

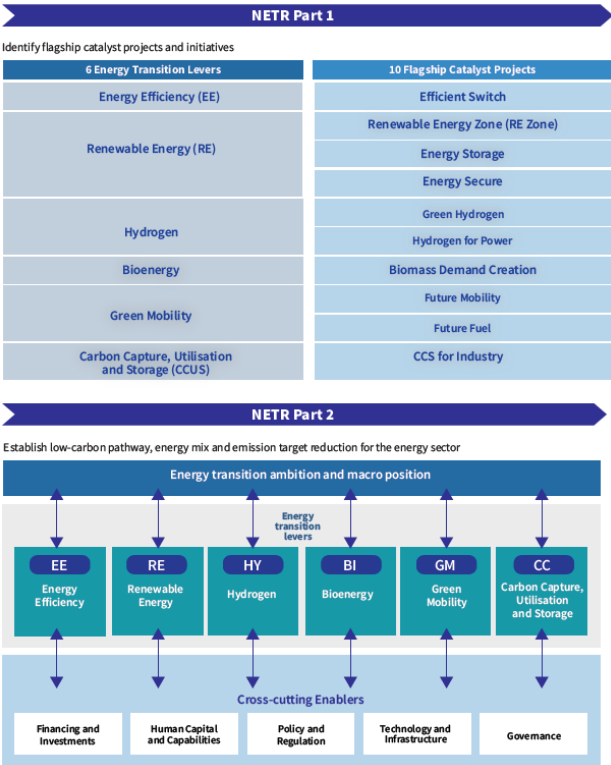
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Malaysia's National Energy Transition Roadmap: Part 2 (Roadmap in Full)

Introduction

Part 1 of the National Energy Transition Roadmap ("**NETR**") was launched by the Ministry of Economy of Malaysia ("**Ministry of Economy**") on 27 July 2023, outlining ten flagship catalyst projects and initiatives based on six energy transition levers – (i) energy efficiency ("**EE**"); (ii) renewable energy ("**RE**"); (iii) hydrogen; (iv) bioenergy; (v) green mobility; and (vi) carbon capture, utilisation and storage ("**CCUS**"). Please click [here](#) for our write-up on Part 1 of the NETR.

Part 2 of the NETR was announced on 29 August 2023, which was essentially an introduction of the NETR in full and an introduction of, among others, the six levers and five enablers needed for the country's energy transition. This Update sets out some of the key points of Part 2 of the NETR in brief.



Source: NETR

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Review of RE policies

In developing the NETR, the following decisions have been made by the Government of Malaysia:

- to increase the country's installed RE capacity from 40% in 2035 to 70% by 2050;
- to introduce the concept of a **self-contained system according to the "willing buyer, willing seller" principle** to the RE development framework;
- to increase the installation of solar systems on government buildings; and
- to allow **cross-border RE trade** through the establishment of an electricity exchange system, complementing the ASEAN power grid initiative.

Another key takeaway from the NETR is that the Government intends to reform the power sector by establishing a third-party access ("**TPA**") framework to supply fuel sources, and **broaden access to the grid infrastructure** (possibly in the form of smart grid and/or TPA to the grid system) and the retail market.

Energy system pathway

The NETR anticipates that the country's responsible transition pathway will achieve the following by 2050:

- increased use of RE in the power generation mix;
- close to fully phased-out coal from the power generation mix;
- broad based energy efficiency initiatives pursued, particularly from the demand side management that include optimising energy consumption across key sectors, namely residential, commercial, industrial, and transport to prevent wastage and indirectly prolong the lifespan of indigenous resources; and
- shift to electrification and biofuels expedited in the transport sector.

