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National Climate Strategy: A Balanced Approach

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Khazanah Research Institute

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Executive Summary

What is an adequate strategy for Malaysia to manage the physical and external risks of climate change?

Based upon an analysis of the scientific, legal, policy and political context, as well as comparative emissions data, this paper explores the need for a balanced approach to both climate mitigation and adaptation while pursuing sustainable development via a national climate strategy.

A national climate strategy would need to reconcile national development strategy and grand strategic aims. Effective formulation rests on understanding international climate laws, Malaysia's climate data in comparison with other countries, Malaysia's climate vulnerabilities, and current policy environment. Effective operationalisation rests on participation in diplomatic coalitions in international climate fora in order to overcome Malaysia's middling geopolitical power and ensure credible action by developed countries leading towards climate stabilisation.

Such efforts should be consistent with the principle of 'common but differentiated responsibilities and respective capabilities' underpinning the United Nations' Framework Convention on Climate Change and its Paris Agreement, where developed countries are legally obligated to take the lead in emission reductions due to their disproportionate historical responsibility and accumulated financial and technological capability.

Malaysia's ability to contribute towards global climate stabilisation is limited by its small share of global emissions (0.37% as of 2020). Developed countries have greater responsibility and capability to deliver the deep rapid cuts in emissions required to limit warming to 1.5°C over pre-industrial levels. Malaysia's mitigation agenda should prioritise diplomatic pressure, followed by domestic action towards sustainable development pathways. A national net-zero target is not a sufficient condition to realise the global net-zero emissions recommended by science. A mitigation strategy with no clear sectoral apportionment of responsibility could lead to inefficient adoption of mitigation measures by too many actors.

A balanced national strategy would give a greater role to climate adaptation. This would help tackle current and future climate change impacts that Malaysia is facing. However, it needs to be well articulated to manage international expectations which are focused on mitigation.

Malaysia should carefully evaluate policy imports concerning mitigation or adaptation in order to avoid adverse development outcomes. Such solutions may not be effective or universal for developing countries. They may be context-dependent based on historical emissions, current emissions pathway, and accumulated financial and technological capability. Committing to climate policies such as carbon pricing and global pledges with no implementation support from developed countries may conflict with achieving Malaysia's sustainable development objectives.

Insufficiently contextualised policy imports can result in delay and a diversion of scarce resources away from addressing more pressing climate impacts. For countries with relatively small emissions, climate stabilisation requires international diplomatic pressure on the largest historical global atmospheric polluters for deep, credible cuts and removals.

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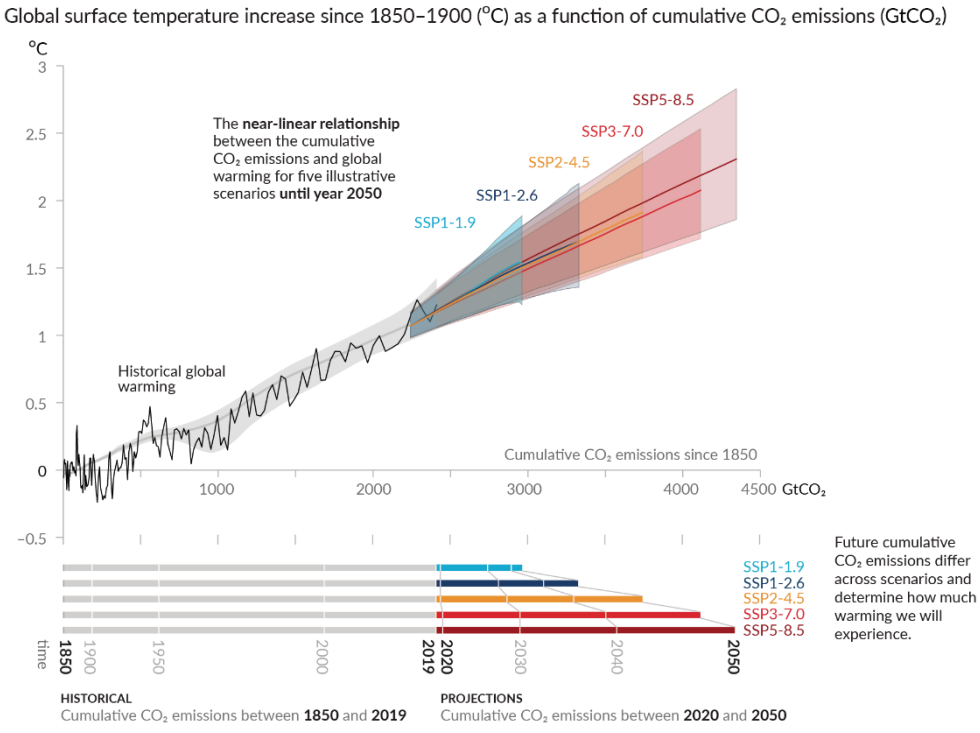
1. Introduction

Climate change is a complex topic. One that stretches beyond the weather and its long-term average, to encompass the nature of economic development and potentially, its limits.

Over the past two hundred years, a minority of countries – mostly in Europe and North America – have engaged in heavy use of fossil fuels to power their industrialisation and mobility. Combined with deforestation this has led to human-induced (anthropogenic) changes in the composition of the atmosphere. Carbon dioxide, the principal pollutant resulting from these processes, is a potent greenhouse gas (GHG) trapping solar energy in the atmosphere. This drives global warming and climate change.

Carbon dioxide (CO_2) can persist in the atmosphere for hundreds to thousands of years. According to the United Nations' climate science body, the Intergovernmental Panel on Climate Change (IPCC), there is a "near-linear relationship" between cumulative anthropogenic CO_2 emissions and the global warming they cause (see Figure 1)[1]. Warming is happening because the rate and volume of emissions are exceeding the capacity of natural and human systems to balance them.

Figure 1: Near-linear relationship between cumulative CO_2 emissions and the increase in global surface temperature



Source: IPCC (2021)

[1] IPCC (2021)

The climate changes we are witnessing today are the result of greenhouse gas emissions emitted since the 18th century, with the advent of Britain's Industrial Revolution[2]. The subsequent industrialisation of the United States, Europe, Russia and Japan has been a major contributor to emissions and global climate change.

Our Climate Challenge

Humanity's challenge is to stabilise the climate by limiting further warming of the atmosphere to ideally 1.5°C over pre-industrial levels, or at most 2°C, according to the 2015 Paris Agreement on climate. This means limiting or removing human-induced greenhouse gas emissions to reach net-zero anthropogenic CO_2 emissions within a given carbon budget[3].

For 1.5°C, the UN's IPCC says that this would involve global emissions peaking "before 2025 at the latest, and be reduced by 43% by 2030." The 2°C goal "still requires global greenhouse gas emissions to peak before 2025 at the latest, and be reduced by a quarter by 2030"[4].

The disruptive climate changes we are currently experiencing are occurring at a warming of 1.2°C over the 1850-1900 average[5], and we are likely headed for 3°C warming if nothing is done[6].

