INSTITUTE OF STRATEGIC ANALYSIS & POLICY RESEARCH

INSAP POLICY PAPER: An Energy Renaissance – is Malaysia ready?

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The context

Methane emissions from the energy sector remained near record highs in 2023[1], average global surface temperatures have been on a steady rise while the north and south poles continue to melt. These are just the tip of the iceberg when it comes to global warming, which continues to accelerate at worrying rates year after year. However, these issues are not merely environmental concerns but they also pose a significant economic threat. INSAP has found various studies that point out global warming could cost the world up to $24 trillion (£19 trillion) over the next 36 years.[2]

Given the risk at stake, addressing climate change has moved up higher in terms of global agenda in recent years, with events like the 28th Conference of the Parties (COP28) in Dubai highlighting the need for action. The transition from non-renewable to renewable energy sources has become a focal point that commands attention from major stakeholders worldwide. This heightened focus stems from the urgent need to confront both the depletion of fossil fuels and the far-reaching impacts of climate change driven by our current consumption levels

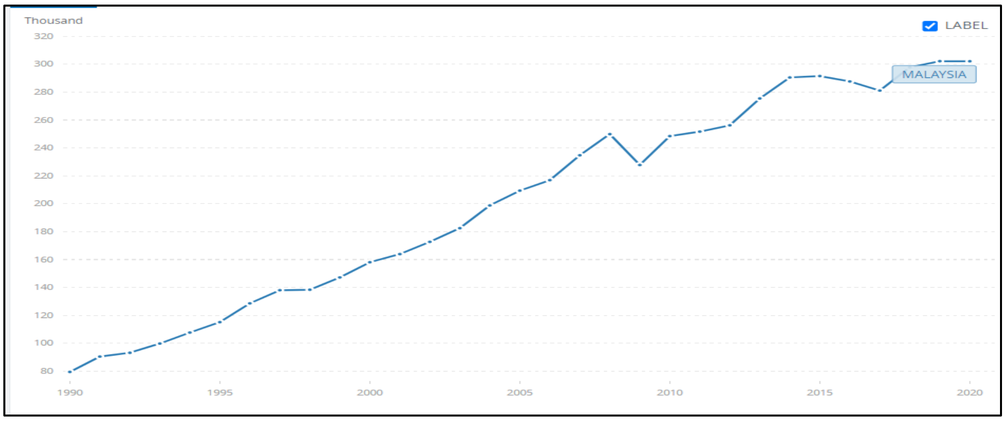
Malaysia, like many countries, also faces environmental challenges. Total greenhouse gas emissions have been steadily rising over the past few decades (Figure 1), contributing to climate change. This has been further compounded by rapid urbanization and poor authority control over the last few decades, which places additional strain on the environment. Given its complexity, this shift necessitates extensive collaboration among related industry leaders, government entities, and academia experts who must remain committed to accelerating the development and deployment of green energy technologies, while simultaneously pursuing strategies to mitigate and adapt to the effects of climate change.

Essentially, climate change is not and must not be the only reason to embrace a green economy powered by renewables. Fossil fuels are a finite resource, and their production and use are inherently inefficient with significant energy loss during conversion. Fortunately, we see a global consensus: countries are starting to recognize that renewable and clean energy offers superior efficiency, both technically and in terms of climate impacts. By 2050, projections suggest low-carbon sources will dominate the energy landscape, exceeding 90%, while fossil fuels dwindle to a mere 10% (Figure 2).

Malaysia is no different. The energy sector is a critical pillar of the Malaysian economy, contributing to approximately 28% of GDP whereby 13% of total export value are energy exports and petroleum-related products contributing 31% of fiscal income, The energy sector has also created employment opportunities, contributing to a quarter of the workforce in 2020.[3]

