2. Domestic Offtake Investment[2]
FDI potential (By 2030)	High (~50-60%)	Low-Medium (0-30%)
Rationale of FDI potential	- High equity stake for foreign partners from Japan & Korea critical to lock down long-term offtakers and gain access to demand side subsidy. Mainly driven by large hydro in Sarawak	- Driven mainly by domestic investors supplying to downstream offtakers with demand for low-carbon product using Green H2 (e.g., steel, fertilizer, mobility). Demand driven by Solar in Peninsular and partly large hydro in Sarawak

Key unlocks

- **Regulatory framework:** Adopt and elevate HETR as principle guiding document for hydrogen economy development in Malaysia. Accelerate adoption of low carbon hydrogen standards & regulatory framework in Malaysia, using export targets standards as interim reference
- **Incentives:** Investigate feasibility to provide more incentives via higher financing cap under Green Technology Financing Scheme (GTFS) and/or electricity OPEX reduction via partial wave of wheeling charge
- **Outreach:** Elevate export-oriented partnership via G2G negotiation with Japan & Korea to facilitate trade partnerships at the highest level, monitor import-export dynamic with China

1. To drive majority of investment this decade (~75%) due to higher demand as per HETR; 2. To make up smaller portion of investment required due to more nascent and relatively small demand for local needs

Source: FGD, Stakeholders interview, BCG analysis

Green Hydrogen Key Unlocks | Build on and accelerate initiatives already identified in HETR, with a sharper focus on unlocks which drive investments

	Key unlocks identified	Lead
Regulatory framework & governance system	• Adopt and elevate HETR as principle guiding document for hydrogen economy development in Malaysia – *HETR 1.1.1*	• **MOSTI**
	• Accelerate adoption of low carbon hydrogen standards especially on guideline for verifiable certification system (from 2035 to 2025) – *HETR 1.2.2*	• **JSM[1]**
	• Apply to be participating members of ISO/TS-97 through Standards Malaysia – *HETR 1.2.4*	
Incentives, R&D grant, and partnership	• Improve access to green electron via bilateral agreement or TPA framework & investigate feasibility of incentivising RE supply for Green H2 production (e.g., partial waive of wheeling charge)	• **ST[2]**
	• Investigate feasibility to increase GTFS financing cap beyond RM 100 Mn for Green H2 production CAPEX	• **MOF**
	• Explicitly highlight & market inclusion of Green Hydrogen production under GTFS scheme (currently embedded under Producer of Green Product)	• **MGTC[3]**
Infrastructure development, capabilities and technology transfer	• Establish collaborative platform to matchmake B2B & B2C supply-demand and partnership among local players – *HETR 1.2.1*	• **MOSTI**
	• Expedite establishment and allocation of National Hydrogen Fund for strategic hydrogen assets such as early production & shared infra (from 2027 to 2025) – *HETR 2.1.3*	
Promotion, awareness & marketing outreach	• Accelerate G2G negotiations to facilitate trade partnerships at the highest level, targeting Japan and Korea – *HETR 1.1.2*	• **MITI**
	• Develop projects in accordance with export market requirement to qualify for target export countries demand side subsidy	

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis
[1]Standards Malaysia (JSM), [2]Energy Commission (ST), Ministry of Finance (MOF), [3]Malaysian Green Technology and Climate Change Corporation (MGTC)

5 Investment Opportunity - Solar PV| Scale up current LSS mechanism leveraging active investor landscape, optimize potential return for SG

IO Prioritization	**Quick win –** Malaysia already has strong regulatory foundation and mature investment landscape to continue scaling investment in Solar PV
Target (By 2030)	**Cumulative investment target:** RM13 bil **Operational target**: ~7GW by 2030
Malaysia's right-to-win	**Natural resources:** Located in Sunbelt with relatively high solar irradiance, up to 99% untapped potential **Know-how:** Healthy mix of local and foreign investors after 4 rounds of LSS, however historical project scale relatively small due to global best practice **Regulatory support:** Well-established mechanisms and incentives to add Solar PV of all types to grid **Economic potential:** Expected to reach 60GW by 2050 as per NETR, further growth will be limited without grid upgrade Low Medium High

FDI potential (By 2030)	**Relatively mature investment landscape with high foreign participation via LSS already, maintain status quo of allowing up to 49% foreign participation** High (~49%)
Rationale of FDI potential	• Relatively well-established LSS & Net Energy Metering (NEM) mechanism has attracted sizable presence of foreign investors due to solid returns, expected future rounds of LSS to continue allowing foreign participation up to 49% for JV with local partners • Potential to export RE to neighboring countries via Energy Exchange Malaysia (ENEGEM) expected to attract foreign offtakers form Singapore to invest in local projects via aggregator model
Key unlocks	• **Regulatory framework:** Provide longer term clarity on role of Solar in Malaysia power system via Jawatankuasa Pembangunan dan Pelaksanaan Pembekalan Elektrik dan Tarif (JPPPET) to solidify investor confidence, Establish more regular rounds of LSS with bigger package size, Expedite Third Party Access (TPA) framework release with clear & transparent charges, mechanism & governance • **Outreach:** Initiate G2G negotiation to further tap on RE export opportunity to Singapore, potentially set up separate export-oriented LSS auction • **Capability:** Increase coordination in policy execution between federal & state government – e.g., Setting up coordinating body expedite land acquisition for Solar Park