No Safe Level of Warming

The target temperatures of "1.5°C" and "at most 2°C" were politically negotiated goals informed by scientific advice[7]. They do not represent 'safe' levels of global heating. Even in the best case scenario of countries successfully meeting the 1.5°C goal, this will bring with it guaranteed climate change impacts that include sea level rise, extreme rainfall and heatwaves that would become more frequent and severe, as well as the destruction of 70% of coral reefs worldwide. However, at warming of 2°C more than 99% of coral reefs would be lost[8].

A modelling exercise by insurer Swiss Re suggested ASEAN stands to lose 47% of its GDP by 2048 under a warming scenario of 3.2°C. Malaysia was projected to be one of the worst affected with a projected GDP loss of 46% relative to 2019 levels[9].

Therefore, countries not only need to manage their emissions while balancing their social and development needs, they also need to adapt to climate change. Different levels of warming will require different adaptation measures in order to achieve climate resilient development. Thus, countries need to manage risk and uncertainty.

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[2] IPCC (2021)
[3] IPCC (2021)
[4] IPCC (2022a)
[5] UNFCCC (2022)
[6] IPCC (2021)
[7] The +1.5^{0}C goal was pushed by small island developing states who face the greatest existential threat from rising sea levels.
[8] Reuters (2021)
[9] Swiss Re Institute (2021)

According to the IPCC, the 'safest' outcome would involve going to net negative global CO_2 emissions. This would involve *removing* emitted carbon dioxide from the atmosphere and fixing it in stable form, within geological or territorial constraints. Even then, current science says "it would take several centuries to millennia for global mean sea level to reverse course even under large net negative CO_2 emissions"[10].

Climate Adaptation is Important but There are Limits

Therefore, while climate adaptation measures need to be robust in the long-term there will be some places where the limits of adaptation will be exceeded. This is why climate change is an existential issue for small island states and coastal areas. Malaysia has an extensive coastline and its islands host significant settlements and tourist attractions. Within international climate talks discussions of payment for 'loss and damage' due to irreversible impacts are only recently starting to get the attention they deserve. Developing countries, especially island states, want them on the agenda, while developed countries are wary of acknowledging the case for climate 'reparations'.

While scientists are calling for global emissions to peak before 2025, in 2022 the world is experiencing major disruptions. Pandemic shutdowns did not slow the growth rate of CO_2 emissions[11]. Economic reopening in 2021 has run into financial turbulence, inflation, war between Ukraine and Russia, a consequent energy crisis in Europe, escalated economic conflict between US and China, while monetary and fiscal policy moves in advanced economies risk global recession and prolonged stagnation[12]. The present crisis involves the world's four largest cumulative CO_2 emitters – the US, EU, China and Russia – with major long-term economic impacts for Russian gas exports and Chinese technological ambitions currently emerging.

It may now dawn upon the reader that achieving "net-zero by 2050" for Malaysia or individual firms will not be enough to achieve climate security. Even if everyone in Malaysia 'plays their part' and 'does their bit', there are nations with a far greater role to play if global climate goals are to be met. Malaysians have to negotiate climate change in an uncertain present and an uncertain future. Achieving sustainable development amidst adverse global economic and climatic conditions will require strategy.

Malaysia's Strategic Challenges

The challenge at the country and firm level is multiple:

1. Pursuing sustainable development without exceeding planetary boundaries;
2. Avoiding adverse social and economic consequences of climate-related policy transition (especially emissions reduction policies); and,
3. Withstanding the current and future local physical impacts of a changing climate.

[10] IPCC (2021)
[11] IPCC (2021)
[12] UNCTAD (2022)

For developing countries such as Malaysia, there are additional challenges:

4. Limited fiscal and technological capacity slows transition and limits their ability to capture opportunities for industrial upgrading;
5. Taking appropriate measures to mitigate unfair climate-related protectionist measures imposed by developed countries; and,
6. Ensuring that developed countries – the world's biggest carbon polluters – fulfil their international obligations to:
    a. Make emissions cuts deep enough to stabilise the climate; and,
    b. Meet their climate agreement commitments to contribute finance and technological assistance to help developing countries survive in a climate changed world.

Achieving a balanced and judicious approach to the climate challenge will not be easy, but any national strategy that fails to reconcile all these challenges with Malaysia's development ambitions risks leaving us unprepared to face climate impacts and/or imposes unfair economic burdens on the Malaysian economy, its firms and households. This calls for a realistic assessment of Malaysia's responsibilities, capacities and options for climate action.

We begin with a look at recent climate-related events and policy developments in Malaysia.

2. Our Climate Present

2.1. A Taman called Sri Muda

A tropical depression in December 2021 brought several days of unprecedented continuous rainfall, which translated into weeks of floods and landslides. Some of the worst-affected areas were those on the west coast of the Malay Peninsula, such as Taman Sri Muda in Selangor, which was flooded for nearly a week with water as deep as 4m in some areas[13]. A number of residents were trapped on their roofs for two days, others had no fresh food for up to four days, resorting to using toilet bowl water to prepare food before fire services finally evacuated them[14].

A relatively lower-income area, Taman Sri Muda's vulnerability to extreme weather appears to have been exacerbated by poor governance decisions, stemming from the original decision to develop a meander of the Klang River. Meanders are curves in a river produced by erosion. Over time erosion narrows the neck of a meander loop, from a u-shape to something like the Greek letter Ω. Eventually, it becomes an oxbow lake 'cut off' from the river. Taman Sri Muda occupies a square-shaped meander loop, surrounded on three sides by the Klang river, with the raised ground of the E13 highway enclosing it on the fourth, making the area a ready respository for water overflow.

The housing and industrial area had last experienced a major flood in December 1995. In response, the state government undertook flood mitigation measures, establishing a retention pond, drainage canals, a tidal gate and an ad hoc pump system to transfer excess water into the Klang River. Over the years, Kemuning Utara, Kemuning Baru, Kota Kemuning and other upstream areas surrounding Taman Sri Muda were developed and neglected to develop their own drainage systems, instead piggybacking on the system in Sri Muda, effectively turning Taman Sri Muda into a giant retention pond for the area[15]. Taman Sri Muda's flood mitigation system, such as it is, was never designed to bear the load of more than one neighbourhood, let alone four or more. Despite RM10 million allocated in 2020 to upgrade the pump system, by the time the December 2021 floods came work had yet to begin and one of the pumps was broken. Residents had apparently been calling for action since 2019[16].

The case of Taman Sri Muda suggests that place-based vulnerability to extreme weather can be a complex function of geography, governance, power differentials, access to resources, as well as the exacerbating impact of human-induced climate change, which stimulates more extreme weather events[17]. As Malaysia and other countries confront the challenge of climate change, there will be a need to address not only the greenhouse gas emissions that cause climate change – an effort that ultimately requires international coordination under the auspices of the United

[13] FMT (2022)
[14] The Vibes (2022)
[15] FMT (2022)
[16] FMT (2022)
[17] Thomas, et al. (2018)

Nations – but to also adapt to climate change impacts by reducing vulnerabilities that emerge from the intersection of multiple factors at the national and local level.

2.2. An exceptional La Niña

Coinciding with high tides, the volume of rainfall in Selangor reached 380mm in December 2021, more than twice the previous record of 180mm, and more than six times the average of 60mm[18]. Over on the east coast of Peninsular Malaysia, sometimes thought to be more inured to the threat of floods, the municipality of Temerloh in Pahang was inundated for days. It had previously been flooded in January 2021. Many other parts of the country experienced floods and displacement.