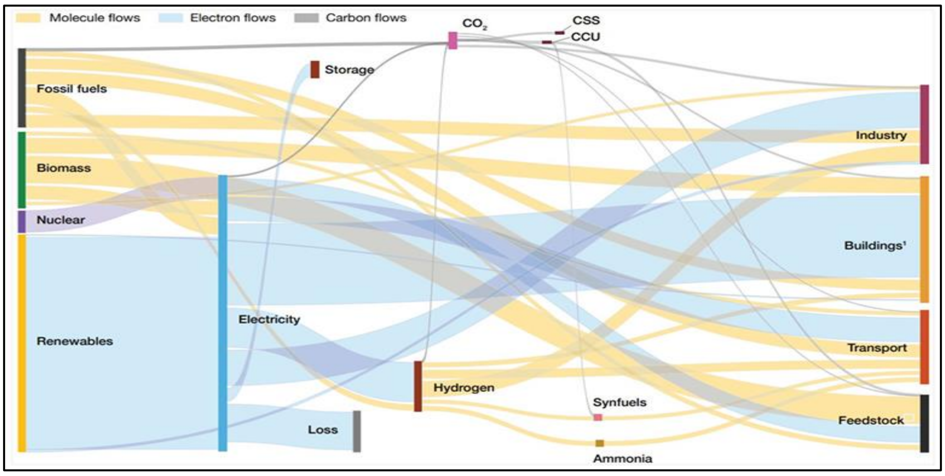
[1] https://www.iea.org/reports/global-methane-tracker-2024/key-findings
[2] https://www.dailymail.co.uk/sciencetech/article-13191505/climate-change-cost-24-TRILLION-36-years.html
[3] Ibid.

Figure 1: Total greenhouse gas emissions- Malaysia (1990-2020)



Source: The World Bank[4]

Figure 2: PwC Strategy & illustration of energy source and target (2050)



Source: PwC's Inventing Tomorrow's Energy System (2021)[5]

In terms of our energy mix, Malaysia still remains reliant on fossil fuels. INSAP has found out that four main energy sources dominated the national total primary energy supply (TPES) mix. Natural gas constituted the largest portion at 42.4%, followed by crude oil and petroleum products at 27.3% and coal at 26.4%. Natural gas, the dominant energy source in Malaysia (42.4%), offers a lower-emission alternative compared to their fossil fuel counterparts, coal and oil.[6] However, since it remains a fossil fuel, the supply is and will be limited. Furthermore, Malaysia's growing dependence on imported natural gas (specifically liquified natural gas) which has been on a fairly consistent rise since 2013, reaching a record high 3.8 billion cubic meters in 2022[7] further exacerbates the issue.

Recognizing the need for a swift transition to renewable and cleaner energy sources, the government unveiled the National Energy Transition Roadmap (NETR) in mid-2023. This roadmap sparked significant discussions within the energy sector, highlighting its importance in achieving the ambitious target of net-zero greenhouse gas emissions by 2050. The NETR outlines targeted initiatives across

[4] https://data.worldbank.org/indicator/EN.ATM.GHGT.KT.CE?contextual=default&end=2020&locations=MY&start=1990&view=chart
[5] https://www.pwc.com/my/en/assets/publications/2023/pwc-malaysia-summary-national-energy-transition-roadmap-netr-phase-1-august-2023.pdf
[6] https://education.nationalgeographic.org/resource/natural-gas/
[7] https://www.statista.com/statistics/1361082/malaysia-volume-of-lng-imports/

six key sectors: Energy Efficiency (EE), Renewable Energy (RE), Hydrogen, Bioenergy, Green Mobility, and Carbon Capture which all involve five cost cutting enablers; finance, policy, human capital, technology and governance. These initiatives aim to ultimately reduce Malaysia's dependence on carbon-intensive fuels in a sustainable way.

Critics argue that Malaysia has ample time to achieve its goals. The National Energy Transition Roadmap (NETR) sets a target of 70% renewable energy in the national energy mix by 2050, aiming for net-zero emissions in the same timeframe. While 26 years may seem like a significant amount of time and credit has to be given for a robust framework, Malaysia currently lacks a strong foundation for widespread renewable energy adoption, both for businesses and households. With fossil fuels still dominating the energy landscape at over 96%, renewables (including hydropower, solar, and bioenergy) make up a mere 3.4%. This translates to a monumental shift – transitioning over 65% of the current energy sources to renewables within the next three decades. The key question remains: is Malaysia on the right track to meet these ambitious targets?