Source: FGD, Stakeholders interview, BCG analysis

Solar PV Key Unlocks| Continue current momentum to scale domestic capacity via existing mechanism, optimize potential return for SG export

	Key unlocks identified	Lead
Regulatory framework & governance system	• Provide longer term clarity on future role/model of Solar in official guideline or policies (JPPPET) – e.g., expected capacity, grid firming requirement, interconnection requirement • Refine current LSS mechanism to balance between execution capabilities and return, e.g., remove one bid per bidder limitation and build in mechanism for tariff revision • Establish more regular rounds of LSS with bigger package size, with goal of eventually moving away from tendering mechanism with limited quota • Expedite TPA framework release with clear commercial offtake mechanism – e.g., transparent governance, pricing mechanism, data access etc based on willing-seller willing buyer basis • Expand virtual aggregation mechanism (e.g., NOVA program) to government and residential buildings for aggregation of rooftop space and sale to offtakers – NETR RE 3 • Explore feasibility of increasing capacity limit per company under NEM NOVA (now 1MW per company) • Expand Self Consumption (SELCO) scheme to other type of solar beyond current rooftop-solar (e.g., ground-mounted, floating)	• **PETRA[1]/ST**
Incentives, R&D grant, and partnership	• Evaluate feasibility of incentivizing State gov to set up more Solar Park (min size required, e.g., 300MW) via grants, subsidies etc.	• **MOF/MIDA[2]**
Infrastructure development, capabilities and technology transfer	• Increase coordination in policy execution between federal & state government – e.g., Standardise permitting process and set client charter for maximum processing time of land permit for Solar park	• **KPKT[3]/ST**
Promotion, awareness & marketing outreach	• Initiate G2G negotiation to further tap on RE export opportunity to Singapore beyond current 300 MW limit, potentially set up separate export-oriented LSS auction via aggregator model	• **KE**

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis

[1]Ministry of Energy Transition and Water Transformation (PETRA), [2]Malaysia Investment Development Authority (MIDA), [3]Ministry of Housing and Local Government (KPKT)

6 Investment Opportunity - Small hydropower| Domestic-led investment with potential to improve permitting process for better financial return

IO Prioritisation	**Opportunity gateway** – Potential to further enhance right to win by removing regulatory barrier to boost financial certainty and return
Target (By 2030)	**Cumulative investment target:** RM7 bil (RM 20 bil for hydro overall)
Malaysia's right-to-win	**Natural resources:** Limited total potential mainly in Peninsular, exact number and location of high potential sites unknown **Know-how:** >60 planned or operational small hydro projects in Malaysia **Regulatory support:** Feed-in-Tariff (FiT) program & Green Investment Tax Allowance (GITA) incentives but long gestation period **Economic potential:** High interest but limited size of project and total potential Low Medium High

FDI potential (By 2030)	**Domestic-led Investment, potential for foreign partnership in aggregated projects** Low-Medium (0-30%)
Rationale of FDI potential	• Largely driven by domestic investment due to familiarity with local regulatory context, existing relationship with local community, access to information for site assessment and selection

Key unlocks	• **Regulatory framework:**
	  • Drive discussion with state agencies to standardise permitting process
	  • Drive discussion with state agencies to establish client charter with maximum lead-time for permitting procedure
	  • Amend current bidding mechanism to incorporate flexibility for uncertainty in permitting timeline – rate revision within acceptable range
	• **Promotion & outreach:**
	  • Matchmake state agencies with private investors for Joint-Venture (JV) in hydro

Source: FGD, Stakeholders interview, BCG analysis

Small Hydropower Key Unlocks| Streamline permitting process through close collaboration with state agencies to bolster financial return & certainty

	Key unlocks identified	Lead
Regulatory framework & governance system	• Accelerate discussion with State agencies to standardise permitting process by 2025	• KPKT/PETRA/SEDA[1]
	• Accelerate discussion with State agencies to establish client charter indicating maximum lead-time for permitting procedure by 2025 (e.g., 18 months)	
	• Amend current bidding mechanism to incorporate flexibility for uncertainty in permitting timeline – e.g., mechanism for rate revision	• SEDA
Incentives, R&D grant, and partnership	• Allocate more FiT quota using RE fund surplus in case of high demand	• SEDA
	• Conduct hydro-geological study to identify high potential sites and publish outcome in public domain	
	• Collaborate with State agencies to declare pre-approved small hydro development zone based on hydro-geological study	
Promotion, awareness & marketing outreach	• Matchmake state agencies with private investors for JV in small hydro (with potential of equity stake for State agencies to align interest)	• MITI/MIDA

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis
[1]Sustainable Energy Development Authority (SEDA)

7 Investment Opportunity - T&D[1] (BESS[2])| Critical to create market mechanism to allow for private investment into BESS, low-medium FDI possible