Levers

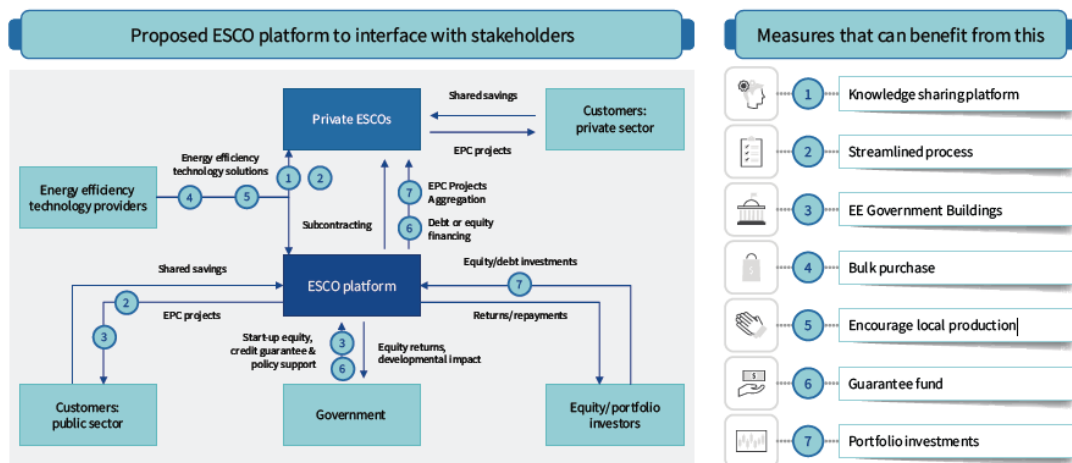
Part 2 of the NETR saw the Government elaborate on the six levers announced during Part 1 of the NETR. Among the highlights are the proposed implementation of an energy service companies ("**ESCO**") platform, establishment of solar parks, development of a TPA framework and setting up of an RE exchange hub to enable cross-border RE trading, establishment of hydrogen hubs, facilitating of biomass clustering, imposition of landfill tax, quota and/or ban, and introduction of regulations and formulation of carbon pricing instruments for CCUS projects.

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- Energy Efficiency

The Government views EE as the most important lever as it promotes resource optimisation and offers a cost effective and long-term solution to lower energy intensity. The NETR proposes to achieve energy savings of 22% by 2050, which is almost double the target proposed under the National Energy Policy announced a year ago. The Government intends to implement the following key initiatives to achieve the target:

- Improve EE awareness.
- Improve existing minimum energy performance standards and 5-star rating bands.
- Enforce **mandatory audits for large commercial and industrial buildings**.
- Establish green building codes for energy-intensive residential and commercial buildings.
- Launch a major EE retrofit initiative amongst government buildings.
- Establish an ESCO platform to coordinate public building retrofits with private ESCOs and to streamline funding and create a single financial mechanism in the form of a revolving fund through ESCO platform. The proposed structure is as follows:



Source: NETR

- Renewable Energy

Transitioning to low-emission RE is central to the energy transition narrative. To that end, the Government targets to achieve 70% RE installed capacity in the power mix by 2050 and commits for no new coal power plants to be developed. The Government acknowledges that challenges faced by large-scale solar developers – essentially, regulatory barriers, policy inconsistencies and infrastructure constraints/grid limitations – have hindered the sector's scalability and efficiency. The six key initiatives proposed by the NETR to address these issues are:

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- **Establish solar parks** for accelerated deployment of utility-scale solar. For instance, the Government announced during Part 1 of the NETR an integrated RE zone to be championed by Khazanah Nasional Berhad and solar parks to be championed by Tenaga Nasional Berhad.
 - **Promote floating solar and agrivoltaic technology.** This will entail removing existing regulatory barriers inhibiting and rolling out clear guidelines to facilitate floating solar projects.
 - Expand **virtual aggregation model for rooftop solar.**
 - Develop plan for accelerated investments for grid infrastructure and incentivise the usage of power storage facilities.
 - **Develop TPA framework** with transparent mechanism for wheeling fee calculation to bridge demand-supply gap for green electricity and to allow solar developers amongst Corporate Green Power Programme (CGPP) to sell excess power to a Single Buyer.
 - Set up **RE exchange hub to enable cross-border RE trading.** This will involve the Government developing regulations for implementation of the RE exchange hub and cross-border RE trading, establishing of new or upgrading current interconnectors with neighbouring countries, and establishing an entity to function as the market aggregator.
- Hydrogen

Building on the progress in Sarawak where the state is collaborating with Japanese and South Korean partners to tap into the potential of hydrogen, the NETR proposes to completely phase out the use of grey hydrogen as feedstock by 2050, to produce up to 2.5 Mtpa of green hydrogen by 2050 and to establish a low-carbon hydrogen hub by 2050 and an additional two hubs by 2050. The main challenges in developing this sector are the limited supply of equipment, lack of technical expertise and the high costs to produce green hydrogen, not to mention the lack of policy support and uniform standards and regulations. Thus, the Government intends to:

- **Establish low-carbon hydrogen standards and regulations,** including establishing domestic guarantee of origin certification to meet the standards of importing countries, introducing hydrogen-specific regulations relating to transportation and storage, and streamlining permitting process for hydrogen projects for expedited approval.
- Develop domestic green electrolyser manufacturing capabilities.
- Reduce Levelized Cost of Hydrogen (LCOH) for low-carbon hydrogen. This is to be achieved by **establishing hydrogen hubs** to optimise economics of low-carbon hydrogen and to offer financial incentives for the manufacture of hydrogen-related equipment.
- Stimulate demand for low-carbon hydrogen by, among others, exploring bilateral agreements with key importing countries and providing incentives for development of hydrogen refuelling stations and purchase of hydrogen fuel cell vehicles.