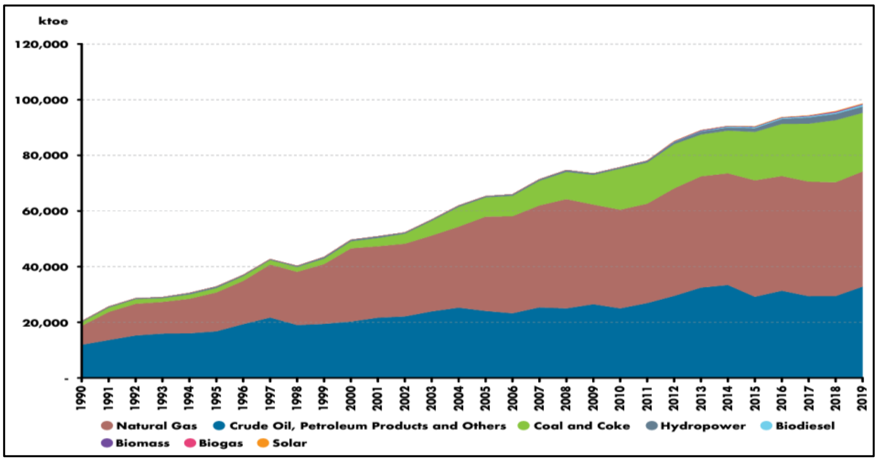
Malaysia's Energy Landscape: A brief look into the numbers and trends.

Energy Supply and Capacity.

As briefly stated earlier, Malaysia's energy mix remains heavily reliant on fossil fuels (Figure 3) with renewables contributing only around 3.5 to 4% of the total supply. When we zoom in on the energy mix of renewable energy capacity itself, we observe that large hydro (67%) still remains the main supply from the renewable source perspective while solar despite its potential still lags behind at just 18% of the renewable energy capacity mix.

MIDF projects that solar energy will experience an uptake, reaching 40% of the renewable's capacity mix by 2035, complemented by a reduced dependency on large hydro (Figure 4). However, this projection seems relatively far-fetched at the moment given the challenges associated mainly with the high sum of initial investments (into solar panels) and integrating these renewable energy sources into the grid. As for overall energy consumption, levels have decreased except for three sources that saw an increase: crude oil, natural gas, and biodiesel.

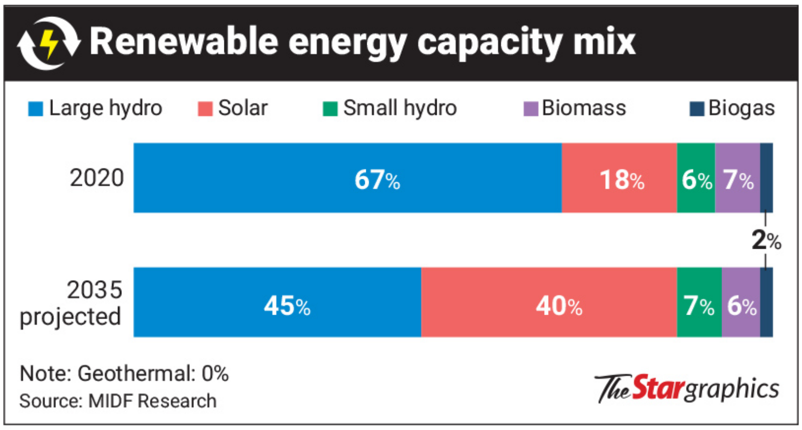
Figure 3: Malaysia's Total Primary Energy Supply by Fuel Type from 1990 to 2019



Source: Malaysia Energy Statistics Handbook 2021, Suruhanjaya Tenqga Energy Commission[8]

[8] https://www.st.gov.my/eng/general/add_counter/871/download/read_count

Figure 4: Malaysia's Renewable Energy Capacity Mix 2020 and 2035 Projections



Source: The Star and MIDF Research[9]

Energy Reserves, Imports and Exports.
Malaysia is blessed with abundant oil, natural gas, and a powerful state-owned energy company, Petronas. As expected, the country is a major producer and exporter of fossil fuels. However, there are some interesting trends to consider. Oil and condensate reserves, particularly in Peninsular Malaysia, have shown a steady decline since 2013, following a period of strong growth between 1990 and 2012. Similarly, natural gas reserves peaked in 2014 at 100.662 trillion standard cubic feet (TSCF) but have dropped by 21.4% since then. Despite shrinking reserves, Malaysia has seen a counterintuitive trend: rising net exports. Crude oil exports, for example, increased from 1,684 ktoe (kilo tonnes of oil equivalent) to 2,177 ktoe between 2013 and 2019. Similarly, net exports of total natural gas also improved by 10.89% during the same period.

There seems to be a disconnect between national aspirations and energy realities. While Malaysia aims to adopt more renewable energy sources, coal imports have skyrocketed. From 2009 to 2019, coal imports jumped by a staggering 115%. This trend is likely to continue, with Tenaga Nasional Berhad (TNB), the national power company, signing a 3-year contract in 2022 to import USD 3 billion worth of coal from Indonesia[10]. This highlights a complex situation. Malaysia is capitalizing on its existing resources through rising exports, yet its reliance on fossil fuels, particularly coal, continues to grow despite a push for renewables.