IO Prioritisation	**Opportunity Gateway –** High economic potential due to ambitious target for Solar PV, however, requires unlock in regulatory mechanism to allow for private investment
Target (By 2030)	**Cumulative investment target:** RM 22 bil
Malaysia's right-to-win	**Natural resources:** No significant reserve in Lithium or Nickel for manufacturing of battery cell **Know-how:** First grid-scale BESS pilot underway, Malaysia ranks 2nd among SEA Utilities in Smart Grid Index **Regulatory support:** Existing regulatory mechanism does not allow for private investment in grid-scale BESS **Economic potential:** NETR estimated ~80GWh of BESS demand by 2050 to cater for VRE penetration in Malaysia grid Low Medium High

FDI potential (By 2030)	**Technical partnership between Foreign BESS Provider and local utility** Low-Medium (0-30%)
Rationale of FDI potential	• No possibility for private investment into grid-scale BESS under current Inverter-Based Resources (IBR) framework due to lack of compensation mechanism and regulatory framework • However, there is potential for Grid-Scale BESS service provider to form technical partnership with local utility or other local players once market mechanism exists
Key unlocks	• **Regulatory framework:** Expedite release of TPA framework to partially recoup grid investment, Establish regulatory framework & market mechanism for private investment into BESS • **Incentives/Grants:** Prioritize allocation of proceed from RE export for grid infrastructure upgrade

Source: FGD, Stakeholders interview, BCG analysis
1. Transmission and distribution (T&D); 2. Battery Energy Storage Systems

T&D (BESS) Key Unlocks| Unlock regulatory barrier to allow and accelerate private investment into grid especially on BESS

	Key unlocks identified	Lead
Regulatory framework & governance system	• Expedite TPA framework release with clear commercial offtake mechanism – e.g., transparent governance, pricing mechanism, data access etc based on willing-seller willing buyer basis	• ST
	• Provide clarity on role of BESS (e.g., Regulated Asset Based (RAB) or not; and establish regulatory framework and market mechanism for investment into grid-scale BESS (e.g., business model, tariff model, site choice)	
	• Consider mandating minimum level of capacity factor in future grid-connected RE	
Incentives, R&D grant, and partnership	• Prioritise allocation of proceed from RE export via ENEGEM for grid infrastructure upgrade with clear earmark allocation	• PETRA/ST
	• Include BESS to be eligible under GITA for business purpose (currently only GITA self consumption)	• MIDA
	• Explore feasibility to provide preferential wheeling charge for low-carbon electron to stimulate RE plant-up	• ST
Infrastructure development, capabilities and technology transfer	• Develop & publish clear guideline and timeline on future expected need of grid-scale BESS	• ST

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis

8 Investment Opportunity - Green Building| Leverage foreign partners to improve technical competency & access to financing to capture EECA[1]

IO Prioritisation	**Quick Win –** Relatively low investment requirement supplemented by high right to win, making this IO one of low hanging fruits to quickly mobilize investment into
Target (By 2030)	**Cumulative investment target:** RM 16 bil **Operational target:** 8% savings against BAU
Malaysia's right-to-win	**Starting position:** Most of Malaysia's buildings are still relatively new which can be easily retrofitted. Upcoming new buildings can also benefit **Know-how:** Average savings by local ESCO[2] is ½ of foreign ESCOs despite similar offerings. Limited scale of offering due to financing challenge **Regulatory support:** EECA mandates energy audit for major energy user and set max energy intensity for big offices **Economic potential:** 2nd highest overall energy consumption per capita in ASEAN presents opportunity, EECA covers 80% of industrial energy usage Low Medium High
FDI potential (By 2030)	**Domestic-led investment with potential for foreign technical partnership to increase technical competency** Medium (~30-40%)
Rationale of FDI potential	• Local players to drive majority of investment due to familiarity with local context, regulatory requirement and long-standing relationships • Foreign players could potentially contribute to capability & knowledge transfer and access to larger capital pool via partnership with local players.
Key unlocks	• **Regulatory framework:** Implement green building code for residential building • **Incentives:** Explore feasibility to offer more favourable financing terms to ESCOs via GTFS (e.g., higher rebate, larger cap, longer financing term), Consider expanding EACG to cover partial rebate for upfront CAPEX of EE project • **Capability:** Define governance system and timeline for proposed ESCOs platform in NETR • **Partnerships:** Promote awareness on importance and positive impact of EE to building owner via more aggressive seminars, roadshows

Source: FGD, Stakeholders interview, BCG analysis

1. Energy Efficiency And Conservation Act (EECA); 2. Energy Service Company (ECSO)

Green Building Key Unlocks | Continue momentum on NETR & EECA to improve financing access, explore feasibility to increase incentives/grant

