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MALAYSIA**

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Chamber of Commerce And Industry)

*Creating Value for the  
European-Malaysian Business Community.*

## **Chief Sustainability Officer (CSO) Roundtable Dialogue – Sustainability in Manufacturing**

**12<sup>th</sup> September 2023  
11 am**

**Bolstering alliances for a prosperous EU – Malaysia partnership**

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# AGENDA

**01**

## **Welcoming Address by:**

- **Pearl Lai, Board of Director of the Danish Chamber of Commerce (DANCHAM)**
- **Introduction by Sven Schneider, CEO of EUROCHAM Malaysia**

**02**

## **Dialogue Session on three topics:**

- (1) **'Renewable Energy'** to be moderated by **Sven Schneider, CEO of EUROCHAM.**
- (2) **'Circularity in Manufacturing'** to be moderated by **Pearl Lai, Board of Director of DANCHAM.**
- (3) **'Hydrogen Economy'** to be moderated by **Dr. Jenny J. Westin, Director at The Malaysian-Swedish Business Association (MASBA), and Mr Mohd Amir Shariff, Chief Marketing Officer (BCN Smart Technologies)**

**03**

## **Lunch**

**\*Brewery Tour will be made available on request basis**



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# Discussion on Sustainability in Manufacturing Topics

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# EU Green Deal Directives

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At the crossroads of environmental urgency and global responsibility, the European Union's Green Deal stands as a landmark initiative that charts a path towards a more sustainable and resilient future

As the EU strategically positions itself to lead the charge in combating climate change and enhancing ecological well-being, nations around the world are similarly compelled to align their efforts with these ambitious goals

With a concerted focus on sustainable practices, Malaysia is committed to aligning its policies and actions with the principles of the EU Green Deal, aiming to catalyze a shift towards ecological harmony while simultaneously fostering socio-economic growth and inclusivity



# Carbon Border Adjustment Mechanism (CBAM)



## What is CBAM?

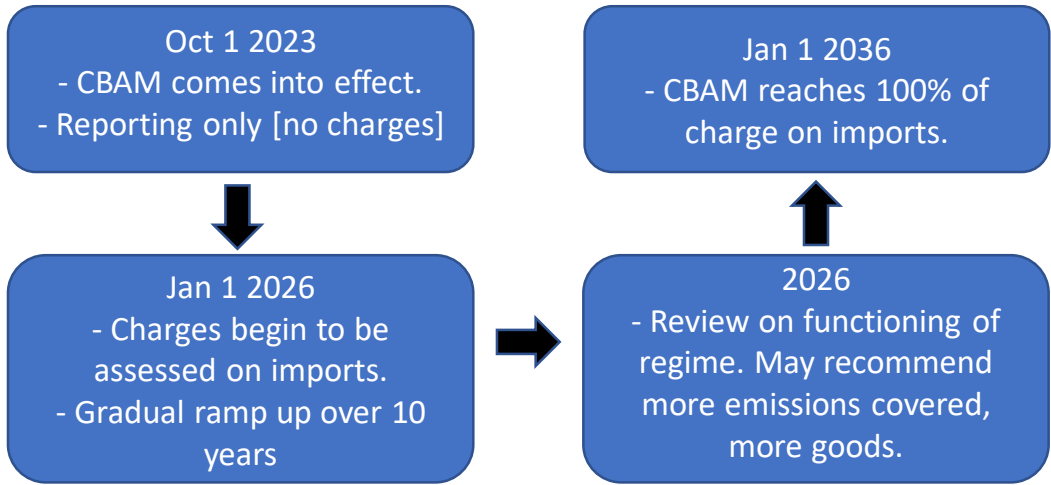
The Carbon Border Adjustment Mechanism (CBAM) is an EU system that aims to tackle carbon leakage and promote eco-friendly production. It follows international obligations, including those of the WTO. EU importers will purchase carbon certificates based on the EU's carbon pricing rules. Non-EU producers can deduct the cost if they prove they already paid for carbon in a third country. The goal is to encourage non-EU producers to adopt greener practices.

## Coverage:

CBAM is designed to encompass imports of specific goods within the European Union, including iron & steel, aluminum, cement, nitrate fertilizers, hydrogen, and electricity.

This coverage extends to essential upstream materials, semi-processed goods, and a limited number of manufactured items, such as steel screws, nuts, and bolts.

## Timeline of Phases



## Reporting Obligations:

### Transitional Phase – Oct 2023 to Dec 2025

- ✓ Total quantity of goods imported during the preceding quarter.
- ✓ Total embedded direct and indirect emissions in those goods
- ✓ The carbon price due in the country of origin for the embedded emissions

### Post Transitional Phase – Jan 2026 onwards

- ✓ Total quantity of goods imported during the preceding calendar year.
- ✓ Emissions to be verified by EU accredited verifier
- ✓ Total number of CBAM certificates to be surrendered



# EU Deforestation Regulation (EUDR)



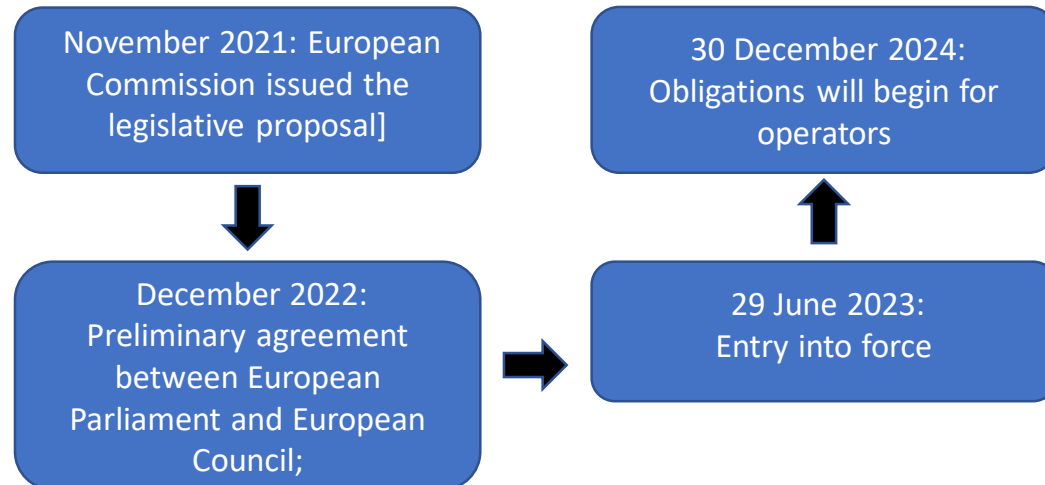
## What is the EUDR?

**Initial Scope (Before September 2022):** The European Union Deforestation Regulation (EUDR) initially covered six commodities that represented the largest share of EU-driven deforestation: palm oil (33.95%), soy (32.83%), wood (8.62%), cocoa (7.54%), coffee (7.01%), and cattle (5.01%).

**September 2022:** The European Parliament suggested expanding the regulation to include meat from swine, poultry, sheep, and goats, as well as rubber, maize, paper, and charcoal. In December 2022, the EU Commission, Council, and Parliament had a discussion and agreed to include rubber in the regulation.

**June 2023:** The European Union Deforestation Regulation (EUDR) came into force, initiating a transition period lasting 18 to 24 months.

## Timeline of Phases



## Coverage:

Palm oil, Soy, Timber, Cattle, Cocoa, Rubber, Coffee, Derivative products (e.g., leather, chocolate, furniture).

## EUDR Benchmarking System:

Three-tier system to assign risk to countries according to risk of deforestation (Low / Standards / High) based on rate of deforestation and forest degradation, rate of expansion of land for agricultural commodities, production trends, national laws and laws enforcement, etc. All countries start off as "standard risk", the benchmarking system need to be defined within 18 months upon entry into force.

## EUDR under Due Diligence:

### Due Diligence Obligations:

- ✓ Applicable to all operators and traders who place commodities and products on the EU market

### Due Diligence Process:

Collect information on:

- ✓ Legality compliance
- ✓ Deforestation-free (via geo-location data)
- ✓ Risk assessment of potential non-compliance
- ✓ Risk mitigation

Submit a due diligence statement / declaration to EU Competent Authorities;



# EU Forced Labour Product Ban



## What is the EU Forced Labour Product Ban?

The European Commission has proposed a comprehensive ban on products made with forced labour in the EU market, covering both domestic production and imports. This policy addresses the global issue of modern-day slavery, which affects millions of individuals worldwide. The policy emphasizes the principles of risk-based assessment and proportionality, with tailored measures that consider the size, resources and labour scale of companies such as SMEs before initiating formal investigations.

## Timeline of Phases

In July 2021, the EU gave guidance to help its businesses combat forced labor.

In February 2022, the EU shared its plan to promote decent work globally and proposed rules for larger companies to ensure they respect human rights and the environment.

The EU also actively worked with international organizations to address labor violations. This all led to a shift from voluntary to mandatory rules for businesses on sustainability and human rights..

## Process:

- ✓ National authorities in Member States enforce the prohibition of forced labor with a robust, risk-based approach. They assess forced labor risks using various sources, like civil society input, a database, and company due diligence.
- ✓ Investigations start when there are strong suspicions of forced labor in certain products. Companies must provide information, and inspections can happen even outside the EU. If forced labor is found, products are withdrawn and banned, and companies must dispose of the goods. Customs authorities enforce this at EU borders. However, If evidence is lacking, authorities can make decisions based on available facts.
- ✓ The process follows risk assessment and proportionality principles, considering small and medium-sized companies (SMEs). SMEs get specific treatment based on their size, resources, and the risk scale before formal investigations. Support tools are also available for SMEs.
- ✓ The Commission will issue guidelines within 18 months, including forced labor due diligence guidance and risk indicators.
- ✓ The EU Forced Labor Product Network will facilitate cooperation between authorities and the Commission.





# Corporate Sustainability Due Diligence Directive



## What is the Corporate Sustainability Due Diligence Directive (CSDDD)?

The EU's Corporate Sustainability Due Diligence Directive promotes responsible and sustainable corporate practices through mandatory rules. Its aims include greater accountability and transparency in business, empowering consumers, and benefiting companies with improved risk management, innovation, access to finance, and a better reputation.

## Application of Rules:

The new due diligence rules will apply to the following companies and sectors:

EU Companies:

- Group 1** all EU limited liability companies of substantial size and economic power (with 500+ employees and EUR 150 million+ in net turnover worldwide).
- Group 1** EU companies with more than 250 employees and a net worldwide turnover of more than EUR 40 million, provided at least 50% of this turnover was generated in a high-impact sector.
- Group 1** non-EU companies that generate a net turnover of more than EUR 150 million in the EU in the last financial year.
- Group 1** non-EU companies that generate a net turnover of more than EUR 40 million in the EU, provided at least 50% of worldwide turnover was generated in a high-impact sector.

## Enforcement:

The proposed directive would be enforced at the country level, with two key enforcement mechanisms:

1. **Directors' Responsibility:** EU company directors would need to oversee due diligence and consider human rights, climate change, and environmental impacts in their decisions. This is similar to the UK's Senior Managers and Certification Regime (SM&CR) and would make directors more accountable for their company's actions.
2. **Civil Liability:** Companies could be held responsible for damages if they don't meet their obligations to prevent, stop, or lessen potential harm. This could lead to sustainability-related lawsuits, adding to companies' legal concerns.

## Current State:

The European Parliament is expected to vote on its formal position later in 2023, then legislative negotiations can begin. Based on recent votes by the Parliament's Economic and Monetary Affairs Committee (ECON) and Environment Committee (ENVI),

Likely that MEPs will vote to expand, rather than narrow, the scope of the CSDDD. There may also be moves to add financial services as a "high-impact" sector.