Energy Transformation.
Once raw energy sources are supplied, they are then transformed for their intended uses. Looking at Malaysia's fuel input to power stations – coal and coke is now the largest contributor at 56.8% in 2019 compared to just 2%, 20 years prior – which is in tandem with the exponential rise of coal imports. Overall, Malaysia's power generation system remains heavily reliant on fossil fuels. A meager 7.2% of the fuel input for power stations comes from renewable sources, with hydropower leading the pack at 6.3%. Solar energy, despite the national push for renewables, contributes a mere 0.4%.

As for electricity generation by plant type, hydropower has shown some progress, increasing its share of electricity generation from 11.5% to 14.6% between 1999 and 2019, but the picture is far from ideal. Thermal power plants, notorious for their inefficiency and environmental impact, still dominate the

[9] https://www.thestar.com.my/business/business-news/2023/07/29/expediting-malaysias-energy-transformation-journey
[10] https://www.thestar.com.my/business/business-news/2022/05/31/tnb-inks-us3bil-coal-import-deal-with-indonesia

landscape, generating a staggering 81.5% of the electricity. This highlights the need for a more significant shift towards cleaner and more sustainable energy sources.

Energy Consumption.
In 2019, the transport sector led the way in terms of final energy consumption, accounting for 37.6%. This was followed by industrial usage at 28.5%, and non-energy use at 20.5%. Residential and commercial usage made up only 12% of the total energy consumption. These statistics provide valuable insights into which sectors should be prioritized when promoting renewable energy adoption awareness. When we look at fuel type, petroleum products resemble the largest share (at 47.9%) with three-quarters of all oil said to be used by transport[11]. Electricity follows behind at 28% with residential and commercial buildings said to cover half of Malaysia's total electricity demand.[12]

Malaysia has the potential.
Malaysia is blessed from a geographic point of view. The International Renewable Energy Agency (IRENA) has pointed out that Malaysia's strategic location within the Southeast Asia region brings about huge potential for hydro, solar and wind powered energy generation. For instance, Malaysia's location close to the equator means that we have high solar irradiation throughout the year while good wind streams from the Indian Ocean and the South China Sea resembles strong potential for large scale wind-powered generation plants to be located in areas like Mersing and Kuala Terengganu in the Peninsular Malaysia while Kudat in Sabah could be tapped into from the East Malaysia perspective[13].

On top of generous sunlight and relatively good wind streams, Malaysia is also blessed with abundant rainfall throughout the year, consistently ranking among the top 10 countries globally for annual precipitation.[14] This means that the source to power hydropower plants is in abundance. Bioenergy resources must also be considered given Malaysia's huge involvement in oil palm plantation and a rather strong agriculture sector.

However, to explore this further, it would be interesting to examine what are some challenges that are still present and what should be explored.

Challenges and Issues

As previously explored, it is clear that Malaysia grapples with significant challenges in its energy sector, including a low adoption rate of renewable energy and a continued heavy reliance on non-renewable sources. The situation is further complicated by the fact that imports of some non-renewable resources are on the rise. However, these are just the most visible issues. Are there other factors we should take into account?

The first challenge would be **monitoring**. As discussed, the National Energy Transition Roadmap (NETR) of Malaysia is a comprehensive strategic plan aimed at steering the nation's energy systems away from conventional, fossil-fuel-based sources towards cleaner, more sustainable alternatives. With close to seventy actionable line items spread across 30 different named stakeholders, the NETR presents a robust and collaborative approach to energy transition. However, this complexity also

[11] https://www.irena.org/Publications/2023/Mar/Malaysia-energy-transition-outlook
[12] Ibid.
[13] Ibid.
[14] https://ourworldindata.org/grapher/average-precipitation-per-year?tab=table

poses a significant challenge in terms of monitoring and tracking progress, especially for the everyday Malaysian citizen whom are equally interested in our energy transition. With such a multitude of stakeholders and line items, the question arises: how can progress be effectively tracked and communicated to the layman?

The next challenges are the **various gaps specifically related to adoption of solar energy**. Despite solar energy being poised to be the primary driver of Malaysia's energy transition – there are still various bottlenecks from both residential and industrial perspectives.