	Key unlocks identified	Lead
Regulatory framework & governance system	• Study feasibility to extend maximum building energy intensity cap to smaller commercial & residential building (currently applicable to commercial building > 8000 m2 under EECA)	• ST
	• Accelerate development of governance and funding mechanism of ESCOs platform for funding aggregation and capability building – *NETR EE 5*	
Incentives, R&D grant, and partnership	• Study feasibility to increase energy audit grant amount of EACG / requiring minimum retrofit investment as audit grant's acceptance condition	• SEDA
	• Explore feasibility of increasing financing cap and portion of government guarantee for ESCOs under GTFS (current cap at RM 25 million with 10 years tenure)	• MGTC
Infrastructure development, capabilities and technology transfer	• Launch a major EE retrofit initiative amongst government buildings - Identify energy inefficient public buildings and mandate improvement within stipulated timeline – *NETR EE 6*	• KKR[1]
	• Study "local ESCO requirement" for Energy Audit Conditional Grant (EACG) implementation, with possibility of foreign ESCOs participation as technical partner	• ST
	• Explore feasibility to include EE service under GITA for business purpose of Green Income Tax Exemption (GITE) to encourage EE service offering	• MIDA
Promotion, awareness & marketing outreach	• Conduct new round of EACG & EECA roadshow or awareness campaign to promote awareness on benefit of EE and implementation of EECA among C&I owners	• SEDA/ST

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis
Ministry of Works (Kementerian Kerja Raya - KKR)[1]

9 Investment Opportunity - EV (E2W/E4W)| High FDI potential in EV mid-upstream and domestically-driven investment in downstream

IO Prioritization

- **Quick win –** Malaysia has strong right-to-win to secure investments, and investment required is relatively low compared to other IOs

Target (By 2030)

Cumulative investment target:
RM8.5 bil

Operational target:
15% TIV xEV (2W/4W)

Malaysia's right-to-win

- **Natural advantages:** Possess REE[1] reserves which are key raw materials for permanent magnets and sensors
- **Know-how:** Strong auto and semiconductor vendor ecosystem but faced with MNC OEMs competition from Thailand / Indonesia
- **Regulatory support:** Purchase and manufacturing incentives in place but existing charging policies and low EV TCO[2] parity with ICE hinder local uptake
- **Economic potential:** Growth driven by (1) high export demand for REE and smart components, (2) sizeable domestic market with high vehicle ownership

FDI potential (By 2030)

Upstream		Midstream	Downstream	
Raw material extraction & processing	Smart components manufacturing	EV assembly and sales	Charging & swapping infra & services	End-of-life and recycling
High (~50%)	High (~50%)	High (~50%)	Low (~10%)	Low (~10%)

Rationale of FDI potential

- Lower right-to-win in downstream and limited export opportunities, as Malaysia is less attractive to foreign investors relative to Thailand and Indonesia based on starting position from ICE
- Higher right-to-win in upstream and midstream with high export opportunities of REE and smart components, relatively easier to attract FDI

Key unlocks

- **Regulatory framework:** Explore export restrictions of unprocessed REE, adopt targeted fuel subsidy, address regulatory roadblocks e.g., CPO[2] license approval process on highways, increase EV share of gov./commercial fleet
- **Partnership and incentives:** Continue co-funding/concessionary model to upgrade grid, lengthen incentives period to enhance business predictability
- **Capability:** Evaluate REE commercial potential, leverage existing funds to develop REE talent, transition Malaysia's ICE vendor ecosystem to EV with TTA[3]
- **Promotion and outreach:** Explore FTA with high EV manufacturing capacity nations, promote awareness on Environment, Social and Governance (ESG) compliance with key markets' import regulation

1. Rare earth elements 2. Charge Point Operator 3. Technology transfer agreement
Source: FGD, Stakeholders interview, BCG analysis

Low Medium High [x] Upstream [x] Mid-downstream

EV Key Unlocks | Continue domestic EV ramp-up while capitalie on rare earth reserves and semiconductor strengths to capture export opportunities

	Key unlocks identified	Lead
Regulatory framework & governance system	• Explore **export restrictions on unprocessed rare earth elements**[1] (REE) to spur investments into domestic processing and refining sector	• **NRES**[2]**/MITI**
	• **Adopt targeted fuel subsidy** to increase EV Total Cost of Ownership (TCO) parity with ICE vehicles	• **MOF**
	• **Reduce regulatory challenges** in ramping up EV adoption including charging infrastructure rollout (e.g., right-to-charge law, approval process for charge point operator license on highways)	• **MITI**
	• Gradually increase **mandatory EV share of government fleet** including GLC	
Incentives, R&D grant, and partnership	• Continue **co-funding** and explore **concessionary model** to upgrade grid capacity for public charging infrastructure rollout	• **MITI**
	• **Lengthen incentives period** to enhance business **cash flow predictability** and encourage sustained investments	• **MITI/MOF**
Infrastructure development, capabilities and technology transfer	• **Leverage start-up fund (RM100 mn) under MIGHT for REE talent development program**	• **MOSTI**
	• **Evaluate REE commercial potential and develop plans to enhance domestic tech competency** to capture trade opportunities **leveraging REE reserves and semiconductor strength**	• **MITI**
	• **Facilitate transition of Malaysia ICE vendor and manufacturing ecosystem to EV** leveraging technology transfer agreements	
Promotion, awareness & marketing outreach	• **Define Malaysia's value proposition and explore FTAs** with high EV demand and manufacturing capacity nations on relevant EV components, such as USA	• **MITI**
	• Promote awareness about the importance of **ESG principles compliance** with key markets import regulation	