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- Bioenergy

Bioenergy (covering biomass, biogas and biofuels) offers a key source of renewable primary energy supply, and biomass and biogas are used as zero-carbon energy supply sources for power generation. The NETR aims to capitalise Malaysia's strong bioenergy potential by focusing on agriculture-related bioenergy and non-agriculture waste such as used cooking oil ("**UCO**") and municipal solid waste. The NETR targets to increase Malaysia's biorefinery capacity to 3.5 billion litres by 2050 and increase biomass and biogas power generation capacity to 1.4GW by 2050. The key initiatives to achieve this would be to:

- Explore alternative bioenergy feedstock, such as bamboo or algae.
- Enhance attractiveness of palm oil biomass, such as obtaining sustainable aviation fuel ("**SAF**") certification from international bodies.
- Address challenge of supply security by **facilitating biomass clustering** to catalyse aggregation and reduce aggregation cost, and to scale-up UCO collection.
- Catalyse local demand for bioenergy, for instance by establishing SAF blending mandates and mandates for land transport. The Government may also consider providing incentives through feed-in tariff for co-firing in coal power plants.
- Improve solid waste management policies. The Government will explore **landfill tax, quota and/or ban to drive reduction in open landfills**, and consider co-funding of waste-to-energy plants to ensure financial sustainability.

- Green mobility

Transportation remains a prominent contributor to greenhouse gas emissions in Malaysia, primarily driven by the emissions from internal combustion engine (ICE) vehicles. Amongst the NETR's aims are to elevate the public transport modal share to 60%, embrace emerging regional benchmarks for fuel efficiency and maintain blending targets, adopt the International Civil Aviation Organization (ICAO) goal of net-zero carbon emissions by 2050 for international aviation, and have low-carbon fuel penetration of 40% in marine transport by 2050. Among the key initiatives proposed for this aspect are:

- Drive public transport modal share shift to 40% by 2040 and 60% by 2050, improve light vehicle fuel economy and accelerate electrification of light vehicles segment.
- Enhance demand-side management with fuel economy, implement B30 biodiesel blending mandate and introduce future powertrains for heavy vehicles.
- Establish overarching aviation decarbonisation roadmap and implement SAF blending mandate.
- Unlock market opportunities of biofuel and future fuels in marine bunkering.

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- Carbon Capture, Utilisation and Storage

CCUS plays a pivotal role in the energy transition locally and globally. In line with global trends of building up CCUS ecosystem using a cluster/hub strategy, the NETR proposes, by 2030, to develop three CCUS hubs (two in Peninsular Malaysia and one in Sarawak) with total storage capacity of up to 15 Mtpa, and by 2050, to develop three carbon capture hubs with total storage capacity of between 40 to 80 Mtpa. Due to CCUS's nascent status, there is a lack of regulatory clarity, incentives and funding required to successfully implement a CCUS project. The Government key initiatives in this regard would be to:

- **Develop specific policies and regulations** to facilitate the implementation of CCUS project.
- Strengthen CCUS adoption through provision of incentives across all relevant sectors and facilitate hub development, such as **establishing carbon pricing instrument** to drive the adoption of carbon capture technology for stationary emitters.
- **Facilitate CCUS hub infrastructure development** by collaborating with potential investors and financiers to fund and catalyse investments in CCUS infrastructure for hub development.
- Negotiate and introduce **transboundary CO2 regulatory agreement** encompassing the provisions on transboundary movement and storage of carbon, liability and cost sharing.
- Promote local utilisation of CO2 in industry.

Enablers

A series of enablers and initiatives have been proposed under the NETR to expedite Malaysia's energy transition journey.

- Financing and Investments

The NETR anticipates that Malaysia will require an investment of at least RM1.2 trillion by 2050 to finance energy transition initiatives. Energy transition projects are generally capital-intensive, with challenges in obtaining financing coming from questions marks about the bankability, commercial viability and even the scale of the project (smaller projects finding it difficult to attract attention). Among the key initiatives proposed by the NETR to address these issues are as follows:

- The Ministry of Economy to launch a **national energy transition facility** with an initial seed fund amounting to RM2 billion.
- Government agencies to mobilise and attract private capital for energy transition sectors.
- The rolling out of a phased and meticulously calibrated **carbon pricing mechanism**.