The government and the National Disaster Management Agency (NADMA) were caught unprepared for the scale and extent of the disaster[19], which was the worst since the floods of 2014-2015 that primarily affected the east coast of the Peninsula. This time, over 71,000 people were displaced, at least 54 died and two persons went missing.

The total damage accrued for this month of disruption resulting from several days of excessive rainfall was estimated by the Department of Statistics under the Economic Planning Unit to amount to RM6.1 billion.[20] The damage in the economic heartland of Selangor alone amounted to RM3.1 billion. Less easy to quantify is the long period taken to rehabilitate flood and landslide damage, some of which remained incomplete nearly a year later[21].

In May 2022, the Meteorological Department had originally forecasted the Southwest Monsoon to bring hot weather from July to September 2022[22]. However, those months saw relatively wet weather and areas such as Baling, Kedah subjected to floods in July, August, September and October. The July floods affected 41 areas and resulted in an estimated RM28 million damage and three lives lost, including a 23-year old pregnant woman.[23] Why was the weather wet instead of hot as originally forecasted?

Temerloh's flooding in January 2021 coincided with the beginning of the 21st century's first 'triple dip' La Niña, which thus far has spanned "an exceptional" three northern hemisphere winters and the World Meteorological Organisation (WMO) projects to continue until at least early 2023[24]. Three year La Niña's have only happened twice since 1950[25]. Malaysia's Metereological

[18] The Star (2021)
[19] FMT (2021)
[20] This was roughly equal to the amount allocated for Malaysia's national COVID-19 vaccination programme, the funds for which came out from the National Trust Fund (Kumpulan Wang Amanah Negara), a 'rainy day' sovereign wealth fund that is largely funded by contributions from PETRONAS, Malaysia's national oil company. DOSM (2022)
[21] Field visit to Kg Palimbayan, October 2022.
[22] The Star (2022)
[23] Malay Mail (2022)
[24] WMO (2022)
[25] Bloomberg (2022)

Organisation expects La Niña in 2022 to lead to a repeat of December 2021's destructive rainfalls[26].

La Niña refers to the large-scale cooling of the ocean surface temperatures in the central and eastern equatorial Pacific Ocean, coupled with changes in the tropical atmospheric circulation, namely winds, pressure and rainfall. La Niña (Spanish: 'the girl') usually has the opposite impact on weather and climate compared to El Niño (Spanish: 'the boy'), which is the warm phase of the so-called El Niño Southern Oscillation (ENSO)[27].

While in Southeast Asia, El Niño is associated with drought and forest fires, La Niña brings wetter weather, but in the Horn of Africa it is worsening a devastating three-year drought affecting millions[28]. Drought in Texas has affected cotton production. Dry weather from this La Niña has impacted coffee, sugar, orange, and soybean yields in Brazil, which is the world's biggest exporter of all four commodities. In Argentina, the multi-year drought has dried out the Parana river, a key shipping route, forcing farmers and agricultural traders to export out of alternative ports. Weather-related damages due to the three-year La Niña could rise to $1 trillion by the end of 2023[29].

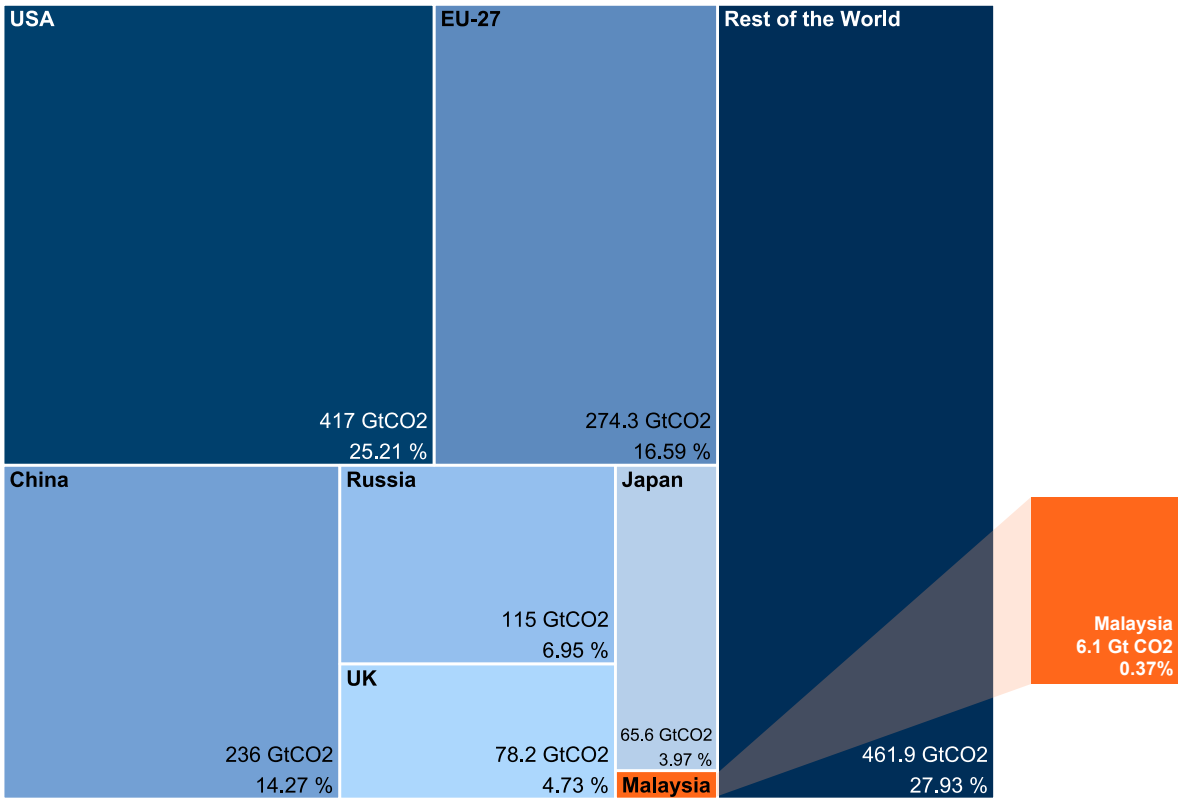
2.3. Climate vulnerability and responsibility

India and Pakistan experienced scorching summers in 2022, but with the coming of the monsoon Pakistan received more than three times its usual rainfall in August. The Indus River burst its banks while flash floods and landslides led to 33 million people being displaced – equivalent to the entire population of Malaysia – destroyed 1.7 million homes, while nearly 1,500 people lost their lives[30]. Pakistan's climate change minister Sherry Rehman was among many who drew a link between the disaster and Pakistan's low contribution of the greenhouse gas emissions that are driving climate change – less than 1% of global emissions[31].

In fact, Pakistan's contribution to historical carbon dioxide emissions is far smaller, at 0.30% it is nearly the same as Malaysia's 0.37% as of 2020. Whereas just six nations – the US, EU, China, Russia, UK and Japan – are responsible for over 70% of historical carbon dioxide emissions and represent the largest economic powers in the world, with the US alone responsible for over 25% (see Figure 2).