[1]Ongoing exploratory efforts on assessing Malaysia's REE potential by NRES
Source: FGD discussion, Stakeholders interview, NETR, BCG analysis

[2]Ministry of Natural Resources and Environmental Sustainability (NRES)

Upstream | Mid-down stream

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Investment Opportunity - Marine (Biodiesel, HVO[1], and alternative fuel)| Medium FDI to expand biodiesel and HVO capacity, monitor future fuel development

IO Prioritization	**Opportunity gateway –** Malaysia has moderate right-to-win to secure investments, and investment required is relatively low compared to other IOs
Target (By 2030)	**Cumulative investment target:** RM11 bil **Operational target**: 20-30% GHG reduction p.a. vs. 2008[1]
Malaysia's right-to-win	**Natural advantages:** Biodiesel/HVO commercially viable with sufficient feedstock in Malaysia for domestic consumption and export **Know-how:** Existing local biodiesel producers; O&G players are capable to produce HVO by retrofitting refineries **Regulatory support:** B10 (small ships), B7 (coastal ships) program[2] in place **Economic potential:** High bunkering demand shows potential but unclear consensus on future clean fuel e.g. green methanol and ammonia Low Medium High

FDI potential (By 2030)	**Focus on domestic production capacity expansion for local consumption and capture export opportunities** Medium (~30%)
Rationale of FDI potential	• Investment from local biorefineries/O&G refineries in biodiesel/HVO production • Potential investment from local and international methanol producers when demand for green methanol marine fuel is proven • Investment potentially required to upgrade port/bunkering facilities to capture demand for current and future fuels
Key unlocks	• **Regulatory framework:** Continue enforcing B7/B10 nationwide for adoption of biofuels in domestic shipping industry, reinforce TPA agreement to allow more biomethane transmission for potential green fuel production • **Incentives:** Enhance competitiveness of domestic ports for bunkering, accelerate scale-up of green fuel production subject to future fuel demand • **Technology:** Support research on improving technical feasibility and commercial viability of biofuels for marine bunkering • **Awareness:** Keep track of alternative fuels[3] development and assist domestic ships to adopt future fuels when commercial viability is achieved

[1]Hydrotreated Vegetable Oil, [2]In line International Maritime Organization (IMO) targets, as outlined in the 2023 IMO GHG Strategy 2. B10 is exclusively utilized by fisherman's boats and passenger ferries due to its classification within the subsidized sectors. Coastal ships are obligated to utilize B7, which belongs to non-subsidized sectors 3. Green methanol and ammonia

Source: FGD, Stakeholders interview, BCG analysis

Marine Key Unlocks | Strong regulatory support required to capture market opportunities of biofuel and future fuel

	Key unlocks identified	Lead
Regulatory framework & governance system	• Continue **enforcing B7/B10 nationwide** for adoption of biofuels in domestic shipping industry	• **KPK[1]**
	• **Reinforce TPA agreement** to allow more biomethane transmission for potential green fuel production i.e. bio-methanol	• **ST**
Incentives, R&D grant, and partnership	• **Enhance competitiveness of ports for bunkering** e.g. lower bunkering cost	• **MOT[2]**
	• **Accelerate scale-up of green fuel production,** subject to future fuel demand	
Infrastructure development, capabilities and technology transfer	• Support research on **improving technical feasibility and commercial viability of biofuels** for marine bunkering	• **KPK**
Promotion, awareness & marketing outreach	• **Keep track and selectively adopt pilot projects** for future fuels and determine country strategy for these fuels as commercial viability is reached	• **MOT**
	• **Develop plan for domestic coastal ships to adopt future fuels** in the medium- to long-term i.e, vessel and engine adjustment	

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis
[1]Ministry of Plantation and Commodities, [2]Ministry of Transport (MOT)

11 Investment Opportunity - Aviation (SAF[1])| Medium FDI to build SAF production capabilities and prepare to scale and capture export opportunities

IO Prioritization	**Emerging frontier –** Malaysia has low right-to-win to secure investments, and investment required is relatively low compared to other IOs
Target (By 2030)	**Cumulative investment target:** RM4 bil **Operational target**: 1-5% blending mandate
Malaysia's right-to-win	**Natural advantages:** MY expected to have sufficient feedstock (mainly Used Cooking Oil - UCO) to meet NETR 2030, but CPO-based SAF have limited GHG reduction[2] **Know-how:** O&G players have capabilities; ~3 SAF plants announced planned production capacity in Malaysia **Regulatory support:** Blending mandate yet to be implemented **Economic potential:** Market expected to be oversupplied in the short-term, potential export markets uncertain; EU plans to phase out CPO-based biofuel, US is evaluating CPO compliance with its Renewable Fuels Standard