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- Policy and Regulation

The NETR places a focus on balancing energy equity for allow-income households while striving for reduced reliance on fossil fuels. In this regard:

- The Government intends to **rationalise energy subsidies** by developing a targeted subsidy mechanism based on needs.
- The Ministry of Economy aims to launch the **Natural Gas Roadmap** to, among others, enhance competitiveness of upstream oil and gas and plan and execute cost-effective build-out of gas infrastructure.

- Human Capital and Just Transition

The NETR recognises that the growth of capacity and competencies is crucial in augmenting the energy sector's workforce. The following are the key initiatives planned by the Government to address diminishing job opportunities in carbon intensive sectors and the increase in demand for skilled workers in the energy transition industry:

- establish green skills taxonomy and ensure strategic workforce planning;
- develop and roll out targeted greens killing programmes;
- develop and implement community support programmes; and
- enhance energy literacy and energy efficiency awareness among students, SMEs and consumers.

- Technology and Infrastructure

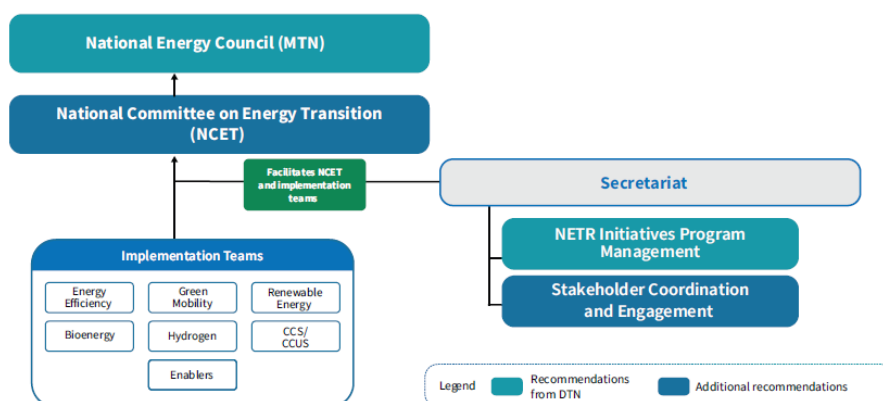
The NETR proposes the following key initiatives to facilities conditions to foster innovation and to create technological advantages across the energy sector:

- accelerate development of domestic industries for green manufacturing and adoption of green technologies; and
- develop a National Energy Knowledge Hub for public access.

- Governance and Implementation

To coordinate and facilitate the planning and implementation of energy transition initiatives, responsibilities and regulations, the Government proposes to establish a **National Committee on Energy Transition** (spearheaded by the Minister of Economy) to monitor the implementation of NETR projects.

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Source: NETR

Conclusion

Part 2 of the NETR clearly expounds on Malaysia's energy transition ambitions and has identified the ingredients necessary to achieve those goals. What is now needed is for theory to be put into practice, and the Government should urge the relevant agencies to accelerate the formulation of clear and concrete policies and regulations which have been identified as key initiatives in the NETR.

No doubt the NETR is vital in setting the guideposts for a successful energy transition and in tapping on the economic potential that the transition brings. However, rubber must hit the road sooner rather than later and the authorities must accelerate the proper implementation of the levers and enablers mentioned in the NETR. Not only will this ensure that the energy transition is an equitable one, but will also go a long way in positioning Malaysia as one of the preferred destinations in the ASEAN region for investments by major players in the global energy transition industry.

Should you require further information on the NETR or any other matter pertaining to projects, energy and infrastructure, please feel free to reach out to our team at your convenience, through the **Christopher & Lee Ong** partners listed here.

Authors



Chor Jack
Partner

T +603 2267 2729
F +603 2273 8310
jack.chor@christopherleeong.com



Lim Siaw Wan
Partner

T +603 2273 1919
M +601 7312 2517
siawwan.lim@christopherleeong.com

Our Regional Contacts

R&T SOK & HENG | *Cambodia*

R&T Sok & Heng Law Office

T +855 23 963 112 / 113

F +855 23 963 116

kh.rajahtannasia.com

RAJAH & TANN | *Myanmar*

Rajah & Tann Myanmar Company Limited

T +95 1 9345 343 / +95 1 9345 346

F +95 1 9345 348

mm.rajahtannasia.com

RAJAH & TANN 立杰上海

SHANGHAI REPRESENTATIVE OFFICE | *China*

Rajah & Tann Singapore LLP

Shanghai Representative Office

T +86 21 6120 8818

F +86 21 6120 8820

cn.rajahtannasia.com

GATMAYTAN YAP PATACSIL

GUTIERREZ & PROTACIO (C&G LAW) | *Philippines*

Gatmaytan Yap Patacsil Gutierrez & Protacio (C&G Law)