# Corporate Sustainability Reporting Directive



## Scope:

### What is the Corporate Sustainability Reporting Directive?

The Corporate Sustainability Reporting Directive (CSRD) is a new EU law that requires large companies and listed companies to disclose information on social and environmental risks, opportunities, and their impact on people and the environment

Main Aim: To support the evaluation of sustainability performance as part of the European Green Deal

The CSRD modernizes and strengthens reporting rules, expanding the scope to approximately 50,000 companies

Overall requirements:

- Inclusion in the Annual Report
- External (limited) assurance (as from FY2024)
- Reporting principles
- Format and timing

Topic-specific disclosures:

- Environmental (incl. EU Taxonomy)
- Social
- Governance
- Sector-specific standards

General Disclosures:

- Business model, strategy and policies
- KPIs and targets (forward looking information)
- Company and sustainability governance
- Double materiality assessment and due diligence
- Risk and opportunity management

### Which companies will it be applicable?

All (listed or non-listed) large companies (two of three criteria met):

- 250 employees and/or
- €40M Turnover and/or
- €20M Total Assets

### When will it be applicable?

In February 2022 the Council of European Union proposed a delay in the implementation timeline:

January 2025: Large reporting entities not currently subject to the NFRD report in 2026 on 2025 data

January 2024: Reporting entities already subject to the NFRD report in 2025 on 2024 data

January 2026: Listed SMEs, small and non-complex credit institutions and captive insurance entities report in 2027 on 2026 data

# Renewable Energy in Malaysia

Presented by: Mr Sven Schneider, CEO of EUROCHAM Malaysia

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# Market Size for Renewable Energy in Malaysia

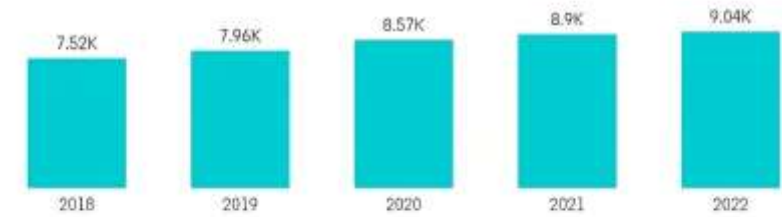


## Market Overview

- Malaysia is actively transitioning to renewable energy sources to reduce greenhouse gas emissions.
- This transition involves expanding renewable capacity from 6 to 14 GW, increasing renewables' share from 18% to 30% of the generation mix.
- The Malaysia Renewable Energy Market size is anticipated to expand from 9.68 gigawatts in 2023 to 12.04 gigawatts by 2028, registering a Compound Annual Growth Rate (CAGR) of 4.45% during the forecast period (2023-2028).
- The market faced challenges due to the spread of COVID-19, resulting in reduced investments and regional shutdowns. However, it has since rebounded to pre-pandemic levels.
- Malaysia has set ambitious targets for solar energy, with plans to install 9 gigawatts of solar energy capacity by 2050. These targets, along with innovative business models such as solar leasing, are expected to create significant opportunities in the near future.
- Malaysia's goal is to have renewables (excluding hydropower) make up 20% of the generation mix by 2025.
- In Sarawak, the government aims to achieve over 70% renewable energy in its power mix by 2030, making it one of the most ambitious states in Malaysia regarding climate initiatives.
- Historical electricity demand growth in Malaysia was approximately 2.5% per year, with a projection of 1.8% per annum from 2020 to 2030.
- To meet this demand growth, Malaysia will require approximately 10.0 GW of new capacity, including replacing retiring plants and ensuring system reliability.

## Malaysia Renewable Energy Market: Total Renewable Energy Installed Capacity

Malaysia Renewable Energy Market: Total Renewable Energy Installed Capacity, in Megawatts (MW), Malaysia, 2018-2022

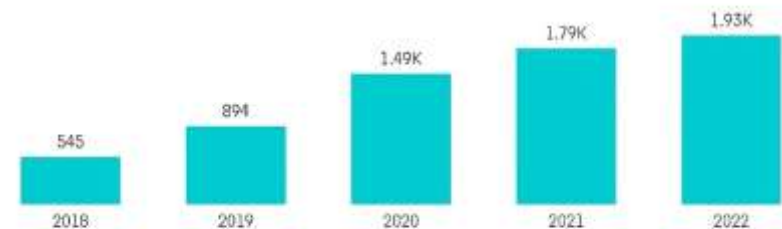


Source: International Renewable Energy Agency



## Malaysia Renewable Energy Market: Total Solar PV Installed Capacity (In Megawatts)

Malaysia Renewable Energy Market: Total Solar PV Installed Capacity, in Megawatts (MW), Malaysia, 2018-2022



Source: International Renewable Energy Agency





## Introduction:

- In 2018, the energy sector was a major contributor to Malaysia's GDP (28%) and employment (25% of the workforce).
- Petroleum-related products contributed significantly to fiscal income (31%) and energy exports made up 13% of total export value.
- The energy sector provides electricity and transport fuels to over 10 million customers, creating jobs and business opportunities.

## Energy Sources:

- Fossil fuels, including natural gas, crude oil, petroleum products, and coal, dominate Malaysia's energy supply (96.1% of TPES).
- Unlike fossil fuels, which are finite resources, renewable energy relies on naturally replenishing sources. By tapping into the power of wind, sunlight, and water, Malaysia can avoid depleting its finite fossil fuel reserves.
- Renewables like hydropower, solar, and bioenergy account for a small portion (3.9%) of total primary energy supply (TPES).



## Evolution of the Power Sector:

- Historically, Malaysia's power sector operated as a vertically integrated monopoly.
- It has gradually transitioned to a privatized system to attract investment, enhance efficiency, and ensure a sufficient power supply.
- Independent power producers (IPPs) have played a key role in improving electricity reliability and addressing capacity shortages.

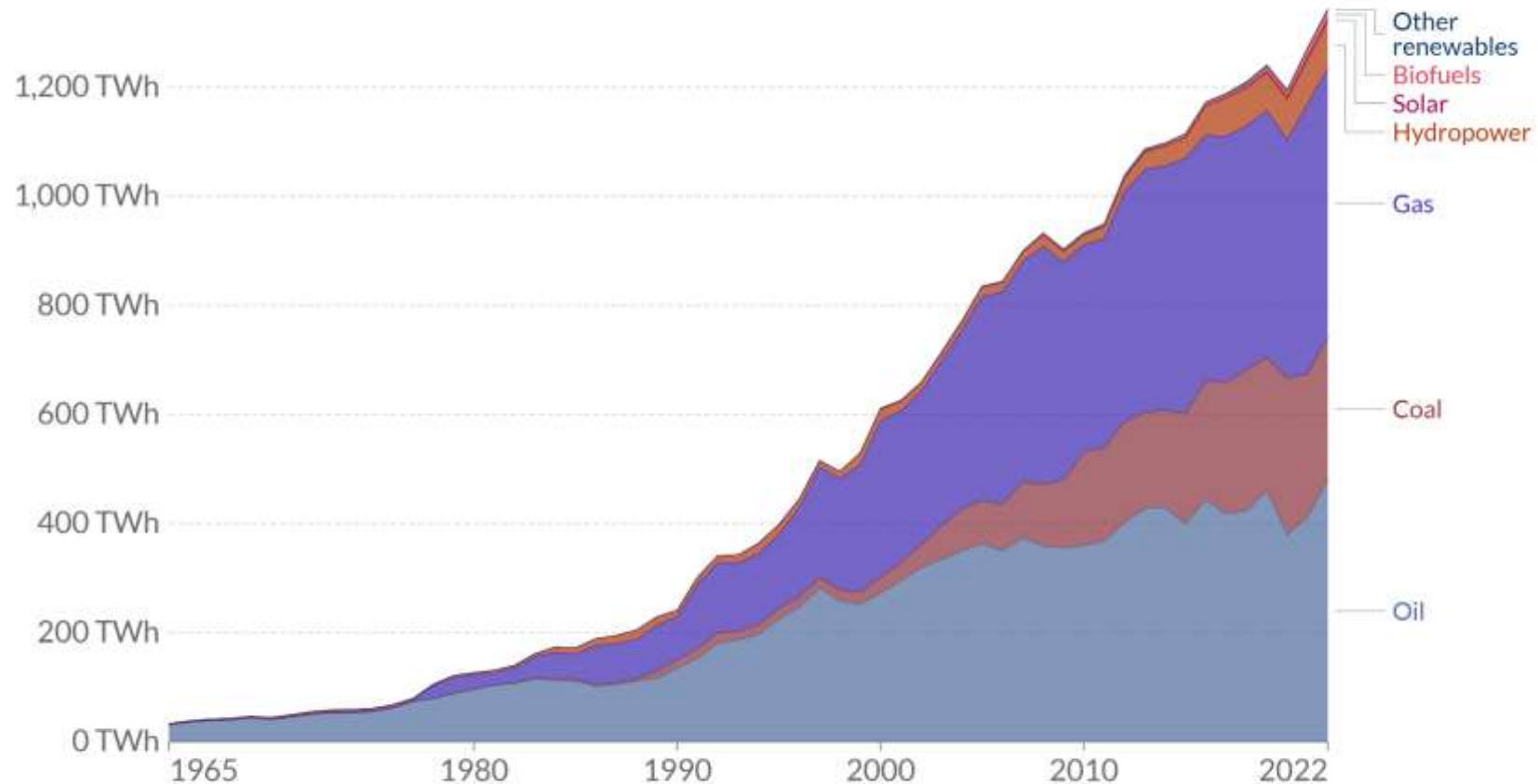
## Role of Natural Gas:

- Natural gas serves as a transitional fuel in Malaysia's energy transition.
- Third-party access (TPA) was introduced in 2017 to promote competition among industry players, including IPPs, and ensure a reliable gas supply at competitive prices.



## Energy consumption by source, Malaysia

Primary energy consumption is measured in terawatt-hours (TWh). Here an inefficiency factor (the 'substitution' method) has been applied for fossil fuels, meaning the shares by each energy source give a better approximation of final energy consumption.



Source: Energy Institute Statistical Review of World Energy (2023)  
Note: 'Other renewables' includes geothermal, biomass and waste energy.



# Areas of Opportunity in Renewable Energy

## Municipal Solid Waste

- Urbanization and population growth in Malaysia result in more solid waste.
- Bioenergy can be produced from this waste using Waste-to-Energy (WTE) technologies.
- WTE offers dual benefits: effective waste management and increased energy supply.

## Biomass/ Biogas

- Abundant biomass resources in Malaysia: timber, oil palm waste, rice husks, and municipal waste.
- Palm oil processing waste supports bioenergy: biomass combustion, biogas capture.

## Wind

- While Malaysia generally has low wind speeds, certain locations in Peninsular Malaysia and northern Sabah show favorable wind conditions for wind turbine installation.
- Ongoing advancements in low wind speed technology may improve the economic feasibility of wind power generation in the future.

## Mini Hydro

- Malaysia has favorable hydrogeological conditions for small hydropower generation.
- Numerous river basins and an estimated 2.5 GW resource potential can support small hydropower development, contributing to emissions reduction and energy security.

## Geothermal

- Studies have identified geothermal resource potential in Tawau, Sabah, and Ulu Slim, Perak, with a total potential capacity of 229 MW.
- Geothermal sources offer long-term renewable energy prospects in Malaysia.

## Solar Photovoltaic (PV)

- Equatorial position yields ample sunlight for workable solar PV energy.
- Malaysia boasts notable solar PV potential: ground, rooftop, and floating options.
- Solar PV investments fuel complete industry growth, encompassing equipment manufacturing and installation.