FDI potential (By 2030)	**Focus on domestic production capacity expansion and opportunistically capture export opportunities on palm/non-palm based SAF** Medium (~30%)
Rationale of FDI potential	• Domestic O&G refineries possess strong foundation to produce SAF due to capital expenditure advantage where they require lower initial investment by retrofitting existing hydro-processing plant • Foreign investment might be required depending on selected SAF technology pathway, existing distribution network, and risk appetite
Key unlocks	• **Regulatory framework:** Implement blending mandate as per NETR, launch Malaysia Aviation Decarbonization Blueprint, consider export levy on feedstock to retain domestic volume e.g. UCO • **Partnership:** Facilitate private offtake programs and integration of SAF producers with feedstock suppliers, initiate outreach when opportunities emerge e.g., G2G • **Technology and capabilities:** Ongoing tech development, distribution network expansion and diversification of feedstock pool • **Promotion and awareness:** Obtain re-evaluation of CPO GHG emission from key markets' authorities, continue to ensure sustainable sourcing of CPO

[1]Sustainable Aviation Fuel, [2]Due to high ILUC rate
Source: FGD, Stakeholders interview, BCG analysis

Low Medium High

Aviation Key Unlocks | Regulatory support and capability building required to capture SAF market opportunities

	Key unlocks identified	Lead
Regulatory framework & governance system	• Establish SAF blending mandate as per NETR and develop a comprehensive framework for progressive escalation in the long run	• KPK
	• Accelerate establishment of overarching aviation decarbonisation roadmap to outline policy intervention and milestone	• MOT
	• Consider export levy on feedstock to retain domestic volume e.g. UCO	• MITI
Incentives, R&D grant, and partnership	• Facilitate private offtake programs and integration of SAF producers with feedstock suppliers	• MOT
	• Monitor global SAF development and proactively initiate outreach when opportunities emerge e.g. G2G	• MITI
Infrastructure development, capabilities and technology transfer	• Assist SAF producers in tech development, distribution network expansion and diversification of feedstock pool	• KPK
Promotion, awareness & marketing outreach	• Obtain re-evaluation of CPO GHG emission due to Indirect Land Use Change (ILUC) charges from key markets' authorities	• KPK
	• Continue ensuring that palm oil for SAF production is sourced in a sustainable manner	

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis

12 Investment Opportunity - Biomass and Biogas Power| Investment mainly domestically driven to consolidate synergies among local players

IO Prioritization	**Opportunity gateway –** Malaysia has a moderate starting position to win investments; investment target is low as per NETR
Target (By 2030)	**Cumulative investment target:** RM2 bil **Operational target**: 500MW installed capacity
Malaysia's right-to-win	**Natural advantage:** Malaysia has significant untapped potential of palm-based biomass/biogas, though biogas potential volumes are not meaningful to replace natural gas as per NETR **Know-how:** Existing capabilities to adopt biomass and biogas power **Regulatory support:** Current Imbalance Cost Pass-Through - ICPT mechanism and lack of carbon tax leads to unattractive economics **Economic potential:** Available coal plants until at least 2040 can be used for co-firing initiatives but it can be limited in potential Low Medium High

FDI potential (By 2030)	**Focus on domestic uptake and explore export opportunities** Low (~10%)
Rationale of FDI potential	• Biomass and biogas power: Low bankability; uptake mainly driven by FiT quota allocated to local biomass and biogas plant operators • Co-firing: Synergies between coal power plants and palm oil millers to be unlocked through partnerships • Biomass pellet and biomethane: Export potential to key markets (Singapore, Japan)
Key unlocks	• **National-level regulatory framework:** Adopt carbon pricing mechanism to improve biomass and biogas economics • **Biomass/Biogas-specific regulatory framework:** Review ICPT mechanism, consider export levy on feedstock e.g. Palm Kernel Shell - PKS, and reinforce TPA agreement to allow export of biomethane to key market e.g. Singapore • **Incentives and partnership:** Increase FiT quota when needed, facilitate long-term partnership between biomass/coal plant operators and palm oil millers • **Infrastructure:** Upgrade nodal points to allow biomass and biogas plants to supply electricity to the grid for additional income, therefore higher adoption

Source: FGD, Stakeholders interview, BCG analysis

Biomass and Biogas Power Key Unlocks | Strong regulatory support required to enhance uptake

	Key unlocks identified	Lead
Regulatory framework & governance system	• Accelerate rollout of carbon pricing and review ICPT mechanism to improve biomass and biogas power economics	• MOF/KPK
	• Consider export levy on feedstock e.g., PKS to retain domestic volume for power generation when domestic biomass and biogas power economics improve	• MITI
	• Reinforce TPA agreement to allow export of biomethane to key market e.g., Singapore	• ST
Incentives, R&D grant, and partnership	• Facilitate long-term partnership between biomass/coal plant operators and palm oil millers to ease feedstock aggregation, hence feedstock security	• KPK
	• Increase FiT quota when needed and facilitate incentives for co-firing in coal power plant	• SEDA/KPK
Infrastructure development, capabilities and technology transfer	• Identify nodal points where upgrades are needed to allow more biomass and biogas plants to supply electricity to the grid for additional income stream, therefore higher adoption	• KPK

Source: FGD discussion, Stakeholders interview, NETR, BCG analysis

13 Investment Opportunity - Industrial Waste Management| Regulatory fixes necessary before investments, foreign technological expertise required