[26] Sinar Harian (2022)
[27] WMO (2022)
[28] WMO (2022); WHO (2022)
[29] Bloomberg (2022); Gro Intelligence (2022)
[30] World Weather Attribution (2022)
[31] Rehman (2022)

Figure 2: Big Six Emitters, Malaysia and the Rest of the World. Percentage shares of historical (cumulative) carbon dioxide emissions from 1751 to 2020 (gigatons of carbon dioxide, $GtCO_2$)



Note: The 27 members of the European Union (EU) are grouped together since they are a common negotiating bloc in climate talks.
Source: Global Carbon Project (2021); KRI/Khoo Wei Yang

It is important to note here that in 2020, China's population of 1.4 billion people was larger than the 1.1 billion residing in the other 'Big Five' polluters combined[32]. While the Big Five combined were equivalent to 79% of China's population in 2020, their historical emissions were four times greater.

While all countries are more or less vulnerable to climate change, each country also varies in its historical responsibility for climate change. Countries such as Malaysia and Pakistan, being latecomers to industrialisation, have contributed very little to climate change compared to the United States and the European Union, who have been consuming large amounts of fossil fuels for over two hundred years. China, despite its large population, has only recently come to relative prosperity in this period. Countries also vary in their financial and technological capabilities to reduce or limit the growth of their emissions, or adapt to climate change.

Contemporary diplomatic and moral pressure from the US and EU on China and India's emissions tends to conveniently ignore the issue of historical or per capita emissions and focuses instead on present and future emissions where developed nations have the advantage of smaller

[32] World Bank (n.d.)

demographics, greater fiscal space and more advanced energy technologies. Disentangling economic rivalry from climate concerns is difficult.

A Question of Climate Justice

Should poor, climate vulnerable countries with little contribution to historical anthropogenic emissions have the same responsibilities as rich countries with significant greenhouse gas emissions?

How do poor developing countries resolve the tension between meeting international climate goals and pursuing sustainable development to alleviate poverty and uplift their people?

The trickier question to resolve is what are the appropriate strategies for middle-income developing nations such as Malaysia. Failing to incorporate economic strategy into climate strategy can mean compromising long-term development objectives. Likewise, failing to incorporate climate change into long-term development strategy can leave vulnerabilities unresolved or risk catastrophic damages.

Understanding emissions data, in particular historical responsibility for climate change, is important for understanding how Malaysia, or any given country's, responsibilities under international climate treaties are to be fulfilled, and burdens fairly apportioned.

Springing into 'climate solutions' imported from large polluter countries without consideration of emissions data or treaty obligations could result in the misallocation of capital and its potential diversion from addressing near-term national physical climate impacts. Simply put, as a small emitter nation, overemphasising reducing greenhouse gas emissions may leave us unduly prepared to redress our vulnerabilities to climate change.

2.4. Is Malaysia "not a climate vulnerable country"?

In order to understand why some headline climate policies get made, it is important to understand the interaction of politics and climate change.

In April 2021, the then Minister for Environment and Water, Tuan Ibrahim Tuan Man, was initially reported as stating that Malaysia was not invited to the Leaders Summit on Climate convened by the new US President Joseph Biden because it was "not a climate vulnerable country"[33].

Tuan Ibrahim was responding to criticism by opposition politician Lim Guan Eng, who had previously been Minister of Finance (2018-2020). Lim had claimed that Malaysia was excluded from the US climate summit because of its poor record of importing plastic waste. Lim asked, "why Vietnam can be invited, but Malaysia was excluded from this summit"[34].

[33] Awani (2021); Malaysiakini (2021a)
[34] Malaysiakini (2021b)

However, the Leaders Summit on Climate was about neither plastic waste nor climate vulnerability. The Environment and Water Ministry later issued a clarification that "the summit's objective was to encourage large economies to collectively contribute to a reduction in greenhouse gases"[35]. In the words of the US State Department:

> The Summit, which was the largest virtual gathering of world leaders, convened the world's 17 largest economies and greenhouse gas emitters and included the leaders of other countries especially vulnerable to climate impacts or charting innovative pathways to a net-zero economy[36].

It was supposed to serve first as a political platform showcasing Biden bringing the US back into international climate politics – a key differentiation of Democrats from Republicans; the latter have a tradition of withdrawing from international climate agreements. Secondly, with Britain taking the climate limelight as host of the Glasgow 2021 COP26 conference, it attempted to bolster US leadership on the issue by convening the largest economies and polluting countries, of which the US is number one. Malaysia was not invited because it is not one of those big polluters, and while vulnerable to climate change it is not a highly vulnerable small island state.

Climate change can be challenging for policymakers to make sense of. Its complex mix of international diplomacy, industrial policy and science can go beyond any one individual's experience and knowledge. It upends conventional assumptions about advanced economies such as the US and EU being models of behaviour and development when the US and EU are the two biggest historical climate polluters.

The Growing Political Salience of Climate Change

In the last twenty years climate change has become salient in politics. Climate has become a way for politicians to signal credentials to both international and domestic audiences. Its benefit for domestic politics depends on whether the signalling is complementary to their country's fundamental strategic interests, or contrary to it.

Biden's climate strategy is designed to distance himself from his predessor Donald Trump and cater to the demands of his Democratic voter base, which supports action on climate change[37]. Renewing US participation in international climate fora reverses an earlier decision by Trump to withdraw from the Paris climate agreement[38].

Similarly, newly-minted Brasilian President Luiz Inacio Lula da Silva devoted a portion of his October 2022 victory speech to highlight climate and environmental policy differences with his Trumpian predecessor Jair Bolsonaro[39]. Bolsonaro had presided over a surge in Amazonian

[35] Malaysiakini (2021a)
[36] US State Department (2021)
[37] Pew Research (2022)
[38] BBC (2020)
[39] Reuters (2022a)

deforestation and had at one point pledged to withdraw from the Paris Agreement. Lula soon announced that he would be participating at the 2022 UN climate meeting in Egypt[40].

In both the US and Brasilian cases, climate policy signalling also facilitates policy outbidding of domestic political rivals adverse to climate measures. In Malaysian politics, climate concerns are shared across partisan lines, though they are rarely featured in manifestos or in debates between high-level leaders. Thus, there is lower utility for domestic political outbidding as in the US and Brasilian cases.

Malaysian International Climate Policy Signalling

In Malaysia's case, two out of four past Prime Ministers have chosen to make major statements on climate policy soon after they assumed office. Notably, the policies announced were framed in terms of emissions reduction salient to developed countries. Under the UN climate convention developing countries such as Malaysia are not expected to take the lead in emission reductions.

In 2009, during his first year in office, Najib Razak announced in a Reuters interview his intention to "offer "credible" cuts in [Malaysia's] emissions of carbon dioxide at the Copenhagen climate change summit in a bid to halt global warming"[41]. There he pledged Malaysia to voluntarily reduce its emissions intensity of gross domestic product (GDP) by up to 40% by 2020 based on 2005 levels. This would be conditional on technology transfer and financial support from developed countries[42].

Subsequent Prime Ministers Dr Mahathir Mohamad and Muhyiddin Yassin took office amidst major political shifts and the 1MDB and COVID-19 crises respectively. They did not take any significant international positions on climate change[43].