## Renewable Energy Agenda

Solar technologies enable sunlight to be converted into electrical energy through solar photovoltaic (PV) panels.

## Net Energy Metering (NEM) Program

NEM program allows excess PV-generated energy to be exported back to the grid.

Categories:

- NEM Rakyat (domestic users)
- NEM GoMEn (government buildings)
- NEM NOVA (industrial/agricultural)

Approved capacity under NEM: 84.5130 MW (Rakyat), 32.6740 MW (GoMEn), 535.0091 MW (NOVA) by SEDA Malaysia.

## Government's Emphasis on RE

- Government efforts to promote widespread adoption of renewable energy (RE), with a focus on solar.
- Electricity tariff not raised for nearly 99% of domestic users due to Imbalance Cost Pass-Through ICPT mechanism.

## Solar Energy Potential

- Solar energy highlighted as the most promising RE source.
- Malaysia's abundant daily sunlight (over four hours) supports year-round solar power generation.
- Potential to reduce electricity bills for consumers who generate their own electricity.

## Current solar capacity:

Malaysia presently has 2,165 MW of installed solar capacity, as reported by Apricum, a consulting firm based in Berlin.

## Solar Panel System Overview:

Maximum capacity for NEM domestic consumers: Up to 72 kWp (three phases).

Components: Inverter, mounting structure, optional battery storage.

Connection to TNB grid: Direct feed or feed-in-tariff.

Self-consumption scheme with bi-directional meter to track import/export.

Costs related to PV meter covered by consumers.

## Consumer Challenges

- Despite its potential, affordability remains a hurdle in the adoption of solar energy in Malaysia.
- Average installation cost for homeowners: RM18,000 to RM50,000, with a payback period of 4 to 6 years.
- Larger investments for businesses offer long-term financial benefits, tax reductions, and environmental contributions.
- Green Investment Tax Allowance (GITA) offers tax reductions of up to 48% of investment cost for businesses.



# Malaysia's Approach to Renewable Energy



Capitalising on high-value green economy

The Twelfth Malaysia Plan 2021-2025 which outlines aspirations for the nation to achieve net zero emissions by 2050

NETR is also crucial in navigating the complexity of energy transition on a large scale, especially the shift from a traditional fossil fuel-based economy to a high-value green economy.

On 27 July 2023, the Malaysian government launched the National Energy Transition Roadmap (NETR) Phase 1 to accelerate Malaysia's energy transition. NETR is critical in supporting:

The National Energy Policy (DEN) launched in September 2022 with aspirations to become a low carbon nation in 2040



On 27 July 2023, Malaysia's Minister of Economy (MOF) launched the first part of the country's National Energy Transition Roadmap ('NETR 1'). The NETR 1 is underpinned by four principles, namely:

- Aligning the energy sector with the country's aspirations and commitments to sustainable development;
- Ensuring the transition is just, inclusive and cost-effective;
- The need for effective governance and a whole-of-the-nation approach; and
- Creating high-value employment for people and generating high-impact economic opportunities for small and medium enterprises ("SMEs").

The NETR 1 identifies **six energy transition levers** to facilitate Malaysia's transition to clean energy and outlines the Malaysian Government's proposed catalyst projects under each lever.

These projects take into account key considerations such as reduction of carbon emissions, the generation of investment and creation of job opportunities, cost effectiveness, and accessibility to clean energy sources.



# Malaysia's Approach to Renewable Energy



Energy Transition Lever	Flagship	Catalyst Projects	Champion
1. Energy Efficiency	Efficient Switch	<ul style="list-style-type: none"> <li>Regulation of energy-intensive users, buildings and products under the proposed Energy Efficiency and Conservation Act.</li> </ul>	<ul style="list-style-type: none"> <li>NRECC</li> </ul>
		<ul style="list-style-type: none"> <li>Energy audit exercise by railway operators to identify current consumption baseline and identify potential energy savings.</li> </ul>	<ul style="list-style-type: none"> <li>MOT</li> </ul>
2. Renewable Energy ('RE')	Renewable Energy Zone (RE Zone)	<ul style="list-style-type: none"> <li>Development by UEM Group Berhad and ITRAMAS Corporation of pilot RE zone comprising an industrial park, residential development and data centre, integrated with one gigawatt solar photovoltaic power plant (the largest solar photovoltaic power plant in Southeast Asia).</li> </ul>	<ul style="list-style-type: none"> <li>Khazanah Nasional Berhad</li> </ul>
		<ul style="list-style-type: none"> <li>Development by Tenaga Nasional Berhad ('TNB') (in partnership with SMEs, cooperatives and state economic development corporations) of large scale solar power parks across five sites in several states, with 100MW deployment per site.</li> <li>Development by TNB of 2,500MW hybrid hydro-floating solar projects at TNB's hydro dam reservoirs.</li> </ul>	<ul style="list-style-type: none"> <li>TNB</li> </ul>
		<ul style="list-style-type: none"> <li>Construction by Sime Darby Property of 4.5MW solar capacity across 450 homes in City of Elmina and Bandar Bukit Raja, with up to 10kW solar capacity per house and offtake by commercial and industrial users within the township.</li> </ul>	<ul style="list-style-type: none"> <li>Sime Darby Berhad</li> </ul>
	Energy Storage	<ul style="list-style-type: none"> <li>Development of utility-scale energy storage systems.</li> </ul>	<ul style="list-style-type: none"> <li>NRECC Energy Commission</li> </ul>
	Energy Secure	<ul style="list-style-type: none"> <li>Initiative for securing long-term energy supply for state of Sabah through development of large-scale solar and small hydropower plants, formulation of biowaste policy and regulatory framework, and geothermal power generation.</li> </ul>	<ul style="list-style-type: none"> <li>Energy Commission of Sabah</li> </ul>



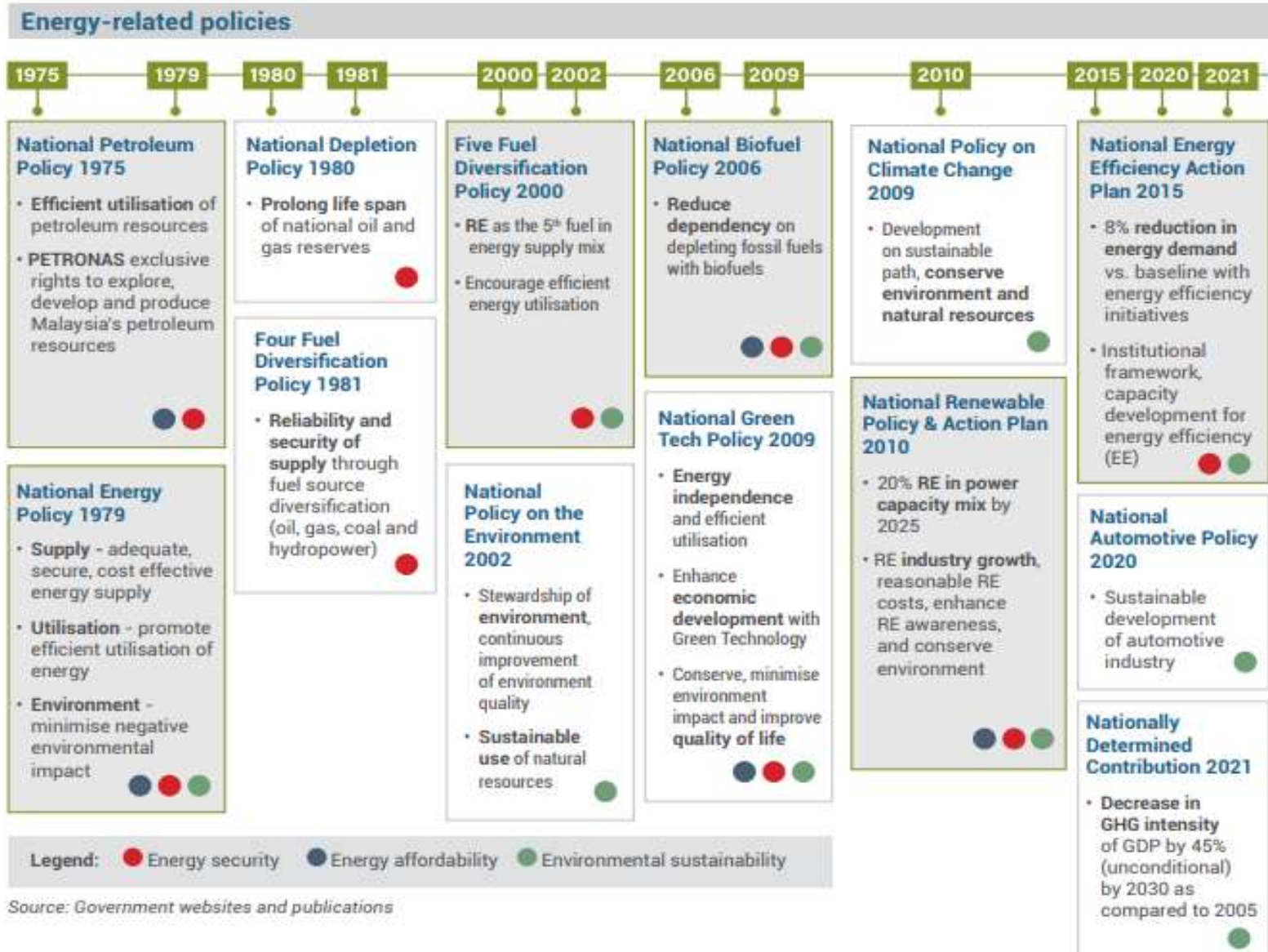
# Malaysia's Approach to Renewable Energy



Energy Transition Level	Flagship	Catalyst Projects	Champion
3. Hydrogen	Green Hydrogen	<ul style="list-style-type: none"> <li>Implementation of three integrated projects for production of green hydrogen – one in Kuching by 2025 for domestic use, and two in Bintulu by 2027 for export purposes.</li> </ul>	<ul style="list-style-type: none"> <li>SEDC Energy</li> </ul>
	Hydrogen for Power	<ul style="list-style-type: none"> <li>Collaboration between Petroliaam Nasional Berhad (PETRONAS) and TNB for co-firing of hydrogen and ammonia for decarbonisation of TNB generation plants.</li> </ul>	<ul style="list-style-type: none"> <li>TNB</li> </ul>
4. Bioenergy	Biomass Demand Creation	<ul style="list-style-type: none"> <li>Development of potential biomass clusters with a centralised plant to secure larger and more reliable feedstock.</li> </ul>	<ul style="list-style-type: none"> <li>KPK</li> <li>NRECC</li> <li>SEDA</li> </ul>
		<ul style="list-style-type: none"> <li>Co-firing of biomass with coal at the 2,100MW Tanjung Bin Power Plant by Malakoff Corporation Berhad, with a view to scale up to a minimum of 15% biomass firing capacity by 2027.</li> </ul>	<ul style="list-style-type: none"> <li>KPK</li> <li>Malakof</li> </ul>
5. Green Mobility	Future Mobility	<ul style="list-style-type: none"> <li>Installation of 10,000 electric vehicle charging stations by 2025 at highways and selected commercial buildings in collaboration with strategic partners such as TNB, Plus Malaysia Berhad, Permodalan Nasional Berhad, and Sunway Group,</li> </ul>	<ul style="list-style-type: none"> <li>MITI</li> </ul>
		<ul style="list-style-type: none"> <li>Introduction of mobile hydrogen refuelling stations in Peninsular Malaysia.</li> </ul>	<ul style="list-style-type: none"> <li>MOSTI</li> </ul>
		<ul style="list-style-type: none"> <li>Electrification of first and last mile public transport, including upgrading bus depot infrastructure for charging.</li> </ul>	<ul style="list-style-type: none"> <li>MOT</li> <li>Prasarana</li> </ul>
	Future Fuel	<ul style="list-style-type: none"> <li>Development of a bio-refinery in Pengerang, Johor for the production of bio-based products including sustainable aviation fuel and hydrotreated vegetable oil.</li> </ul>	<ul style="list-style-type: none"> <li>PETRONAS</li> </ul>
6. Carbon Capture, Utilisation & Storage	CCS for Industry	<ul style="list-style-type: none"> <li>Development of policy and regulatory framework for CCUS projects.</li> </ul>	<ul style="list-style-type: none"> <li>MOF</li> </ul>
		<ul style="list-style-type: none"> <li>Implementation of catalyst projects for Kasawari and Lang Lebah high-carbon dioxide gas fields.</li> </ul>	<ul style="list-style-type: none"> <li>PETRONAS</li> </ul>