In recent years, the Sustainable Energy Development Authority (SEDA) has launched numerous government initiatives, offering tax incentives and fiscal support to promote renewable energy. One such initiative is the "Solar Boleh" program, spearheaded by The Ministry of Energy Transition and Water Transformation (Petra). Announced on May 6, 2024, this program provides access to solar installation schemes and financing facilities, aiming to boost solar installation among households. Given these circumstances, the question arises: Why is solar adoption among communities still low, despite the government's efforts and incentives?

The high base cost of solar panels remains a significant barrier. According to Zeth Lim, CEO of Verdant Solar Sdn Bhd, the average cost for solar installations for homeowners in Malaysia is around RM30,000, with prices ranging from RM18,000 to RM50,000 depending on the system size.[15]. Despite the provision of substantial incentives, the cost of adopting solar energy solutions remains higher than that of its alternatives. Although the prices of solar installations have been on a consistent downward trend, they are still in competition with electricity costs that are already subsidized, and a fossil fuel industry that is still heavily backed by TNB, as seen with increased imports of natural gas and coal over the years. So, the competition from traditional fuel is another challenge to consider.

Limited Public Awareness of Solar Energy is also another challenge that Malaysia faces in its renewable energy sector. Despite the increasing global emphasis on renewable energy, particularly solar energy, there appears to be a gap in public awareness in Malaysia. Studies have shown that Malaysians have limited knowledge about solar photovoltaic (PV) systems and the government's related programs and incentives. A publication The International Journal of Sustainable Construction Engineering and Technology (IJSCET) has compiled various studies conducted to study Malaysian's sentiment and general awareness of solar energy system[16] (see Figure 5)

Based on these studies conducted, some interesting data points pointed out were:

1. 70% claim that they are not aware of any solar panel suppliers in their local area[17]. This implies that there is a disconnect between awareness and practical knowledge or accessibility.
2. Over 63% of respondents were unaware of any government encouragement for renewable energy (RE) as a whole while approximately 51% did not know about the government incentive on RE.[18][19] This implies a lack of information and awareness about the benefits of renewable energy and the special incentives offered by the government.

[15] https://www.mida.gov.my/mida-news/solar-adoption-in-malaysia-made-affordable-with-govt-incentives/
[16] https://penerbit.uthm.edu.my/ojs/index.php/IJSCET/article/download/12352/5601
[17] https://discovery.ucl.ac.uk/id/eprint/10111070/1/Florez%20and%20Ghazali%202020%20-%20Barriers%20to%20Implementing%20Solar%20Energy%20Systems%20in%20Buildings_%20The%20Residents%20Perspective%20in%20Malaysia%20.pdf
[18] https://iopscience.iop.org/article/10.1088/1755-1315/268/1/012105/meta
[19] https://www.semanticscholar.org/paper/An-evaluation-of-the-installation-of-solar-in-in-Muhammad-Sukki-Ramirez-Iniguez/9720673ffdcf2ff473cac92a62c5f4b7d1f9c094

Figure 5: The Challenges in Adopting Solar Energy in Malaysia[20]

Challenges / Sources	Financial		Environmental		Socio-cultural
	Competition from traditional fuel	**High initial cost**	**Dependence on Weather**	**Associated with pollution**	**Limited public awareness**
U.S. Energy Information Administration (2021)	√				
Mostafaeipour et al. (2021)		√			
Irfan et al. (2021)					√
Agbo et al. (2021)			√		
Mostafaeipour et al. (2021)		√			
Florez and Ghazali (2020)		√			√
Khamisani (2019)			√		
Zakaria et al. (2019)					√
Shaikh (2017)		√	√		
Lofthouse et al. (2015)		√		√	
Minerals and Geoscience Department Malaysia (2011)	√				
Muhammad-Sukki et al. (2011))	√				√
Li et al. (2020)				√	
Malik and Ayop (2020)					√
Berger et al. (2010)				√	
Al-Amayreh and Alahmer (2022)			√		
Othman et al. (2008)	√				

Source: The International Journal of Sustainable Construction Engineering and Technology (IJSCET)

Overall, this underscores the need for increased public education and outreach to promote the adoption of solar energy in Malaysia. Other than awareness and financial cost – policies underlying the transition are also important elements. Let's also consider the evolution of energy-related policies in Malaysia:

1. **Feed-in Tarriff (FiT policy): 2011 to 2016**

FIT is the policy that came into effect early 2011 after nearly 7 years of effort[21]. This policy brings about a payment system which permits the selling of electricity produced by a user to the grid where the end goal is to drive up usage of solar energy. According to Sustainable Energy Development Authority Malaysia (SEDA Malaysia) – the basic concept underlying FiT is classified as "the Distribution Licensee pays the Feed-in Approval Holder a premium tariff for clean energy that is generated. This allows owners to sell their clean energy to the distribution licensee for a fixed number of years; the duration is dictated by the type of renewable energy used for power generation. The incentive provides a fixed payment from the electricity supplier for every kilowatt hour (kWh) of electricity generated and a guaranteed minimum payment for every kWh exported to the grid."[22] Under this policy, four renewable energy resources were identified as eligible: biogas, biomass, small hydropower, and solar photovoltaic. However, it appears that the Feed-in Tariffs (FiT), specifically for Solar Photovoltaic, have ceased accepting new registrations, according to multiple sources. [23] [24]. This is further suggested by the introduction of the Net Energy Metering (NEM) mechanism in November 2016[25]

[20] Ibid.
[21] https://www.seda.gov.my/reportal/fit/#:~:text=Currently%2C%20all%20new%20approved%20FiT%20applications%20%28regardless%20of,would%20be%20paid%20the%20FiT%20for%2016%20years.
[22] https://seda.gov.my/wp-content/uploads/2018/12/FiT-Brochure.pdf
[23] https://www.azmilaw.com/insights/legal-updates-on-the-solar-energy-industry-in-malaysia/
[24] https://www.mondaq.com/renewables/1046920/legal-updates-on-the-solar-energy-industry-in-malaysia
[25] https://www.seda.gov.my/reportal/nem/abouts-nem-3-0/#:~:text=The%20Government%20has%20introduced%20the%20Net%20Energy%20Metering,2020%20to%20encourage%20Malaysia%E2%80%99s%20Renewable%20Energy%20%28RE%29%20uptake.

Despite being a fairly effective policies, the FiT system still faces several challenges. A study suggest that high energy production might result in a negative rebound effect (where benefits of increased renewable energy production are offset by increased energy consumption) if FiT rates exceed electricity prices (which increases electricity consumption)[26]. Additionally, the risk of unlimited curtailment without compensation also arises with the FiT system. This was seen in Japan whereby the study on Japan's FiT usage suggested that that electricity producers may not be compensated for their production if the grid is unable to accommodate it, which can lead to financial losses for the producers.[27]

2. **Net Energy Metering System (NEM: 2016 to 2023 (split into 3 different phases – NEM, NEM2.0, NEM3.0).**

According to SEDA, NEM runs on a concept whereby the energy produced from a solar photovoltaic (PV) installation will be consumed first and any excess will be exported to TNB at the prevailing displaced cost.[28] However, as observed by INSAP and stressed by SEDA themselves – the uptake was poor. With this, they introduced NEM2.0 in 2019 where the true net energy metering concept was adopted, allowing excess solar PV generated energy to be exported back to the grid on a "one-on-one" offset basis. While this brings about the benefit of "saving money", there is essentially no financial benefits as the mechanism omits the ability to earn cash which was present in the FiT system. Thereafter, NEM3.0 was introduced in 2021 after the 500MW quota under the NEM 2.0 has been fully subscribed by 31st December 2020.[29] The concept of NEM 3.0 was said to replicate NEM 2.0 but offered 2 additional elements – it allowed indirect connection for commercial buildings with rates for exported kWh being less than price of kWh for commercial buildings[30]. The NEM 3.0 which started in 2021 was extended with additional quotas as per PETRA's announcement on 26th January 2024[31]. According to PETRA, the quotas will run until end of 2024 or until all quotas are allocated – whichever comes first. Figure 6 shows how the NEM 3.0 is divided:

Figure 6: Categories under NEM 3.0

Initiative/Categories	Quota Allocation (MW)	Quota Opening Date
NEM Rakyat Programme	350MW	1st February 2021 – 31st December 2024
NEM GoMEn Programme (Government Ministries and Entities)	100MW	1st February 2021 – 31st December 2024
NOVA Programme (Net Offset Virtual Aggregation)	1100MW	1st April 2021 – 31st December 2024

Source: Sustainable Energy Development Authority (SEDA) Malaysia[32]