The next Prime Minister, Ismail Sabri, announced the goal of Malaysia becoming 'carbon neutral' earliest by 2050 when he tabled the 12th Malaysia Plan in September 2021, one month after taking office[44]. The 12th Malaysia Plan defines carbon neutral as: "The balance between emitting carbon and absorbing carbon from the atmosphere in carbon sinks"[45]. The Prime Minister also committed to introducing carbon pricing and a carbon tax, as well as to not build new coal-fired power plants[46].

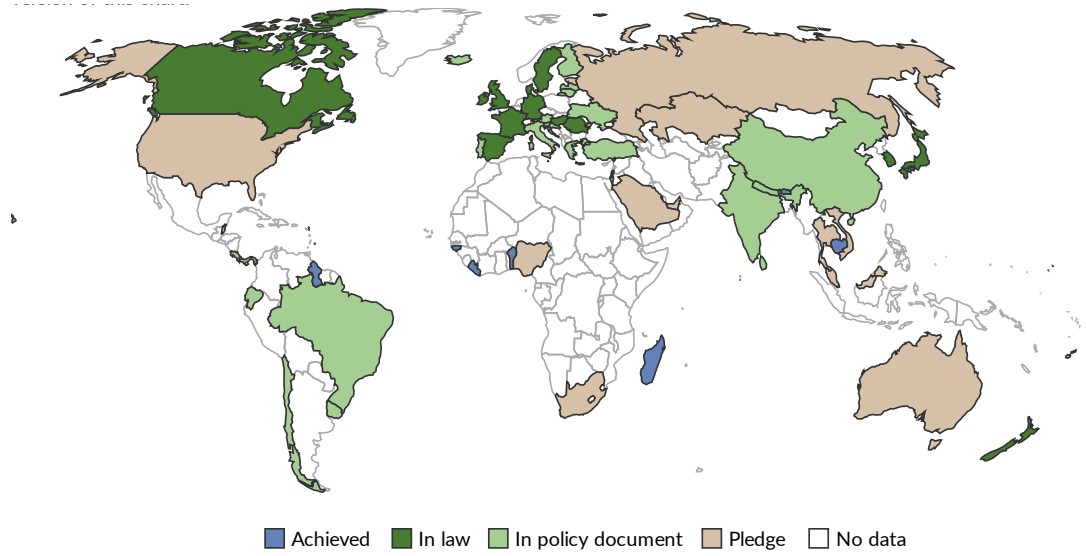
Two months later in November 2021, Malaysia went to the Glasgow climate conference held under the auspices of the United Nations. In Glasgow, a commitment was made to achieve "net-zero" greenhouse gas emissions at the earliest by 2050. While the carbon neutral policy was a commitment to manage emissions of one gas, CO_2, the net-zero target commits Malaysia to

[40] Reuters (2022b)
[41] Reuters (2009)
[42] Ministry of Natural Resources and Environment (2015)
[43] Due to the COVID-19 pandemic there was no UN climate conference held in 2020 whilst Muhyiddin was premier. COP26 was instead pushed back to 2021.
[44] Ismail (2021)
[45] EPU (2021)
[46] Ismail (2021)

balance emissions of seven greenhouse gases, including methane, against their removals from the atmosphere.

By doing so, Malaysia joined a relatively small number of countries that have made a net-zero commitment (see Figure 3). Most countries with net-zero targets are developed economies with a relatively high national contribution to climate change, as well as favourable financial and technological capabilities. A few net-zero countries, such as Madagascar, are extremely poor and consequently have negligible net greenhouse gas emissions, so they have achieved 'net-zero' well ahead of the rest of the world.

Figure 3: Countries with net-zero emissions targets



Source: Our World in Data (2021)

Madagascar is in its third year of a drought-induced famine. It is a reminder that net-zero is not equivalent to climate resilience, especially when governance and poverty appear to be significant factors shaping the famine[47].

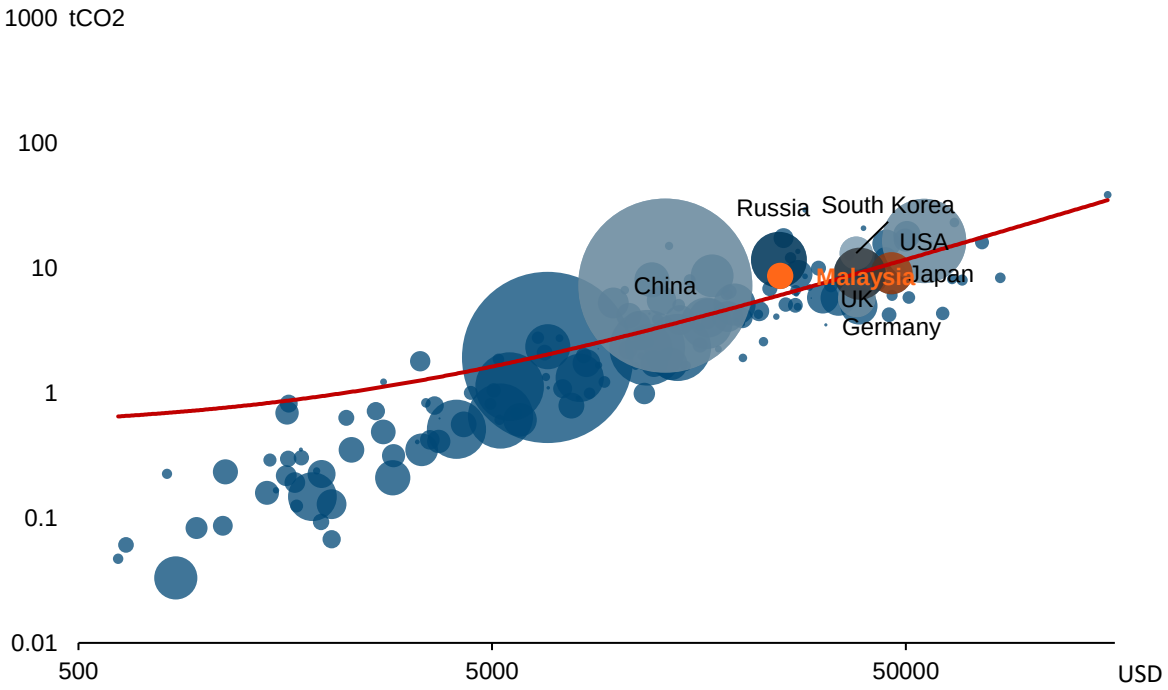
High gross domestic product (GDP) is strongly correlated with high greenhouse gas emissions (see Figure 4). Similarly, de-linking emissions growth from GDP growth seems to mostly happen at high levels of the latter (see 8.2 below)[48]. Malaysia is classified as a 'middle income' country according to the World Bank[49].

Malaysia's carbon neutral and net-zero commitments have also been bundled with a 12th Malaysia Plan statement that "[m]ore private sector companies will be encouraged to declare their aspiration to achieve net-zero carbon emissions by 2050"[50]. Note here that the target date

[47] Financial Times (2022); World Weather Attribution (2021)
[48] Hubacek (2021)
[49] World Bank (2022)
[50] EPU (2021)

encouraged for private sector companies is *by* 2050, whereas the national carbon neutral target has a flexible landing date of *earliest by* 2050. This is challenging for the corporate sector. The development policy question is whether it is *too* challenging.