# Malaysia's Approach to Renewable Energy





**Malaysian Green Technology and Climate Change Corporation (MGTC)** was formerly known as Malaysian Green Technology Corporation or GreenTech Malaysia. MGTC is the government agency under the purview of Ministry of Environment mandated to lead the nation in the areas of Green Growth, Climate Change Mitigation and Climate Resilience and Adaptation. Under Green Growth, MGTC focuses on three key areas:

**Green Incentives and Certification**

- Green Incentives
- Green Financing
- Green Labelling and Certification

**Green Promotion and Investment**

- Green Investment
- Business Matching
- Green Business Promotion and Exhibition

Under its recently expanded scope, MGTC now focuses on Climate Change Mitigation and Climate Change Adaption through the following roles:

**•Policy Analysis**

**•National Reporting**

**•National Programmes Coordination**

- Climate Change Mitigation
- Climate Change Adaptation

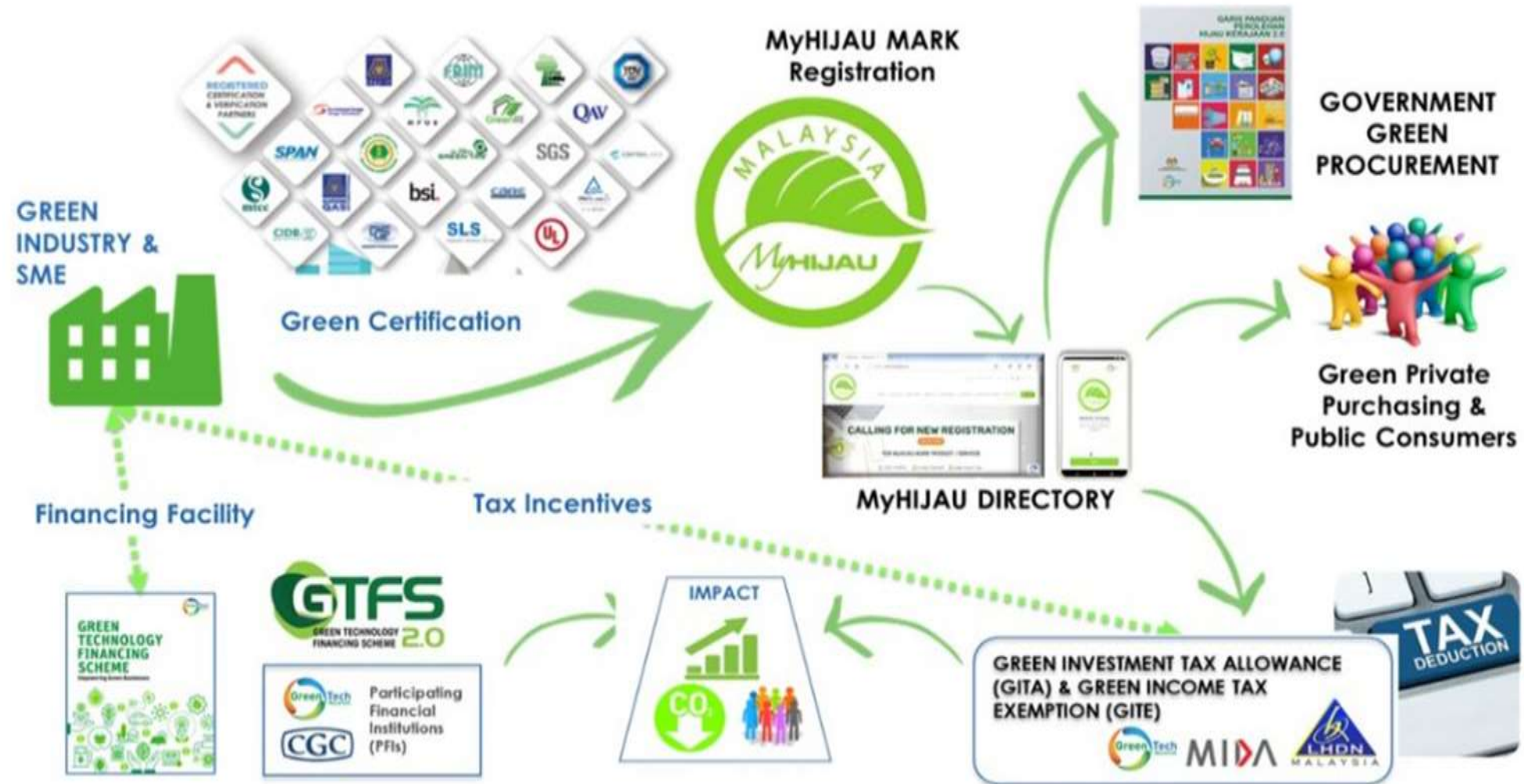
**•Focal Point for Climate Change Mitigation and Adaption Data**

**•Communication, Education and Public Awareness (CEPA)**

The National focal point under United Nations Framework Convention on Climate Change (UNFCCC) is the Climate Change Policy Division of Ministry of Environment.



# Malaysia's Approach to Renewable Energy







# Challenges for Renewable Energy in Malaysia



## Coal Dominance and Hard-to-Decarbonize Industries

- Coal is preferred due to cost-effectiveness compared to alternatives.
- 20% of Malaysia's economy relies on hard-to-decarbonize sectors like iron and steel.
- Other than coal, as an oil producer, Malaysia continues to rely on fossil fuels for energy and its economic activity, with the government recently affirming its commitment to using gas as a transition fuel.

## Impact on ESG Compliance

- Energy transition increases demand for ESG compliance in investments and business.
- Crucial for the economy, especially for SMEs, as access to financing depends on measuring and reporting carbon emissions.

## Whole-of-Nation Approach

- Effective energy transition management requires cooperation:
  - Federal government, State governments, Industry, General public and International community
- Balancing the energy trilemma: security, affordability, and environmental sustainability.

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# Efforts to increase renewable energy capacity in Malaysia's Electric Supply



## Investment Requirements:

- Efforts to boost renewable energy in Malaysia will need investments of approximately MYR 637 billion (€130.5 billion) by 2050.
- This funding will support renewable energy generation sources and improve grid infrastructure, including enhancing transmission lines, integrating energy storage systems, and covering operation costs.

## Cost Examination:

- The Ministry of Natural Resources and Environment will scrutinize the cost and investment details, as well as their impact on electricity tariffs for consumers.

## Current Solar Capacity:

- Malaysia presently has 2,165 MW of installed solar capacity, as reported by Apricum, a consulting firm based in Berlin.



# Efforts to increase renewable energy capacity in Malaysia's Electric Supply

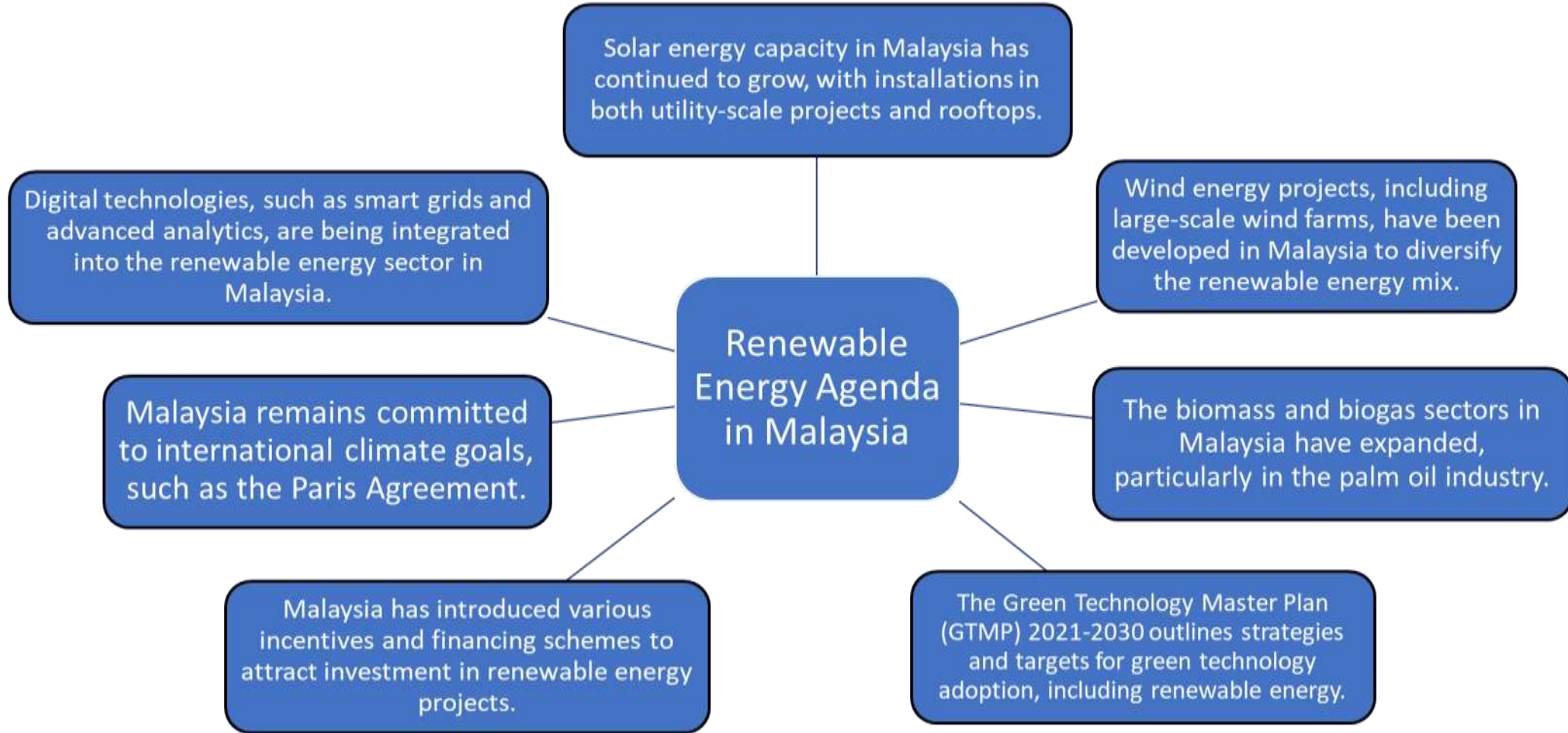


## Future Solar Goals:

- Malaysia aims to increase its solar capacity by 1,098 MW by 2025.
- A further expansion of 2,414 MW is planned by 2035.

## Renewable Energy Targets:

- The country has set renewable energy targets:
  - 31% by 2025, equivalent to 8.53 GW of total renewable generation capacity.
  - 40% by 2035, or 10.94 GW, reflecting a commitment to cleaner energy sources.