A key distinction between Net Energy Metering (NEM) and Feed-in Tariff (FiT) policies lies in the absence of financial incentives under NEM. This lack of financial support can be seen as a major drawback for NEM adoption. Additionally, the limited capacity (quota allocation) for NEM participation could further hinder its widespread uptake. Experts, including Davis Chong, President of the Malaysian Photovoltaic Association, have highlighted another weakness of NEM, particularly NEM 3.0. In a

[26] https://link.springer.com/article/10.1007/s10018-021-00306-w
[27] https://www.renewable-ei.org/en/activities/reports/20170810.html
[28] https://www.seda.gov.my/reportal/nem/
[29] Ibid.
[30] https://www.mdpi.com/2071-1050/13/17/9959
[31] https://www.seda.gov.my/reportal/nem/
[32] Ibid.

podcast with The Business FM (BFM) Malaysia[33], Mr. Chong pointed out the lack of clear information regarding what happens after the quota is reached. He emphasizes the need for program continuity, which could involve reducing or eliminating the "window period" with no quotas between program cycles.

Policy Considerations.

While the NETR document itself does not explicitly detail a tracking mechanism, it is crucial that such a mechanism be established. This could potentially take the form of a publicly accessible dashboard or report that provides updates on the status of each line item. Such a tool would not only ensure transparency and accountability but also allow every Malaysian to understand and engage with the nation's energy transition journey.

The government should consider re-exploring the FiT system to bring back the element of financial benefits. However, the administration must restudy prior to reduce magnitude of potential issues like the risk of unlimited curtailment without compensation and unsustainable pressure on the grid (as customers sends all PV produced energy to the grid)

Next, investing in renewable energy research pays off. A great example is the breakthrough by MIT engineers in late 2022.[34] They developed ultralight fabric solar cells that can transform any surface into a power source. These cells are incredibly lightweight – one-hundredth the weight of traditional solar panels – and generate a much higher power output per kilogram (18 times more). The key to their affordability lies in the production process. They're made with semiconducting inks and use scalable printing techniques, making large-scale manufacturing a possibility in the future. This significantly reduces production costs compared to traditional methods. Malaysia can achieve significant benefits by replicating similar innovations. Not only would it position us as a pioneer in renewable energy technology, but it would also unlock economic advantages. We could become an exporter of this technology, while offering Malaysians a more affordable and accessible clean energy option.

We also need to provide additional incentives for residential property developers to incorporate solar panels into their projects. By reducing regulatory barriers for solar energy initiatives, we can encourage broader participation from both consumers and developers. One significant bottleneck is that homeowners still largely need to take the initiative to install solar panels themselves. To address this, it's crucial to educate households, particularly those in rural areas, about the long-term benefits of solar panels. This combined approach will promote the adoption of solar energy, ultimately contributing to a more sustainable future.

Strained Wallets: Why a Slow Energy Shift Could Cost Malaysians Dear

For the average Malaysian, the implications of a sluggish transition to renewable energy sources could be significant. The primary impact would be an increase in the cost of living, as a continued reliance on non-renewable commodities could drive up everyday expenses. There are mainly two reasons for this; the first reason would be that the **supply of these non-renewable commodities is finite** and this can affect our costs in various ways. For instance, if local reserves of primary non-renewable

[33] https://www.bfm.my/podcast/morning-run/the-breakfast-grille/clean-energy-day-solar-malaysia-netr-renewable
[34] https://news.mit.edu/2022/ultrathin-solar-cells-1209

energy source that are utilized for energy generation dwindles in supply, the cost to generate products of raw energy using local reserves (for instance, electricity) would rise. The basic economic concept of scarcity argues for this whereby as a resource becomes scarcer, the competition to acquire it intensifies, driving the prices up.

Additionally, when reserves start to drop and if the country is still heavily dependent on these non-renewable sources– the administration would turn to importing more raw energy sources. An increase in imports of energy can be subject to several external factors that can further increase the cost of living for Malaysians as electricity, transport and anything that essentially runs on power generated by these energy sources would essentially increase in costs. These external factors would include global market fluctuations, currency exchange rates (where our Ringgit has consistently weakened over the past years, making most imports relatively more expensive) and trade policies. These externalities essentially bring us to the second reason which is **geopolitical tensions.** Given how interconnected economies are (excluding those that primarily leverage on inward-oriented policies), any conflict or even political instability can result in economic shockwaves from one region to another.

For example, the Ukraine-Russia conflict (2022 to present) has had a significant impact on global energy markets, leading to price volatility, supply shortages, security concerns, and economic uncertainty (Figure 5). A notable consequence has been the surge in oil prices; in the early stages of the conflict, oil prices reportedly surpassed USD$100 per barrel for the first time since 2014.

