



Ministry of Energy Transition  
and Water Transformation



# Transforming the Energy Landscape:



Accelerating Bio Circular Economy with Clean  
Energy and AI Driven Energy Efficiency

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# Key Policy Frameworks

Promotes sustainable development by transitioning from a linear "take-make-use-return" model to a circular, bio-based economy by adopting the waste-to-wealth



- Circular Economy Framework
- Circular Economy Blueprint for Solid Waste



- National Biomass Action Plan 2023-2030
- National Biotechnology Policy



- National Energy Transition Roadmap (NETR)
- National Energy Efficiency Action Plan (NEEAP)
- National Renewable Energy Action Plan (NREPAP) & Roadmap (MYRER)



# Towards Achieving Sustainable Energy Transition

## Climate Change and Principle-based Taxonomy

Optimise



Energy Efficiency

Shift to Renewables



Renewable Energy



Hydrogen



Bioenergy



Green Mobility

Abate



Carbon Capture,  
Utilisation and  
Storage

## Energy transition levers

## Prioritisation criteria

- + **Emission reduction potential**  
Advancing green growth and enhancing sustainability to become a low-carbon nation while addressing energy trilemma.
- + **Economic opportunities**  
Propelling strategic and high impact industries, especially for SMEs, strengthening investments and create job opportunities.
- + **Cost effectiveness**  
Promoting investments, especially in nascent technologies to yield long-term benefits.
- + **Social inclusiveness**  
Strengthening the security, wellbeing and inclusivity through clean energy sources that would benefit communities without compromising future generations.



MINISTRY OF ECONOMY

## National Energy Transition Roadmap

Energising the Nation, Powering Our Future



# NETR Initiatives & Potential Investments

Sector and Key Driver		2040 DTN Low Carbon Nation Asp.	2050 NETR Responsible Transition
EE Energy Efficiency	Industry and Commercial energy efficiency savings (%)	11%	23%
	Residential energy efficiency savings (%)	10%	20%
RE Renewable energy	Coal share of installed capacity (%)	19%	0%
	RE share of installed capacity (%)	41%	70%
HY Hydrogen	Green hydrogen production (MTPA)	N/A	Up to 2.5 MTPA
	Grey hydrogen feedstock phase off (%)	N/A	100%
	Hydrogen hubs (#)	N/A	3
BI Bioenergy	Biofuel capacity (billion litres)	N/A	3.5
	Bioenergy power generation (GW)	N/A	1.4

	2030	2040	2050
Energy Efficiency	-RM2 b in smart devices installation -RM2 b into retrofitting gov. buildings	-RM6 b in smart devices installation -RM7 b into retrofitting gov. buildings	-RM7 b in smart devices installation
Renewable energy	-7GW of solar PV (31% RE of installed capacity)	-27GW of solar PV (52% RE of installed capacity)	-57GW of solar PV (70% RE of installed capacity)
Hydrogen	Establishment of 1 hydrogen hub	Establishment of 2 additional hubs	Up to 2.5MTPA local green H <sub>2</sub> production
Bioenergy	0.6 billion litres of biofuel production -500 MW of bioenergy installed capacity	1.8 billion litres of biofuel production -600 MW of bioenergy installed capacity	3.5 billion litres of biofuel production -1,400 MW of bioenergy installed capacity
Green Mobility	20% of 4W fleet as xEVs	20% of 2W fleet electrified	50% of 4W fleet as xEVs 50% of 2W fleet electrified
CCUS	3 CCUS hubs	Up to 15 MTPA of CO <sub>2</sub> storage capacity	1 carbon capture hub 40 MTPA of CO <sub>2</sub> storage capacity

# ✦ Renewable Energy Deployment ✦



**Large Scale Solar (LSS) – Rollout of new utility scale solar projects to meet 2GW target**

**Solar ATAP – Introduce new guidelines allowing residential and commercial users to export excess energy back to the grid for bill credits**

**Corporate Renewable Energy Supply System (CRESS) – direct contract with RE developers for renewable electricity via national grid**

**Battery Energy Storage System (BESS) – to support RE goals**

# ✦ Biofuels and Bioenergy ✦

- Second generation feedstock is seen as the current most favourable bioenergy feedstock
- Focus on two (2) key segments: agriculture-related bioenergy (palm oil) and non-agriculture waste (MSW)
- Producing renewable electricity and sustainable aviation fuel (SAF)
- These efforts support energy security by introducing bioenergy as an alternative fuel for power generation and as a means for rural electrification via local microgrids



# Business case :



## The Lepar Hilir Biogas Project

- capturing methane from POME and converting that waste into 1.5MW of consistent, renewable electricity fed directly into the national grid.

## Sustainable Aviation Fuel (SAF)

- Sarawak is pioneering the use of microalgae to produce SAF.
- By 2050, Malaysia aims to have a biorefinery capacity of 3.5 billion litres.



# ✦ AI-Driven Energy Efficiency ✦



**1**

Building Automation and Optimisation System using passive and active design building, Energy Management Systems (EMS) and Sensor & Predictive Maintenance

**2**

Smart Appliances and Apps such as installation of Smart Meters and usage of apps to monitor usage and behavioural change

**3**

The use of AI drive the increase of electricity consumption and will create significant pressure on local water and power infrastructure in the long run

# ✦ Energy Intensity Reduction ✦

- Continue to strive for energy intensity reduction through NETR initiatives
- Further implement EE initiatives and enforce Energy Efficiency and Conservation Act (EECA) which was adopted on 1<sup>st</sup> January 2025, to mandate high energy users to audit and reduce energy consumption
- Introduction of new Climate Change Act
- Introduction of Carbon Tax





## Conclusion

Under NETR, Malaysia recognize the importance of energy sector as a primary driver of the economy's GDP. Therefore, the economy will continue to address hurdles and bottlenecks in order to support effective energy transition in Malaysia.



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# Thank You

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