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**EUROCHAM  
MALAYSIA**

(Formerly known as EU-Malaysia  
Chamber of Commerce And Industry)

# Circularity in Manufacturing

**Presented by: Pearl Lai, Board Member of  
Danish Chamber of Commerce (DanCham)**

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# Circularity is NOT just about Recycling



...but also

- ✓ redesign
- ✓ rethink,
- ✓ remanufacture,
- ✓ refurbish,
- ✓ repurpose,
- ✓ refurbish,
- ✓ repair,
- ✓ re-use,
- ✓ reduce; and
- ✓ refuse

By circulating the products, we can secure future raw materials (keeping them in the loop) with minimal dependence on virgin materials, which have fluctuating prices.

# Circularity in Manufacturing Malaysia

## Options

PEOPLE WATCHES STYLE CULTURE FOOD MACHINES HAVEN

### R+B is Malaysia's first circular beauty brand that reuses byproducts to minimise waste in landfills

For its first range, the label incorporates Arabica coffee as the star ingredient in all its products.

PEOPLE | By Aiswarya Anil | 3 May 2023 - 9:29pm



Coffee, packed with useful vitamins and minerals, is a great source of electrolytes and hydration (All photos: R+B)

Business partners Irene Lim and Soo Hoo Siew Kheng were colleagues in an oil and gas company, specialising in marketing and communications. Naturally, they were exposed to many methods and practices for living a sustainable life and wanted to bring their knowledge into the beauty industry, which contributes a devastating amount of waste to the environment.

Sunday  
10 Sep 2023

**THE EDGE**  
MALAYSIA

Home Corporate Economy Court & Politics Sections EdgeTV Tech Opinion

### Circular Economy: Cutting out aluminium from beverage cartons

Tan Zhu Yun / The Edge Malaysia

24 Aug 2023, 12:00 am



Li: Being recyclable versus actually recycling [the packaging] are different concepts. It comes with [the availability] of infrastructure, education, consumer awareness and collection of the packaging. (Photo by SIG Group)

This article first appeared in The Edge Malaysia Weekly on August 21, 2023 - August 27, 2023

Thirteen years ago, Switzerland-based packaging company SIG Group introduced beverage cartons that did not have a layer of aluminium, which is a world first, according to the company. But it was a challenge to ensure these had the same shelf life as conventional cartons, which comprise layers of paper, polymers and aluminium.

# Commitment to transitioning towards a Circular Economy through various National Policies



Sustainable consumption and production blueprint 2016



Cleanliness Policy 2020 – 2030.



Plastics Sustainability Policy 2021 – 2030.

### NATIONAL CLEANLINESS POLICY

To begin in the year 2020 until 2030

A government initiative to make Malaysia a clean country & create a community that cultivates cleanliness habits

**FOCUSES ON 5 CLUSTERS:**

- AWARENESS OF CLEANLINESS
- SUSTAINABILITY OF THE ENVIRONMENT
- CIRCULAR ECONOMY
- GOOD GOVERNANCE & ENFORCEMENT
- SKILLED HUMAN CAPITAL

**TARGETS FOR 2030:**

- Bringing about mindset & habitual changes in all aspects of hygiene and cleanliness involving oneself, family, community & the environment
- Raising the country's cleanliness standards
- Minimising environmental pollution
- Reducing landfill waste & increasing recycling activities
- Reducing vector-borne diseases
- Improving the quality and skills of waste collection workers
- Active participation of the community, NGOs & private sector in the programmes & initiatives carried out
- Strengthening governance in solid waste and public cleansing management
- Reducing government funding of solid waste & public cleansing management

Source: Ministry of Housing & Local Government

### ROADMAP TOWARDS ZERO SINGLE-USE PLASTICS 2018-2030

*Towards a Sustainable Future*

Key milestones and targets:

- 2018: Roadmap Towards Zero Single-Use Plastics launched; Institutional framework set up; Communication, Education and Public Awareness (CEPA) Plan; Technical guidelines; Revised ECOM; Rapid response plan issued; Regional cooperation through ASEAN.
- 2020: Minimized uptake of fast bag substitutes to replace plastic bag; Rapid response plan issued; Revised ECOM; Rapid response plan issued; Regional cooperation through ASEAN.
- 2022: Rapid response plan issued; Revised ECOM; Regional cooperation through ASEAN.
- 2024: Rapid response plan issued; Revised ECOM; Regional cooperation through ASEAN.
- 2026: Rapid response plan issued; Revised ECOM; Regional cooperation through ASEAN.
- 2028: Rapid response plan issued; Revised ECOM; Regional cooperation through ASEAN.
- 2030: Rapid response plan issued; Revised ECOM; Regional cooperation through ASEAN.

Source: Ministry of Housing & Local Government



Solid waste management department 2016



# NCEC launched to mobilise efforts for Clean, Green & Resilient Development as outlined under 12<sup>th</sup> Msia Plan



NEW STRAITS TIMES

NEWS BUSINESS LIFE & TIMES SPORTS WORLD NST PODCAST NST TV VOU  
NST VIRAL CRIME & COURTS NATION GOVERNMENT / PUBLIC POLICY POLITICS



## National Circular Economic Council set up to handle solid waste

By Iylia Marsya Iskandar - September 7, 2023 @ 10:52am



Local Government Development (KPKT) Minister Nga Kor Ming has announced the establishment of the National Circular Economy Council (NCEC) to manage solid waste earlier today. - BERNAMA Pic

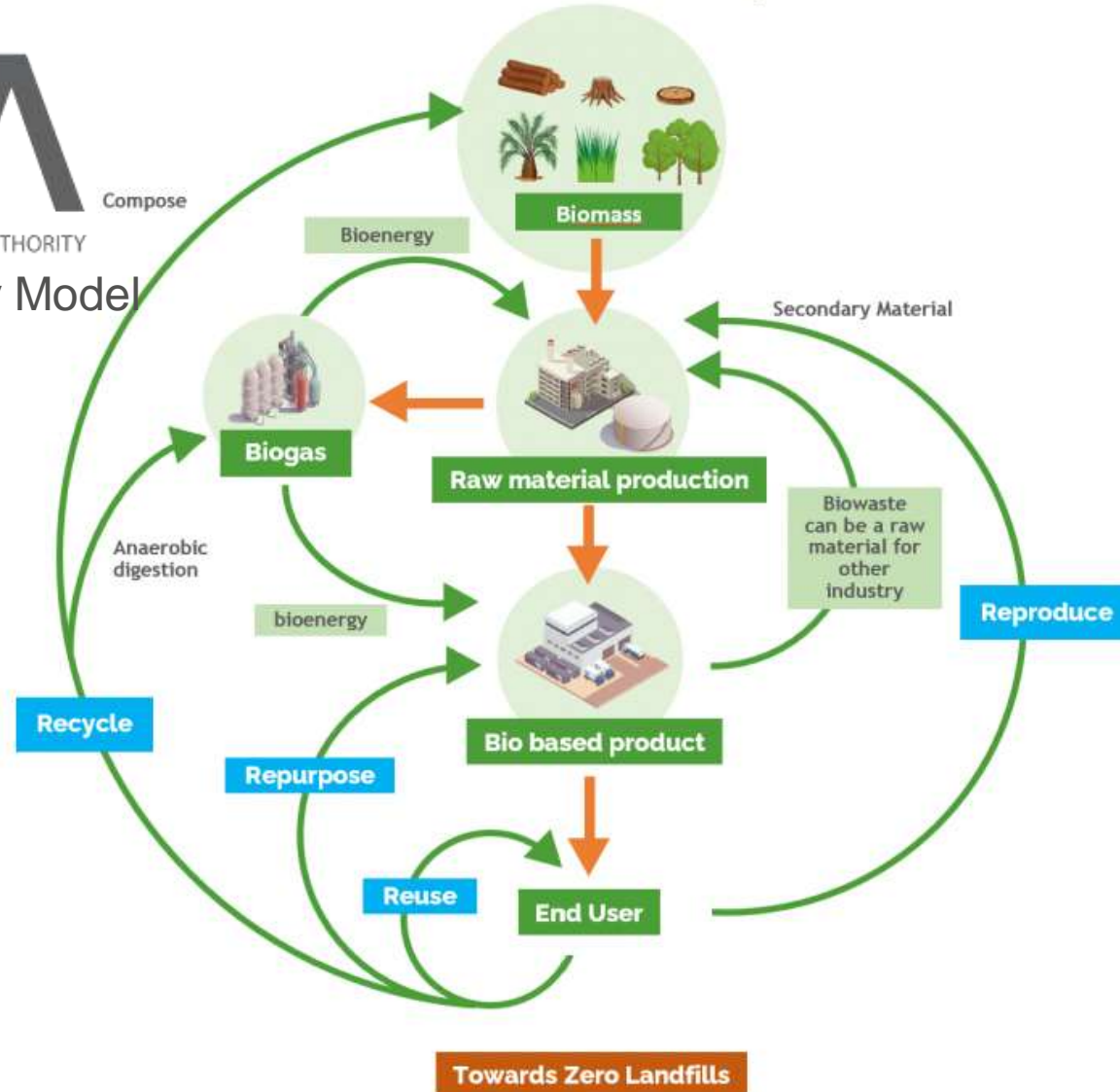
PUTRAJAYA: Local Government Development (KPKT) Minister Nga Kor Ming has launched the National Circular Economy Council (NCEC) to manage solid waste today.

Local Government Development (KPKT) is in the midst of planning a circular economy blueprint for **National Circular Economy Council (NCEC)** to act on matters relating to policies, laws, implementation of strategies and plans that required collaboration between the government and private sectors.

Focusing on six elements:

- ✓ Demand for recycled materials;
- ✓ Design optimal life cycle products;
- ✓ Promote waste segregation
- ✓ Improve collection of solid waste
- ✓ Provide facilities & incentives
- ✓ Create a public, private and community platform

# Aspiration towards Circular BioEconomy, a new catalyst of growth for Malaysia for sustainable development



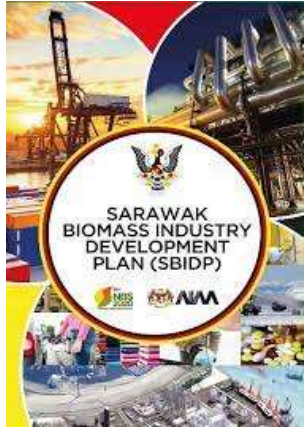
The Circular Economy in Malaysia extends well beyond the country's target for Single-Use Plastics by 2030.

It covers topics of increasing material efficiency, the utilisation of biomass and all byproducts, broader industry resource efficiency and industrial ecology approaches.

Solution to various challenges in developing circular economy is to replace non-renewable resources with renewable resources and ensure that new resources are able to regenerate sustainably – the Circular Bioeconomy.

MIDA added a new Circular Bioeconomy Unit to accelerate Malaysia's transition from a linear 'take-up' model to a circular 'make-use-return' paradigm.

# Pioneering Circular BioEconomy key for Sarawak to accelerate economic growth & be a developed state by 2030



The Sarawak State Government is vigorously exploring a new form of biobased solutions such as biofuel, biochemical, green hydrogen and algae. The goal is to gradually phase out fossil-based plastic and replace it with renewable materials that can be reproduced sustainably. This is in line with the Sarawak Green Economy Policy.