IO prioritisation	**Emerging Frontier –** Low priority due to relatively low investment target and strong unlocks required
Target (By 2030)	**Cumulative investment target:** RM19 bil
Malaysia's right-to-win	**Natural resources:** Abundance of critical raw materials, potential restricted by regulatory issues **Know-how:** Currently poor as main solution is landfilling, ongoing efforts to improve via incineration but still not sound **Regulatory support:** Act 672 hardly adopted, planned CE framework implementation in Q3 2024 **Economic potential:** Potential due to raw materials can be captured, but must avoid landfilling and waste imports

FDI potential (By 2030)	**Technology transfer investment** Low-Medium (0-30%)
Rationale of FDI potential	• Foreign partnership and investments needed to bring in advanced technological expertise for scaling and efficiency purposes • Still mostly domestic play due to nature of waste management. Players to continue efforts and investments in collection, sorting and proper disposal
Key unlocks	• **Regulatory framework** Enforce mandatory Extended Producer Responsibility (EPR) adoption to ensure waste is reduced or recycled, develop national CE metric & tracking mechanism to better understand domestic waste flow and resolve pain points • **Infrastructure development:** Develop Digital waste-to-value marketplace to generate demand and supply market of waste

Source: FGD, Stakeholders interview, BCG analysis

Low Medium High

Industrial Waste Mgmt. Key Unlocks| Build on initiatives in CE framework, with emphasis on unlocks which resolves structural gaps and issues

	Key unlocks identified	Lead
Regulatory framework & governance system	• Drive mandatory EPR adoption to track and reduce waste production from manufacturers	• MITI/KPKT[1]/DOE[2]
	• Develop guidelines for manufacturer on classification of non-hazardous industrial output/waste	• MITI/KPKT
	• Develop standardised CE certification for labeling and reporting with defined criteria	• SIRIM/MGTC
	• Build national CE metric and tracking mechanism to monitor waste collection, building performance indicators and assigning responsibilities to relevant parties	• MITI/DOSM
Infrastructure development, capabilities and technology transfer	• Develop digital waste-to-value marketplace between manufacturers including a directory of waste/byproduct itemized by wasted categories	• MITI/WMAM[3]
	• Launch upskilling program to develop CE capabilities, including key technical skills developed in partnership with international partners with certification for graduation	• MITI/MGTC
Promotion, awareness & marketing outreach	• Promote and drive CE activities in ASEAN to implement framework and connect private sector with Malaysia as regional chair. Ensure implementation ramp up of CE Framework and push for regional standards and targets	• MITI

Source: Stakeholders interview, Circular Economy Framework
[1]Department of Environment (DOE), [2]Department of Statistics Malaysia (DOSM) [3]Waste Management Association of Malaysia (WMAM)

14 Investment Opportunity - Recycling & Advanced Recycling| Regulatory fixes necessary before investments, foreign technological expertise required

IO prioritisation	**Emerging Frontier –** Low priority due to relatively low investment target and strong unlocks required
Target (By 2030)	**Cumulative investment target:** RM7 bil
Malaysia's right-to-win	**Natural resources:** Abundance of critical raw materials with potential for recycling, restricted by regulatory limitations **Know-how:** Currently fragmented with small players that focus on manual sorting **Regulatory support:** EPR currently being piloted, planned CE framework implementation in Q3 2024 **Economic potential:** Global market trend shifting towards recycling, but Malaysia is ill-prepared to capture at present Low Medium High

FDI potential (By 2030)	**Technology transfer investment** Low-Medium (0-30%)
Rationale of FDI potential	• Foreign partnership and investments needed to bring in advanced technological expertise for scaling and efficiency purposes • Still mostly domestic play due to nature of recycling. Existing players to continue efforts and investments in high quality recycling, avoid low level manual efforts
Key unlocks	• **Regulatory framework** Implement minimum circular content requirements to ensure demand for recycled materials grow and supply of recyclates are present, enforce mandatory EPR adoption to ensure packaging recycled • **Infrastructure development:** Develop Digital waste-to-value marketplace to generate demand and supply market of recyclates

Source: FGD, Stakeholders interview, BCG analysis

Recycling & Advanced Recycling Key Unlocks | Build on initiatives in CE framework, with emphasis on generating local supply & demand

	Key unlocks identified	Lead
Regulatory framework & governance system	• Implement **minimum content requirements** to increase rate of recycling	• **MITI/NRES**
	• Drive **mandatory EPR adoption** to track and reduce waste production from manufacturers, assigning responsibility for end-of-life management of products	• **MITI/KPKT/DOE**
	• Develop guidelines for manufacturer on **classification of non-hazardous industrial output/waste**	• **MITI/KPKT**
	• Develop **standardised CE certification** for labeling and reporting	• **SIRIM/MGTC**
	• Develop **CE taxonomy** to channel investments, fiscal, and financial instruments	• **MITI/SC[1]**
	• Support **export of goods** with CE requirements	• **MATRADE[2]/MIDA**
Incentives, R&D grant, and partnership	• Continue to progress on **RM200 mil investment advocation** under the Investment Framework on National Technology Development for the development of the biodegradable product industry	• **MOSTI**
Infrastructure development, capabilities and technology transfer	• Develop digital **waste-to-value marketplace** between manufacturers including a directory of waste/byproduct to establish trading partnership for recyclates to producers	• **MITI/WMAM**
	• Launch **upskilling program** to develop CE capabilities, including key technical skills developed in partnership with international partners with certification for graduation	• **MITI/MGTC**
Promotion, awareness & marketing outreach	• Promote and **drive CE activities in ASEAN** to implement framework and connect private sector	• **MITI**
	• Promote **circular business models** to increase recyclability	• **MITI/MIDA**