Figure 4: Annual emissions per capita versus GDP per capita, 2018



Source: Our World in Data (n.d.); KRI/Khoo Wei Yang
Note: Bubble size indicate population size.

Challenges in Reconciling International and Domestic Climate Policy Signalling

Malaysia's commitment to net-zero greenhouse gas emissions has captured attention from domestic companies and climate stakeholders, but it has garnered little recognition overseas.

The desire to boldly step up and be counted alongside the world's largest carbon polluters needs to be weighed against Malaysia's strategic interests, including its aspiration to become a high-income nation amidst increasingly unfavourable global conditions this decade.

There are several points that we should note in regard to high-level climate policy commitments and national strategy:

1. These recent high-level policy commitments by Malaysia strongly emphasise climate change mitigation, i.e. preventing or reducing domestic greenhouse gas emissions. This is an area of climate action in which developed countries are supposed lead in line with their obligations under the United Nations climate treaties (see Section 4 below). Since GDP is positively correlated with emissions, and Malaysia is trying to recover from the pandemic with less fiscal and technological advantages than are available to developed countries,

careful thought should be given the costs of emission reduction measures, and achieving and remaining at net-zero (the two are not the same).

2. Developing countries have to carefully balance their aspirations for sustainable development with available energy resources, finances and technology. Malaysia's commitment to net-zero was made before enabling policies such as a Long-Term Low Emissions Development Strategy (LT-LEDS) and complementary economic diversification strategies could be developed, ideally in consultation with the private sector and other stakeholders. The flexible landing date of "earliest by 2050" may offer sufficient policy flexibility to accommodate unfavourable global and national macro conditions, but it is easily mistaken, even within government, for the firm target date of 2050 that the private sector has[51]. This could harden into policy under diplomatic pressure as developed countries press for greater commitments by the 2024 climate summit.

3. In the absence of a clear implementation plan of how to achieve net-zero by 2050 the private sector as a whole is being left to determine its respective pathways at the firm level, as opposed to industry or sector level. High level policy guidance could include sectoral apportionment of burdens that resolve implementation dilemmas such as:

    a. Do small and medium enterprises (SMEs) have to take steps now or be shielded?
    b. Should emissions-intensive energy-related sectors take a leading role, since they can shift the energy mix for most other users? Or, are there lower cost pathways available?
    c. What should be done with regards to relatively emissions-intensive but economically sensitive sectors such as Malaysian steel which are small in global terms?

4. There has been comparatively less high-level emphasis on the other major aspect of climate policy, climate adaptation. Adaptation is acknowledged in the Malaysia Plan via near-term disaster risk reduction and a national adaptation action plan, originally scheduled for 2022, is now delayed[52].

5. In June 2022, following the December 2021 floods and discussions on a flood management roadmap to increase Malaysia's readiness in facing the impact of climate change, the Prime Minister announced that a National Adaptation Plan (MyNAP) would be developed[53]. Remarks by the Secretary-General of the Environment and Water Ministry suggest that this may happen by 2024 or later[54]. However, there is little stopping Malaysia from accelerating the MyNAP development timeline so that government at all levels, firms and society receive clear policy guidance on how to best take local climate changes into account as early as possible.

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[51] MOF (2021)
[52] Malaysiakini (2021c)
[53] Malaysiakini (2022a)
[54] Malaysiakini (2022b)

6. Climate adaptation discussion is also lacking in the corporate sector, due in part to a lack of advocacy and available localised information[55]. Adaptation within "climate action" is either entirely absent,[56] or an afterthought[57] behind a focus on mitigation and low-carbon emissions, echoing the discourse of companies based in developed countries who have climate treaty obligations to take the lead[58].

[55] Personal communications with the financial sector and companies under the CEO Action Network were conducted in 2022.
[56] CEO Action Network and CGM (2021)
[57] BCG & WWF (2021)
[58] Mandatory guidelines for the financial sector in the form of Bank Negara's version of the G20 Taskforce on Climate-related Financial Disclosures (TCFD) do require assessment of physical risks alongside transition (policy) risks, though reporting of the former is less stringent than the Scope 1, 2 and 3 emissions required as part of the latter. JC3 (2022)

3. National Climate Strategy

3.1. Locating Climate Strategy

Where are we to locate national climate strategy? Climate strategy is currently subsidiary to the national development strategy, which is itself subsidiary to the national grand strategy.

3.2. Grand Strategy

The highest level of national strategy is grand strategy. A "grand strategy describes a nation's most important and enduring interests and its theory for how it will defend or advance them, given domestic and international constraints"[59]. It is not reducible to foreign policy, since it involves how such policy aims are pursued. While strategy derives from the Greek *strategos*, or military general, grand strategy is not confined to military security, particularly for a middle power such as Malaysia. Here, it refers to pursuing long-term sovereignty and sustainable development while managing trade linkages in a geopolitically dynamic Asia-Pacific.

Malaysia once "punched above its weight" from the 1990s to the early 2000s, turning away from its erstwhile colonial master Britain in the 1980s, instead looking East and to South-South cooperation, and playing a more activist role in United Nations' fora[60].

Table 1: Malaysia, Top Export Markets by Destination, 2020-2021 (RM '000)

Rank	Country	2020	2021
1	China	159,222,992	192,474,596
2	Singapore	142,145,579	173,973,855
3	Asean (Excl. Singapore)	130,833,717	169,529,119
4	United States Of America	109,080,342	142,243,703
5	European Union	84,354,966	103,720,634
6	Hong Kong, Sar	68,166,845	76,706,163
7	Japan	62,561,420	75,816,437
8	India	30,403,787	45,202,828
9	Taiwan, Province Of China	33,873,530	40,624,718
10	Korea, Republic Of	34,713,835	38,224,156

Source: DOSM (2022)

Hedging between the United States and China as rival Asia-Pacific powers has long been a core feature of Malaysia's grand strategy[61]. This has only intensified as Malaysia shifted its economic ties away from Britain and increased trade and participation in global value chains (GVCs) centred on first the US (and Japan), then China[62]. Engagement with China only intensified after

[59] RAND (n.d.)
[60] Lee (2011); Elina (2019)
[61] Lee (2006); Kuik (2021)
[62] WTO and World Bank (2019)

the latter joined the World Trade Organisation in 2001. China is now Malaysia's largest export market, while the US is fourth after Singapore and the rest of ASEAN (see Table 1).

In light of sustained attempts by the US to curb China's potential to emerge as a pre-eminent hegemonic power, Malaysia's hedging strategy will continue to be useful. However, it could likely require refinements in light of intensified measures by the US, such as restrictions on high performance semiconductor exports to China.[63] This is the point where grand strategy should be informed by national development strategy to maximise economic outcomes for the nation as external conditions shift.