# Public-Private Partnership to leapfrog into Circular Bioeconomy



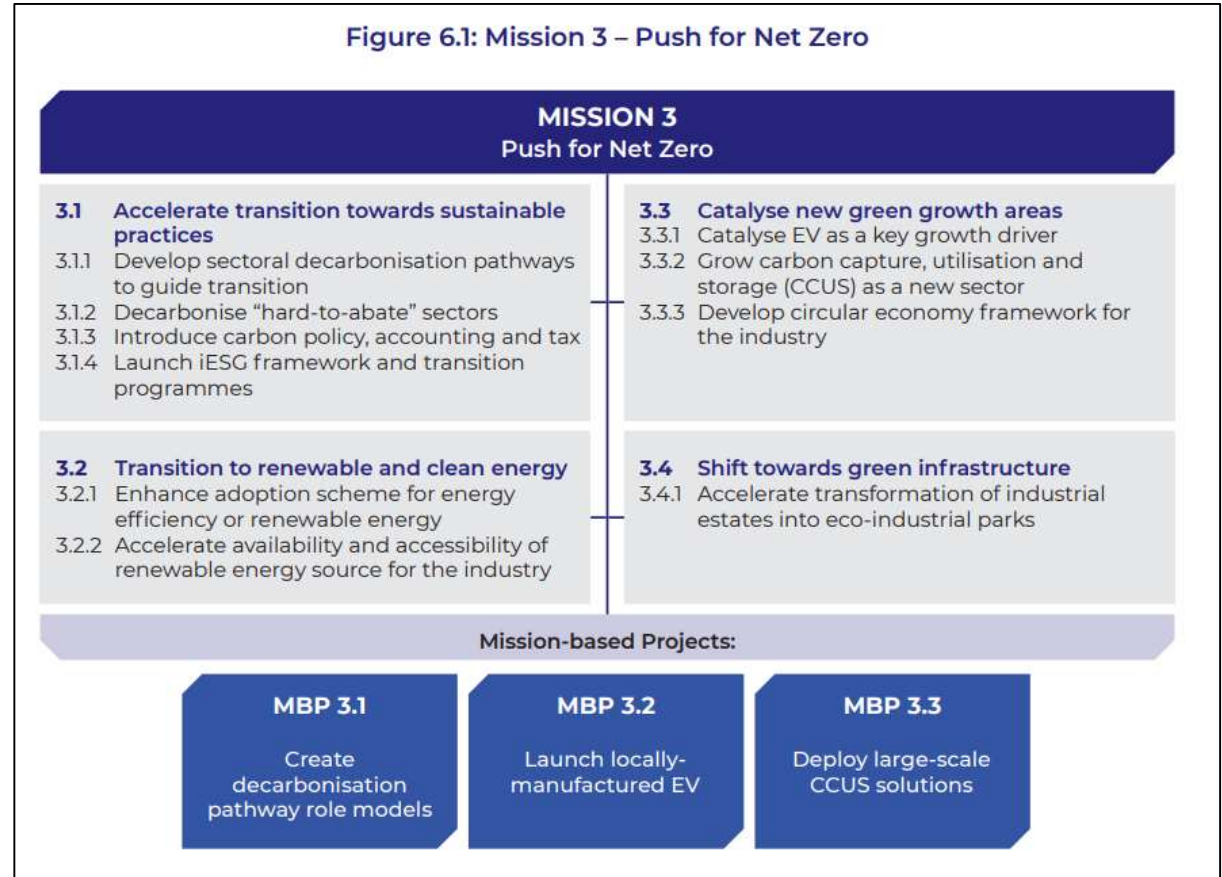
MIDA works in collaboration with a consortium of local and international partners e.g. the Port of Rotterdam, Europe's largest port, Sarawak State Government and Private Sector stakeholders, namely Sarawak Economic Development Corporation (SEDC), Bintulu Port Holdings Berhad (BPHB) and Regal Group as its founding partners.

It aims to be the best regional example of Circular BioEconomy model that covers a full spectrum of development, including a fully integrated Bioport, the industrial area, satellite centres and related soft and hard infrastructure.

# New Industrial Manufacturing Plan (NIMP) 2030 launched to enhance ESG practices in manufacturing



Figure 6.1: Mission 3 – Push for Net Zero



NIMP will increase Malaysia’s attractiveness as an investment destination through driving green manufacturing practices and transitioning towards net zero emissions. A carbon policy will be introduced, it also enable the implementation of a carbon pricing mechanism such as carbon taxes. an iESG framework is expected to be introduced to support manufacturing firms to adopt ESG practices

# Hydrogen Economy

**Presented by: Dr Jenny Jahanshahi Westin  
Executive Director - The Malaysian Swedish Business Association (MASBA), and Mr Mohd Amir Shariff, Chief  
Marketing Officer (BCN Smart Technologies)**

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## What is hydrogen and how is it produced?

- Simplest, most abundant substance in the universe: H<sub>2</sub>
  - But exists bound to other atoms (most abundant H<sub>2</sub>O)
- H<sub>2</sub> creation: breaking up hydrogen compounds
  - $2 \text{H}_2\text{O} \rightarrow 2 \text{H}_2 + \text{O}_2$  (*electrolysis*)
  - $\text{CH}_4 + 2\text{H}_2\text{O} \rightarrow 6 \text{H}_2 + \text{CO}_2$  (*reforming*)
  - This requires **ENERGY**



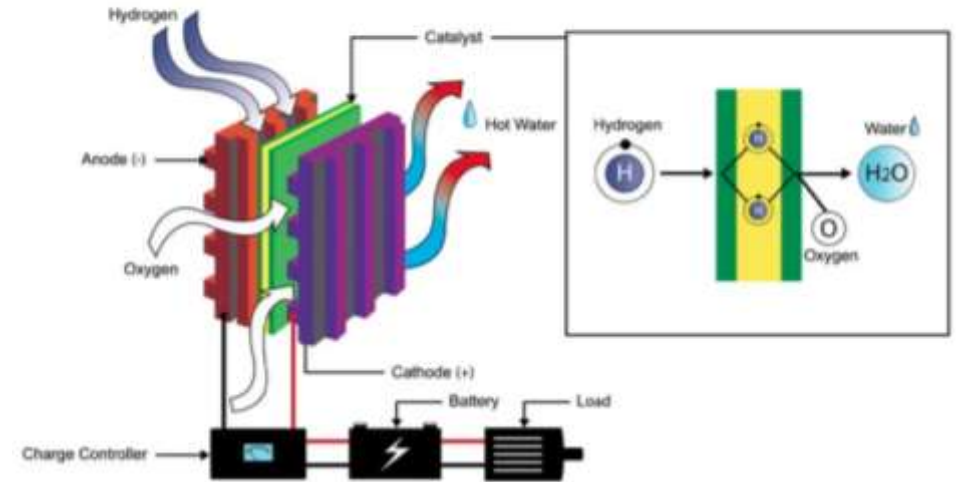
- When hydrogen burns it generates **energy** in the form of heat and water as a by-product
  - $2 \text{H}_2 \quad \quad \quad 2 \text{H}_2\text{O} + \text{ENERGY}$



## How is hydrogen used?

- Hydrogen gas drives fuel cells
  - Buses and official cars in Sarawak (Kuching) is running on hydrogen
  - To be used for large, long-haul transports (ships, aeroplanes, busses, heavy trucks) where batteries due to weight and size are not a usable option
- Direct hydrogen use requires infrastructure
  - Pipelines, gas stations etc.
  - Transport of H<sub>2</sub> gas: temperature controlled and highly pressurised