Source: Stakeholders interview, Circular Economy Framework
[1]Securities Commission Malaysia (SC), [2]Malaysia External Trade Development Corporation (MATRADE)

15 Investment Opportunity - Remanufacturing & Refurbishment| Potential focus on new emerging sectors

IO prioritisation	**Opportunity Gateway** – Medium priority due to high investment target but right-to-win improvement needed
Target (By 2030)	**Cumulative investment target:** RM38 bil
Malaysia's right-to-win	**Natural resources:** Ample supply and potential in emerging sectors but restricted by incoming regulation and lack of recognition **Know-how:** Established in mature markets but limited in new high growth areas **Regulatory support:** Regulated standards exist, but could be improved with enforcement **Economic potential:** Lever adoption already present and has potential to improve and expand in new areas Low Medium High

FDI potential (By 2030)	**Technology transfer investment** High (~50%)
Rationale of FDI potential	• Players are obliged to invest due to necessity or requirement of business norms. Additional opportunity present in new growing emerging sectors • Local existing players to continue investments as individual sector demand grows. Possible participation in new growing emerging sectors too
Key unlocks	• **Regulatory framework** Implement minimum circular content requirements to ensure remanufacturing and refurbishment practice is adopted, standardise CE certification for labelling and reporting, develop CE taxonomy to recognise remanufacturing and refurbishment efforts and investments

Source: FGD, Stakeholders interview, BCG analysis

Remanufacturing & Refurbishment | Build on initiatives in CE framework, with focus on taxonomy for recognising remanufacturing & refurbishment

	Key unlocks identified	Lead
Regulatory framework & governance system	• Implement minimum content requirements to increase rate of remanufacturing	• MITI/NRES
	• Drive mandatory EPR adoption for manufacturers, assigning responsibility for end-of-life management of products to improve product	• MITI/KPKT/DOE
	• Develop standardised CE certification for labeling and reporting to label remanufacturable and refurbishable products fit into existing framework such as SIRIM's eco-labelling and MyHijau	• SIRIM/MGTC
	• Develop CE taxonomy, defining sectors to channel investments, fiscal, and financial instruments	• MITI/SC
	• Support export of goods with CE requirements	• MATRADE/MIDA
Infrastructure development, capabilities and technology transfer	• Develop digital waste-to-value marketplace, including a directory of waste/byproduct with possibility to be remanufactured to improve supply	• MITI/WMAM
	• Launch upskilling program to develop CE capabilities of remanufacturing and refurbishment developed in partnership with international partners with certification for graduation	• MITI/MGTC
Promotion, awareness & marketing outreach	• Promote and drive CE activities in ASEAN to implement framework and connect private sector	• MITI
	• Promote circular business models to increase refurbishable products	• MITI/MIDA

Source: Stakeholders interview, Circular Economy Framework

Green Investment Strategy

Cross-cutting Enablers

Cross Cutting Enablers| Collaborative efforts required to support Green Investment aspirations

		Key actions	Lead	Key supporting ministries
1	Green investment promotion: Leverage green narrative to market Malaysia as prime Green Investment destination	• Focus on targeted **G2G negotiations** • Leverage **upcoming platforms** for Green Investment promotion	• MITI	• KE • MOSTI • NRES
2	Fiscal and financial incentives: Implement targeted incentives while balancing growth potential and budgetary prudence	• **Enhance existing** and **introduce novel catalytic financing instruments** • **Introduce carbon pricing** to price in externalities of emissions	• MOF	• MITI
3	Integrated Development: Develop Green levers collectively to catalyse investment and infrastructure buildout for accelerated technology adoption	• Leverage planned **industrial parks as flagship projects** to pilot cross-lever connections • **Enhance governance and incentives** to attract green investors into industrial park	• MITI	• KE • MOSTI
4	Talent and capabilities: Cultivate domestic green talent pool and bolster institutional capabilities to support Green Investment	• Mass **talent upskilling and retention initiatives** • **Capability building for Government of Malaysia** • **Cascade Green Investment narrative throughout MIDA**, **upgrade technical expertise**	• MOHR • MITI • MIDA	• KE • MOSTI
5	Governance: Ensure effective acceleration of Green investment strategies, leveraging whole of government approach	• **Green Investment Delivery Management Unit (DMU)** as a working committee to oversees the implementation of GIS • **DMU** shall **report to the Steering Committee** on Green Investment	• MITI • PETRA • MIDA	Whole-of-Government

MINISTRY OF
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