T +632 8894 0377 to 79 / +632 8894 4931 to 32

F +632 8552 1977 to 78

www.cagatlaw.com

ASSEGAF HAMZAH & PARTNERS | *Indonesia*

Assegaf Hamzah & Partners

Jakarta Office

T +62 21 2555 7800

F +62 21 2555 7899

Surabaya Office

T +62 31 5116 4550

F +62 31 5116 4560

www.ahp.co.id

RAJAH & TANN | *Singapore*

Rajah & Tann Singapore LLP

T +65 6535 3600

sg.rajahtannasia.com

RAJAH & TANN | *Thailand*

R&T Asia (Thailand) Limited

T +66 2 656 1991

F +66 2 656 0833

th.rajahtannasia.com

RAJAH & TANN | *Lao PDR*

Rajah & Tann (Laos) Co., Ltd.

T +856 21 454 239

F +856 21 285 261

la.rajahtannasia.com

RAJAH & TANN LCT LAWYERS | *Vietnam*

Rajah & Tann LCT Lawyers

Ho Chi Minh City Office

T +84 28 3821 2382 / +84 28 3821 2673

F +84 28 3520 8206

CHRISTOPHER & LEE ONG | *Malaysia*

Christopher & Lee Ong

T +60 3 2273 1919

F +60 3 2273 8310

www.christopherleeong.com

Hanoi Office

T +84 24 3267 6127

F +84 24 3267 6128

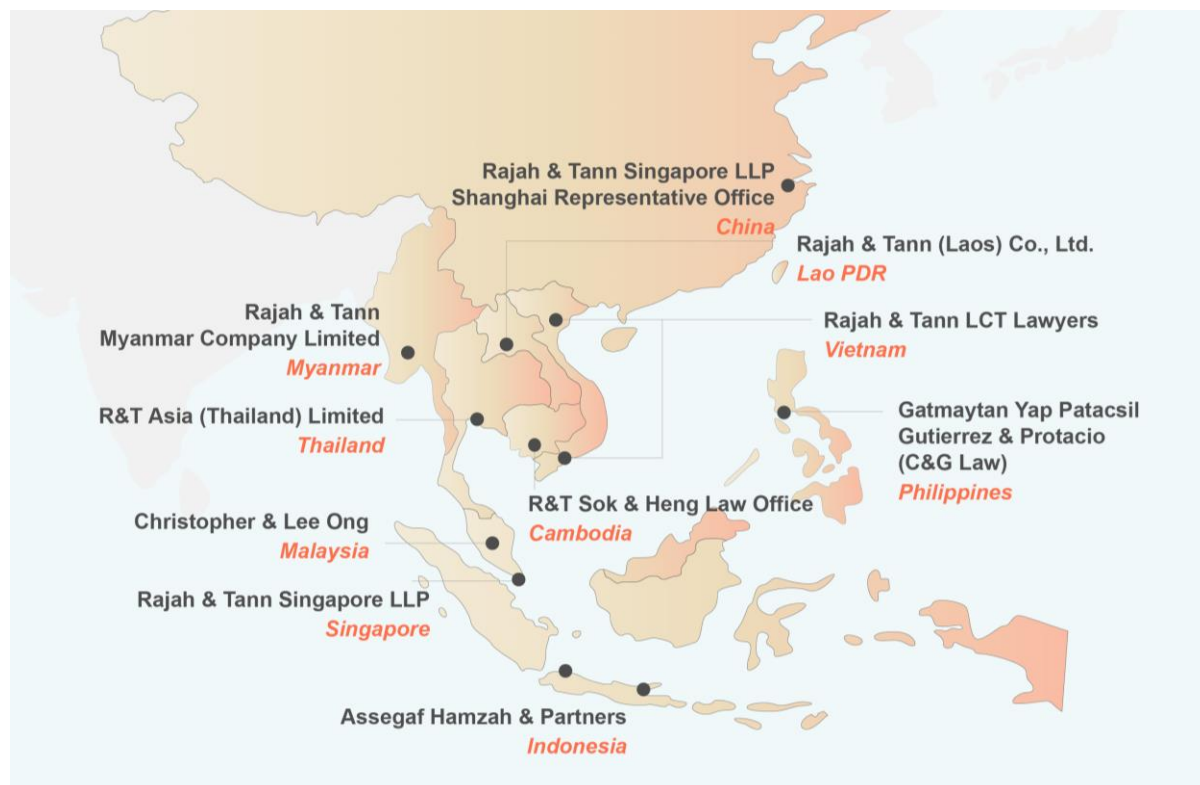
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