3.3. National Development Strategy

Indonesia under Jokowi's first term had a grand strategy to become a global maritime fulcrum. This expansive ambition was quietly abandoned by his second term, replaced with a greater focus on domestic economic and infrastructural development[64]. It is now renegotiating the relationship between foreign capital and its domestic natural resources. Whereas under Suharto, multinational extractive industries could export the country's mineral wealth in exchange for minimal industrial spillover, Indonesia today is leveraging its privileged access to precious minerals such as nickel (important for lithium-ion batteries used in electric vehicles) to negotiate with foreign capital for vertically-integrated supply chains concentrated in Indonesia in partnership with Indonesian state-owned enterprises[65]. This implies more industrial upgrading and value-added captured by the Indonesian economy and a means to profit off energy transition in other economies.

Malaysia's national development policies are exemplified by the medium-term five-year Malaysia Plans and long-term plans (such as the Industrial Master Plans, the National Energy Policy). The Malaysia Plans have been characterised by a long-running concern with redressing socioeconomic inequality and long-term structural transformation of the economy from a post-colonial primary commodity producer to a more diversified producer of manufactured goods and value-added resource-based industries[66].

Malaysia's Development Has Been Successful but Challenges Remain

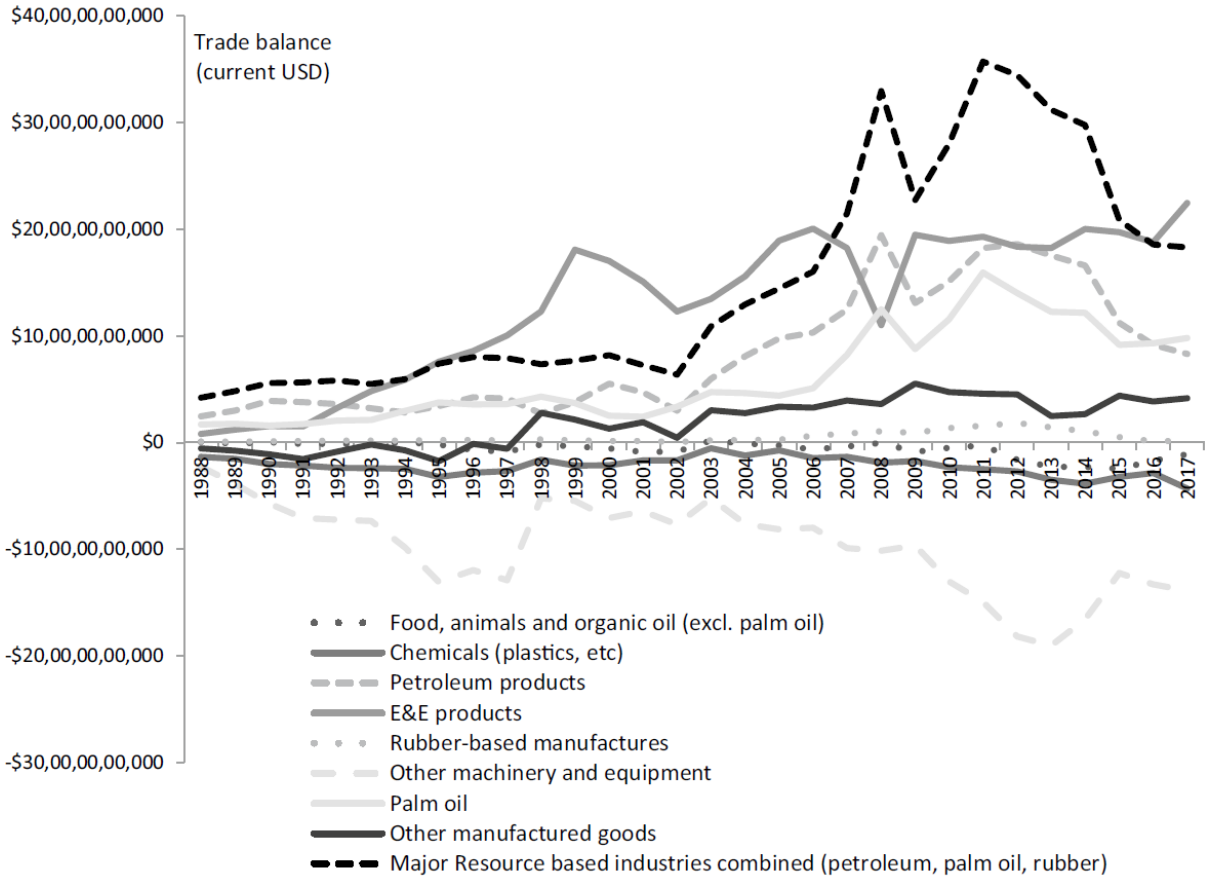
The growth of export-oriented manufacturing while stellar has not been without complications. The electrical and electronics (E&E) goods sector, including semiconductors, have come to be seen as the jewel in Malaysia's exports, with a 39% share of total exports in 2020[67]. However, Malaysia has found it challenging to establish stronger local firm presence in the sector. Electronics was the manufacturing sub-sector most dependent on foreign direct investment (FDI). From the 1990s until the mid-2000s, more than half of FDIs were concentrated in the

[63] Agrawal, Ravi (2022)
[64] Laksmana (2019)
[65] Huber (2021)
[66] Lafaye de Micheaux (2017); Lebdioui, et al. (2021)
[67] MATRADE (2021)

electronics sector. Sovereign wealth fund Khazanah Nasional reportedly sank upwards of RM2 billion into the development of local chipmaker Silterra before profitability losses and challenges moving up the technology curve led to divestment[68].

FDI is often used as a shorthand for external economic confidence and national economic success. However, the electronics industry "relied on imports of capital goods, raw materials and intermediate consumption for quantitites close to those of exported volumes"[69]. This technological dependence was linked to the import of high-technology inputs and the weakness of local suppliers. The former were often imported from subsidiaries of the same multinational based in Singapore, Japan, the US or China[70].

Figure 5: Malaysia: trade balance by sector,1988 - 2017



Source: Lebdioui, et al. (2021)

This has led other scholars to look beyond the surface success of the electronics sector to appreciate how resource-based sectors such as petroleum, rubber and palm oil have had stronger

[68] The Star (2020)
[69] Lafaye de Micheaux (2017)
[70] Lafaye de Micheaux (2017)

positive effects on Malaysia's trade balance compared to E&E products (see Figure 5)[71]. E&E contributions to trade surplus have been relatively stagnant since 2000.

Two trade-related emerging challenges for Malaysia's national development strategy are first, how emissions-reducing technologies may rest on technology-intensive goods imported from developed countries over which they hold intellectual property rights[72]. Second, Malaysia's successful resource-based sectors may fall foul of developed country attempts to impose trade restrictions on carbon-intensive exports, such as the EU's carbon border adjustment mechanism.

While optimism and ambition are important in economic development it is important for climate-related transition advocates not to overestimate the ease of structural transformation and economic diversification. Industrial policy is a challenging endeavour much prone to failure as part of learning processes[73]. Climate strategy should aim to maximise policy flexibility and extract maximum resources for transition.

3.4. National Climate Strategy

Malaysia's climate policy is incorporated under the Malaysia Plans. It is comprised of several policies and roadmaps, many of which are under development as of 2022 (see below). The National Climate Policy 2009 is undergoing revision and an updated version may be released in the near future.