This was evident in 2023 when certain domestic users faced higher tariffs, with TNB attributing the rise in global fuel prices as the reason they couldn't maintain stable electricity rates. [35] It's worth noting that TNB has operated under a mechanism known as the Imbalance Cost Pass-Through (ICPT) since 2015, allowing them to adjust consumer electricity tariffs every six months based on changes in fuel and generation costs. With this mechanism in place, any sustained long-term increase in energy prices could lead to higher electricity tariff rates every six months for Malaysians

In contrast, if renewable energy sources were the primary source of usage, Malaysians would be shielded from these external volatilities. Solar, wind, geothermal, and hydropower are all domestic resources, meaning their prices wouldn't be subject to global market fluctuations or currency exchange rates. While initial investment costs for renewable infrastructure might be high, the long-term operational expenses are significantly lower. This translates to more stable and predictable electricity costs for consumers, ultimately leading to a lighter burden on household budgets**.** Furthermore, increased reliance on renewable energy would enhance Malaysia's energy security. By reducing dependency on imported fossil fuels, the country becomes less vulnerable to supply chain disruptions caused by geopolitical conflicts. This ensures a more reliable and sustainable energy supply for future generations.

Carbon tax – a matter of time but Malaysia is not ready.

As the European Union (EU) gears up to implement its Carbon Border Adjustment Mechanism (CBAM) in 2026, it is crucial for trading partners like Malaysia to consider the introduction of carbon taxation, especially given our robust export relationship with the EU.

[35] https://api.nst.com.my/news/nation/2023/08/948161/energy-prices-why-power-bills-are-going

Understanding the concept of carbon taxation is essential. PWC Malaysia views it in tandem with carbon pricing and carbon trading. Lavindran Sandragasu, a tax partner at PWC Malaysia, explained to The Edge that carbon pricing assigns an economic value or price to carbon emissions. One straightforward method to implement carbon pricing is through a tax levied per tonne of carbon dioxide equivalent (tCOe).[36]

Another mechanism is carbon trading, which involves setting a cap on greenhouse gas (GHG) emissions for each company. Companies with low emissions can sell their excess quota, while those with higher emissions can purchase additional quotas to meet regulatory requirements. Carbon trading can complement carbon taxation. For instance, if Company A reduces its emissions below the taxable threshold, it may still need to buy a quota from the government or other companies to fully offset its minimal GHG emissions.[37]

Is Malaysia ready for a carbon tax? Recent discussions among Malaysian political leaders indicate that the imposition of a carbon tax in Malaysia is inevitable. The pertinent question is not if but how and when it will be implemented. Given Malaysia's reliance on fossil fuels and its role as an oil and gas producer, the country faces inherent challenges in adopting a carbon tax.

Perhaps the focus should be on accelerating the development of infrastructure needed for our ongoing energy transition rather than pinpointing the exact timing for implementation. Currently, solar power generation is insufficient to replace coal and natural gas given the lack of wide scale adoption primarily from a domestic (or consumer) point of view, and while hydropower holds promise - tangible efforts are lacking particularly in Peninsular Malaysia.

Additionally, the potential rationalization of RON95 subsidies in the coming months could lead to market pricing for electricity, causing prices to soar. This would have a ripple effect on the cost of living, affecting our *rakyat.* Given the current economic conditions, is Malaysia truly prepared for such a shift? Is another tax really the answer?

INSAP believes might be more prudent to concentrate on enhancing our energy transition infrastructure or consider implementing regulations on non-renewable energy producers that has yet to put forward any efforts to transition, as interim measures. Only after these steps can we consider carbon taxation, given our current energy and economy landscape.

All in all, while Malaysia possesses substantial potential for renewable energy adoption, we face significant challenges in transitioning to a renewable energy future. The foundations being laid for our lofty goals, as outlined in the National Energy Transition Roadmap (NETR), require effective policy implementation. This includes reconsidering the Feed-in Tariff (FiT) system used in the early 2010s and establishing a clear and transparent tracking system for progress within the NETR framework. Additionally, raising public awareness is essential. All these elements must be considered and implemented by the Madani administration if they are truly serious about propelling Malaysia towards becoming a sustainable and economically stable nation.

// END.

[36] https://theedgemalaysia.com/article/special-report-12th-malaysia-plan-2021-2025-malaysian-case-carbon-tax
[37] Ibid.