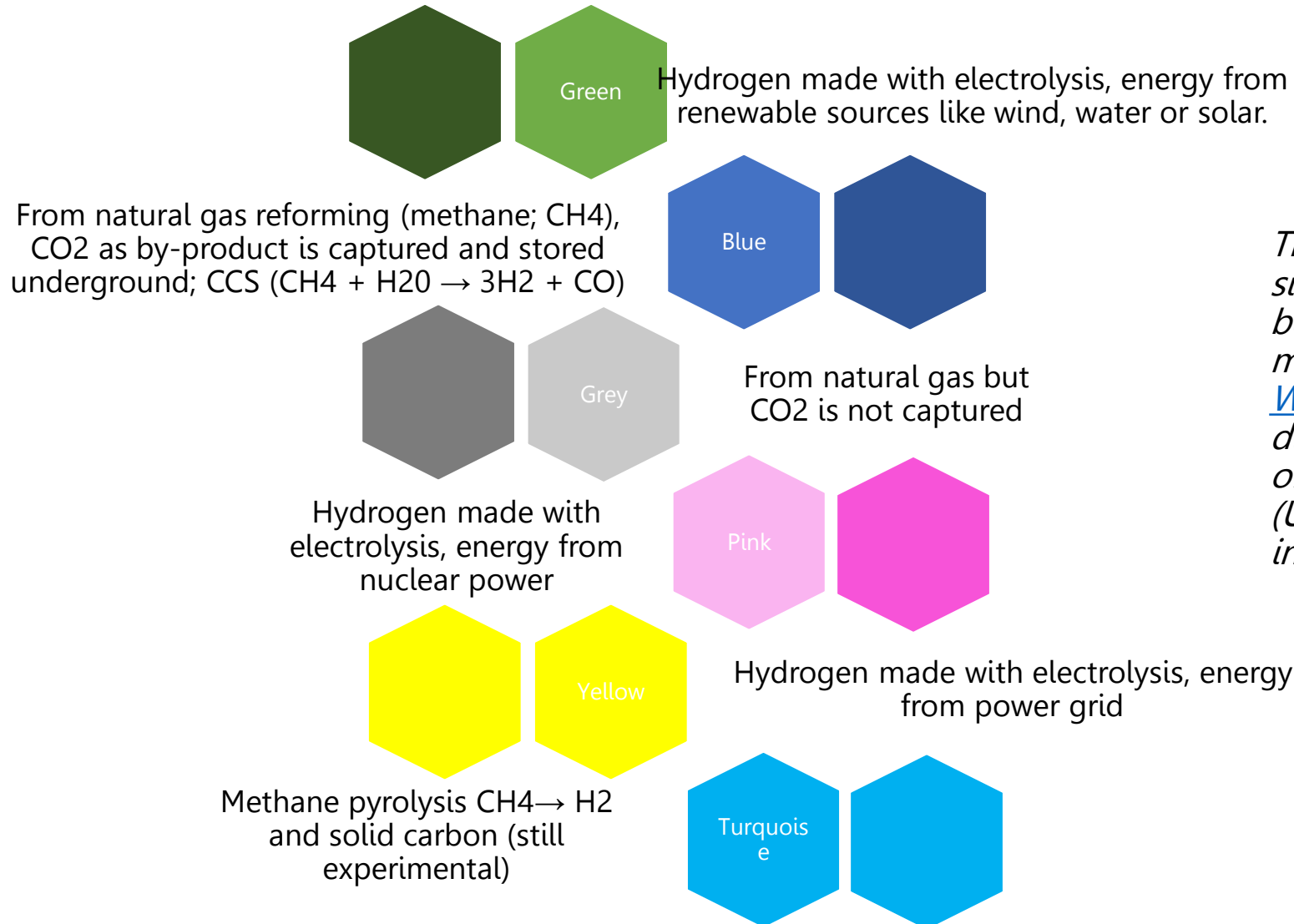
### Hydrogen Fuel Cells







# Different “types” of Hydrogen (based on how it is produced)

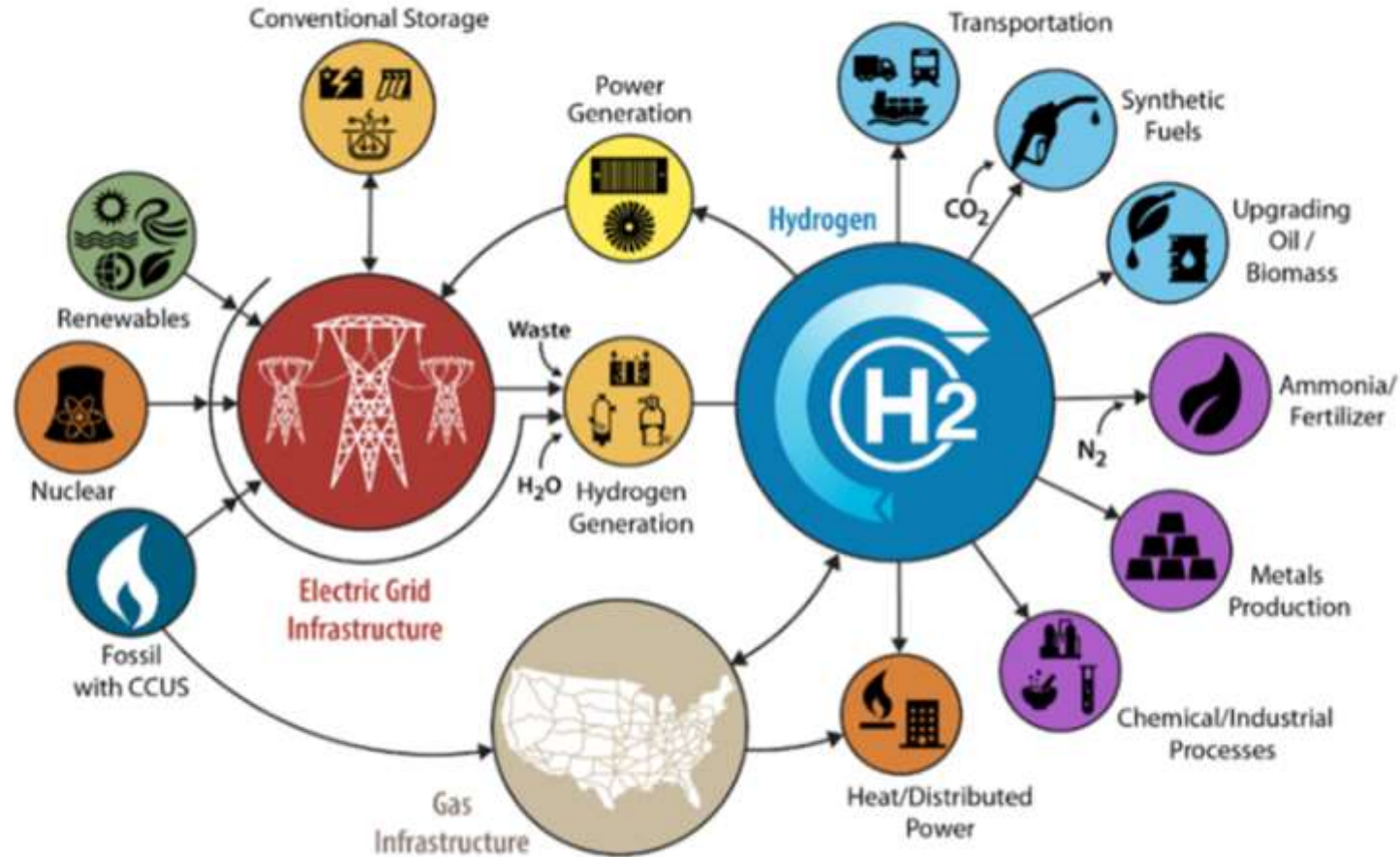


*The color system is a bit simplistic and needs to be updated and made more specific, said [Daryl Wilson](#), the executive director of the Coalition of the Hydrogen Council (US), an organization of industry CEOs.*



# Hydrogen ecosystem visualized

## Conceptual H2@scale (hydrogen at scale) energy system



Source: U.S. Department of Energy, *Hydrogen Program Plan*, Figure 3, November 2020

Note: CCUS is carbon capture, utilization, and storage.



- Process  $\text{H}_2\text{O} \rightarrow \text{H}_2 \rightarrow \text{H}_2\text{O}$  up to 85 percent energy loss
  - Solar cells that are in use only has around 25-30 percent efficiency
- GHG (greenhouse gases) leakage:
  - $\text{CO}_2$  (production and storage)
  - $\text{CH}_4$  (extraction and reforming)
  - $\text{H}_2$  (storage, transport, end use) )




GLOBAL PRODUCTION 2020: 0.4% green, 98% from  $\text{CH}_4$  or gasification of coal (of which 1% blue). Yearly production amounts to 75Mt of which 0.01MT used in fuel cell EV

BUT: If drawbacks are mitigated in a correct way, green hydrogen is 100% circular with an unlimited source



# Hydrogen in National Energy Transition Roadmap

<b>Hydrogen</b> 	<b>Green Hydrogen</b>	<b>Sarawak Hydrogen Hub</b> Implementation of three integrated projects to produce green hydrogen will propel Sarawak as a regional green hydrogen hub. These projects involve the development of a green hydrogen production plant in Kuching by 2025 for domestic use, and two plants in Bintulu by 2027, mainly for export purposes. Sarawak State Government through SEDC Energy is collaborating with strategic partners to develop the state into a green hydrogen hub.	SEDC Energy
	<b>Hydrogen for Power</b>	<b>Co-Firing of Hydrogen and Ammonia</b> Green hydrogen and ammonia co-firing in collaboration with PETRONAS to decarbonise TNB generation plants.	TNB



## Federal level:



Extensive policy framework in place to regulate electricity market (but lack of local policy direction and clarity).

## Moving forward:



Targets and Mandate: Gov. expectation on H2 long-term role



PPA and Wheeling: To ensure market demands (green H2)



Carbon tax and allocation: Needed for Blue H2 to surpass Grey in terms of economical viability



De-risking investments: for Carbon Capture and Storage; blue H2 (including long-term liability exposure)



(Additionality: energy for green H2 production not to be derived from general power grid. Possible EU legislation)



**Methanol to**  
Methanol + water



**Hydrogen**  
Gas

**M-Reformers**  
Bringing Hydrogen closer

# Why a Methanol Reformer System

1. Climatic Change → Emissions Reduction → Mandatory driver push for Zero/Low Emission Vehicles
2. Heavy Duty / High Power Systems NOT supported 100% by battery technology
3. Global Infrastructures for H<sub>2</sub> & BEV electric supply won't be ready in the short & medium term.
4. Green energy Backup Solution off Grid and support to low availability in renewable Energy (Solar and wind turbines).
5. Mobility → new purification system:  
"Output Quality H<sub>2</sub>" > 99,97%



## Main Strong points of MMM reformers

**M REFORMER**  
FORMERS





# A New way to generate H<sub>2</sub>

## Hydrogen generation using a renewable energy

**Versatile Solution:** scalable hydrogen generation and flexible run times.

**Reliable and Low Maintenance:** Simple design and construction with high reliability.

**State of the Art Controls:** Fully-automated Woodward Flex 500 control modules provide state for the arts operation and safety.

**Improved Efficiency:** More efficient operationally than diesel engines when matches with a battery bank.

**0% NO<sub>x</sub>, SO<sub>x</sub>, particulates and low CO<sub>2</sub>:** 28 % less CO<sub>2</sub> than a diesel generator

**M REFORMER** FORMERS

**Future Ready:** ready to meet all future requirements by using renewable methanol.

**Carbon Capture:** Can be configured for efficient carbon capture and thus carbon negative with renewable methanol.



# Methanol Reformer Products



## Low Power

S-Series Hydrogen Generator  
From 1 to 10 Kw



## Medium Power

L/M Series Hydrogen Generator  
From 100 – 150 – 235 Kw

## Applications

- Telecom Cellular stations.
- Security Camera
- Railroad crossings
- Broadband repeater stations
- Heavy-duty Vehicles.
- Stationary power (distributed and backup power)
- Grid-independent BEV charging stations.
- Materials handling lift trucks.
- FCEV automobile

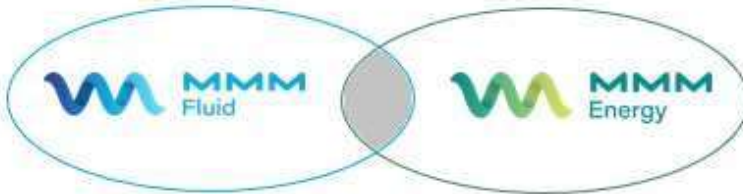
## Advantages

- Reduced Noise and Pollution.
- No harmful gas emissions.
- Low Cost of Hydrogen
- Low initial Cost of Equipment
- Displace H<sub>2</sub> compression or Cryogenics storage
- Scalable for Expanded Hydrogen Deployments
- Long Run Times
- Limited Power Requirements
- Compact Design
- Reduced and simple Maintenance
- State of Arts Controls

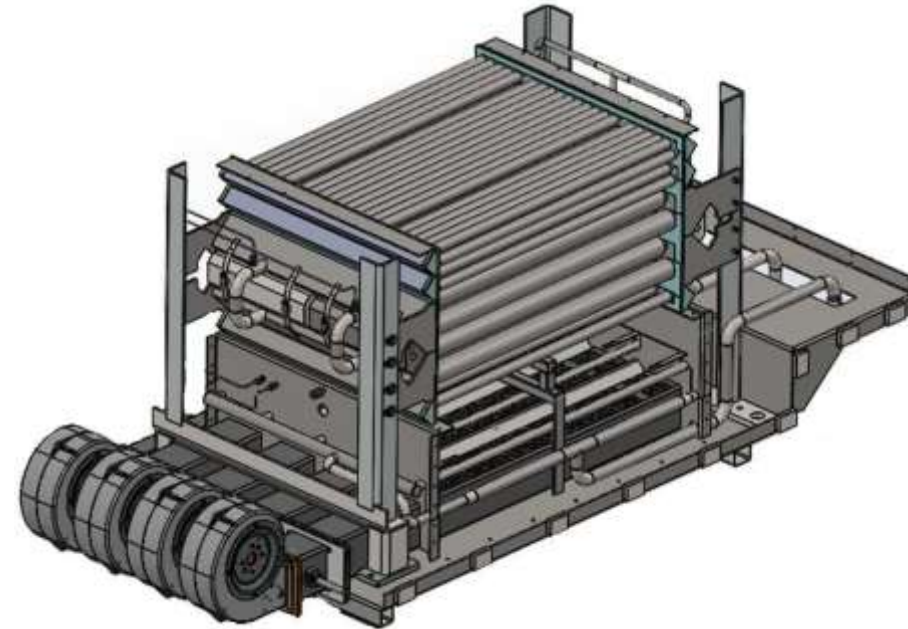
# Methanol Reformer:

## Tubing technology

**M REFORMER** RMERS

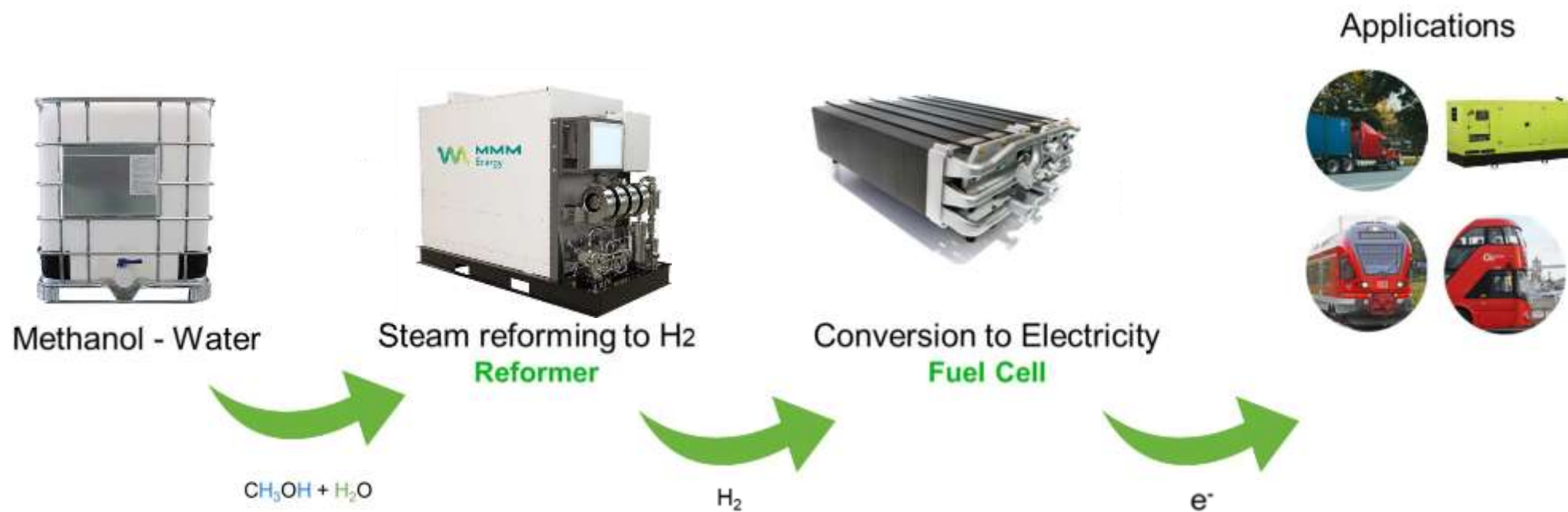


- Stainless Steel
- Safety components
- Quality mindset
- Competitive production



## Methanol to electricity across Hydrogen

**M REFORMER FORMERS**



## Solution: Small Power units (S30)

From 1 to 10kW scalable

### Back up Supply for Isolated Telecom Towers

Often located in protected natural environments where regulations ban the use of polluting generation systems and/or high noise levels, our products represent a suitable solution to comply with these regulations.



Operating only with easily transportable feedstocks (methanol and water), they offer robust, stable and low-maintenance operation and integrate perfectly with other power solutions (solar & wind).



## Solution: High Power Unit (M18/30)

Current power up to 235 Kw

### Charging Stations for Electric Vehicles (BEV)

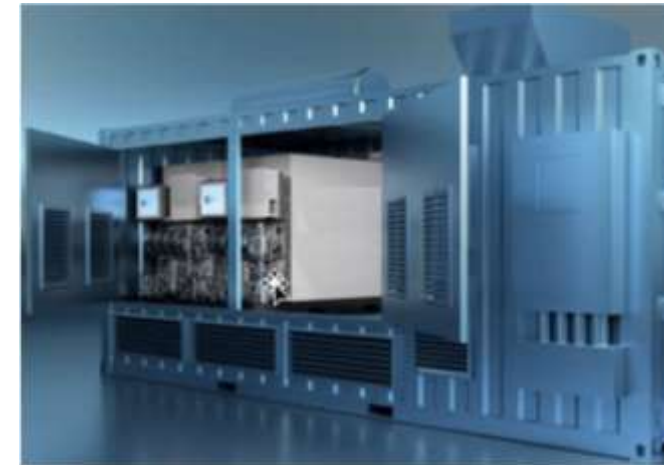
The important expansion of electric vehicles (BEVs) requires the creation of charging points in locations, near or remote, where high electrical power output may not be available. For these situations, our hydrogen generators open up the possibility of powerful, demand-driven, scalable power generation.



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**M REFORMER**  
A Company by MMM Energy **ORMERS**



### CCS: Energy Power Station (distributed and backup)

- Grid independence charging station.
- Scalable for Expanded Hydrogen Deployments
- Compact Design
- Reduced and simple Maintenance
- State of Arts Controls

## Solution: High Power Unit (M18/M30)

Current power up to 235kW.

Data Centers Backup / EDGE DATA CENTERS



- Ensure an uninterrupted data center power supply
- Meet the demand for 24/7 power with reformer solution.
- Scalable / Modularity
- Efficient & Reliable System
- Fast Installation

# Railways Applications: Retrofitting

Retrofitting of Diesel Trains.

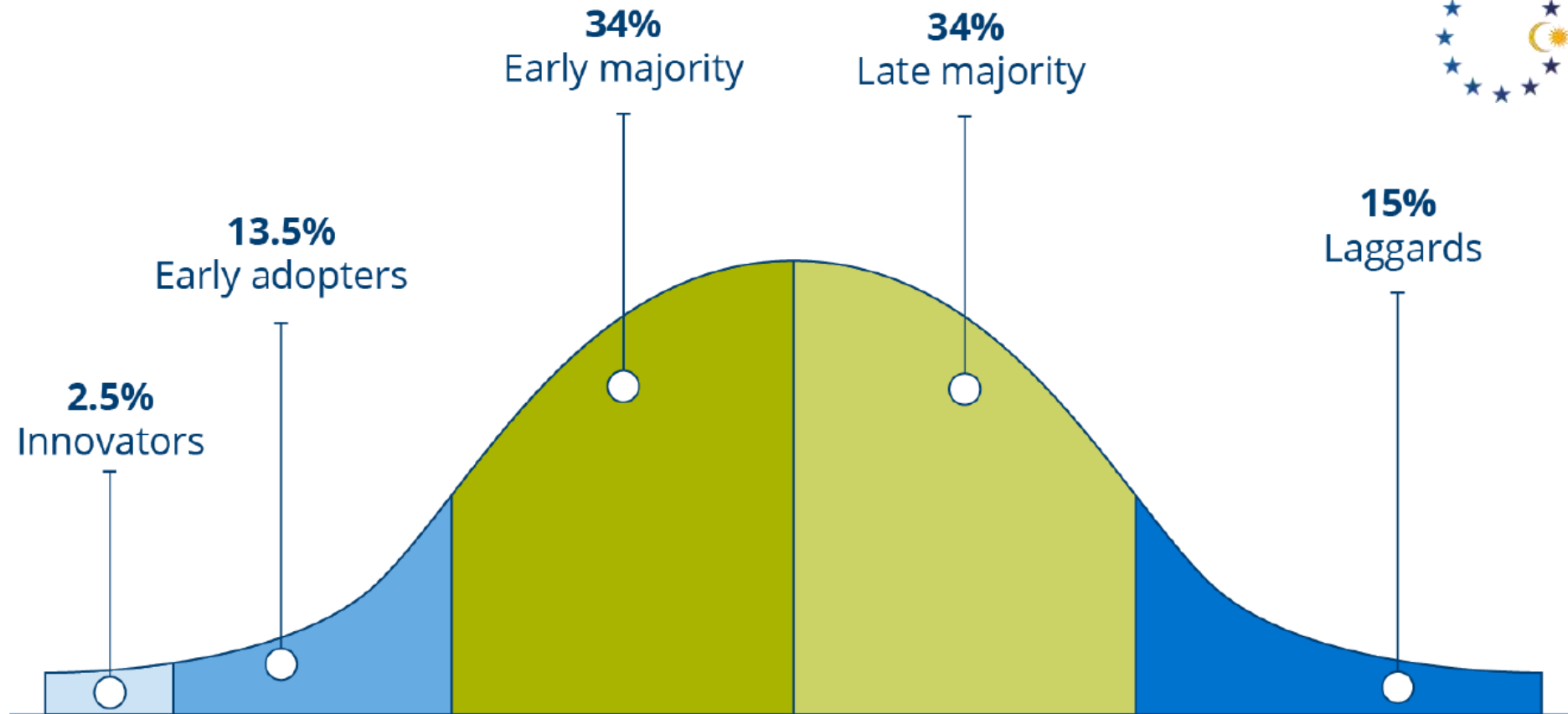
- Optimization of the Current Space.
- Low Cost of Hydrogen.
  - Methanol vs High Pressure Hydrogen
    - Grey/Blue Hydrogen saving of 9 Mio€
    - Green Hydrogen saving of 2,5 Mio€.
- Investment equal to the H2 high pressure solution
- No investment need in the current diesel refueling stations.
- 2 Units per Train of MR18 provide 350-400 kw.
- H2 Flow needs: 19,5 kg/h
- Low refueling time.
- Long Run Times 20-30 hours between refueling.
- Compact Design
- Reduced and simple Maintenance
- State or Arts Controls

Companies from different countries in Europe interested to explore this interesting technical solution: Italy, France, Czech Republic & Spain.

**M REFORMER** FORMERS







**Visionaries and enthusiasts**

Those who welcome change and accept that the benefits of using new technologies will require support in overcoming barriers and switching costs

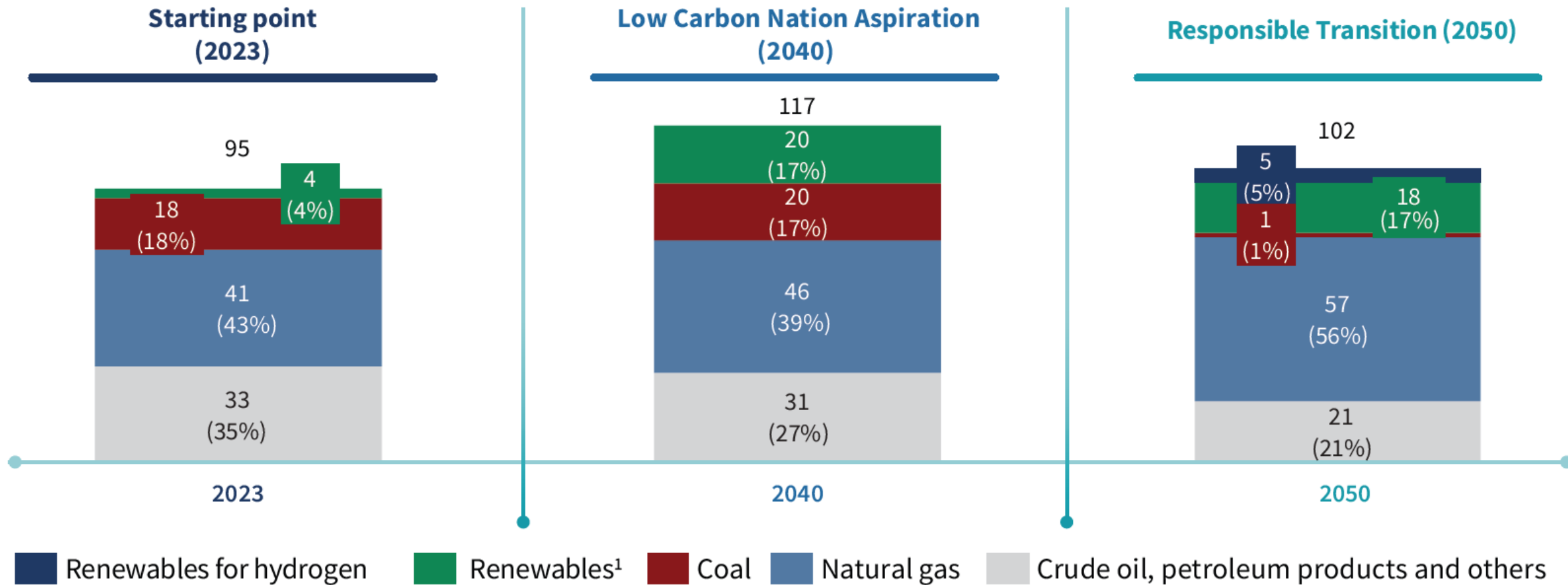
**Mainstream adopters**

**Resisters**

Those who refuse to adopt an innovative idea

# Exhibit 4.3: Malaysia's projected TPES by 2050

## Total Primary Energy Supply (Mtoe), by energy source



1. Includes bioenergy, solar, hydropower and hydrogen

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