Global climate stabilisation ultimately requires deep, rapid and credible emissions cuts from the largest polluters, who are for the most part developed countries. As we saw in Figure 1 above, just six countries are responsible for over 70% of historical carbon dioxide emissions (as of 2020) compared to Malaysia's 0.37%. If Malaysia shares the UN goal of global climate stabilisation it must recognise that unilateral national action (such as our own net-zero target) is only a very small component of the solution. Sizable emission reduction measures need to come from the sizable emitters. Since they are sovereign countries and Malaysia is only a middle power, getting such constructive behaviour requires diplomacy.

Climate Stabilisation Requires Diplomacy

The United Nations climate process is the principal forum for exerting diplomatic pressure on large polluters, especially since fulfillment of the Paris climate agreement is based on voluntary Nationally Determined Contributions (NDCs). Each country sets their own level of ambition in terms of emissions cuts, climate finance, adaptation measures and so forth. Developed countries typically possess the financial and technological means to deliver deep emissions cuts. Fiscal and technological responses to COVID-19 pandemic have proven how possible, and globally inequitable, this can be.

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[71] Lebdioui, et al. (2021)
[72] Yu (2022)
[73] Stiglitz (2017)

Looking to the future it remains to be seen if Malaysia is able to pressure great powers for accountability, as compared to the 1990s and early 2000s where we "punched above our weight." Our great power allies are those that will require the greatest diplomatic pressure to act rapidly and equitably on climate change. They are also the home countries to the foreign investors we typically court. Referring to Table 1, four out of ten of Malaysia's major export markets are major greenhouse gas emitters.

Hedging and the CPTPP

During the Obama Administration, Malaysia joined negotiations for the Trans-Pacific Partnership (TPP), a US-led multilateral trade and investment liberalisation treaty aimed at consolidating selected Asia-Pacific countries under US influence and draw them away from China. While the primary aim of the TPP was geopolitical, its form was economic. It presented an opportunity for Malaysia to pursue its US-China hedging strategy. At the same time China was being courted for infrastructure investment, particularly in railways. Free trade agreements such as the TPP court controversies with both domestic and foreign stakeholders and they can reallocate wealth and resources within countries and between countries. Obama had to stress environment and labour gains to appease domestic critics concerned about job losses due to tariff changes. In Malaysia concerns were raised, and protests held, about a range of economic impacts that included job losses, foreign ownership and control, and the ability of foreign companies to take Malaysia to private arbitration courts under Investor-State Dispute Settlement (ISDS)[74]. Similar concerns were cited by Obama successor Donald Trump when he withdrew the US from the TPP in 2017. Japan then took over leadership of the TPP grouping, rebranding the agreement as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).

Such domestic concerns help in part explain the delay between the conclusion of negotiations in 2015, and Malaysia signing in 2018, and only ratifying in 2022, seven years later[75].

Coalitions

If Malaysia were to be diplomatically isolated in climate negotiations then it may, for example, find it harder to resist inequitable pressure by developed countries to engage in emission reductions beyond its responsibilities under the convention. Such commitments could conflict with national sustainable development objectives especially if developed countries fail to honour pledges on climate finance, technology transfer or their own emission reductions. Achieving higher level negotiation concessions, such as conditional reductions in exchange for finance, technology or demonstrable developed country progress, could require more diplomatic power than Malaysia possesses on its own.

[74] Jomo (2022); Consumers Association Penang (2022)
[75] MITI (2022)

Fortunately, Malaysia has participated in country coalitions such as the Group of 77 and China, which is a negotiation grouping representing developing countries (and now numbers 134 countries up from the founding 77)[76]. Malaysia was also instrumental in forming a newer grouping, the Like-Minded Developing Countries (LMDC), which brings together emerging, oil-dependent and poor developing countries[77].

International negotiations were famously described by the sociologist Robert Putnam as a "two-level" bargaining game between domestic stakeholders that influence a country's international position, and international pressures, such as negotiation with other countries who need to satisfy their own domestic interests[78].

> The politics of many international negotiations can usefully be conceived as a two-level game. At the national level, domestic groups pursue their interests by pressuring the government to adopt favorable policies, and politicians seek power by constructing coalitions among those groups. At the international level, national governments seek to maximize their own ability to satisfy domestic pressures, while minimizing the adverse consequences of foreign developments. Neither of the two games can be ignored by central decision-makers, so long as their countries remain interdependent, yet sovereign[79].

However, the complexity multiplies:

> Each national political leader appears at both game boards. Across the international table sit his foreign counterparts, and at his elbows sit diplomats and other international advisors. Around the domestic table behind him sit party and parliamentary figures, spokespersons for domestic agencies, representatives of key interest groups, and the leader's own political advisors. The unusual complexity of this two-level game is that moves that are rational for a player at one board (such as raising energy prices, conceding territory, or limiting auto imports) may be impolitic for that same player at the other board. Nevertheless, there are powerful incentives for consistency between the two games. Players (and kibitzers) will tolerate some differences in rhetoric between the two games, but in the end either energy prices rise or they do not[80].

Coalitions allow members to increase their negotiating power and influence by allowing them to pool resources and expertise and to show strength in numbers[81].

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[76] Group of 77 (n.d.)
[77] Castro (2021)
[78] Putnam (1988)
[79] Putnam (1988)
[80] Putnam (1988)
[81] Dupont (1996); Castro (2021)

Components of a National Climate Strategy

In order to properly formulate national climate strategy Malaysia needs to understand and reconcile several factors:

1. International climate laws
2. Malaysia's climate data in comparative context
3. Scientific findings on Malaysia's climate vulnerabilities
4. Existing and emerging climate-related policies
5. Reconciling climate strategy with national development and grand strategy

4. International Climate Laws

There are two principle international climate treaties covering international climate action. These are the 1992 United Nations Framework Convention on Climate Change 1992 and its 2015 Paris Agreement 2015 as well as the relevant decisions of the UN body governing the two. These legal instruments allow pressure on Malaysia for climate action and allow it to pressure others. As a developing country, Malaysia still possesses considerable discretion in how it chooses to act under these treaties.

Non-legal avenues conveying pressure for climate action include demands from domestic actors, and external financial perceptions, such as emerging investment-related and environmental, social and governance (ESG) concerns. The latter in practice are hard to quantify. Do Malaysian firms experience portfolio outflows due to ESG concerns or are outflows associated with regional reallocations of capital due changes in US interest rates, for example? This is a matter for further research.

4.1. The United Nations Framework Convention on Climate Change (UNFCCC)

The 1992 United Nations Framework Convention on Climate Change (UNFCCC) is the highest level international instrument governing action on climate change. It has near-universal membership, with 198 countries that have ratified it. Its highest decision-making body is known as the Conference of the Parties (COP). 2022 saw their 27th meeting, or COP27, in Egypt.

A Clear Goal Linked to Science

The UNFCCC recognises that human interference with the climate has adverse effects, and something needs to be done. As its "ultimate objective" the Convention aims for a specific goal of "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [human-induced] interference with the climate system" (Article 2)[82].

This is to be achieved within "time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" (Article 2). What constitutes "dangerous anthropogenic interference" is explained by the scientific reports of the Intergovernmental Panel on Climate Change (IPCC).

Equitable Burden Sharing

Since "the largest share of historical and current global emissions of greenhouse gases has originated in developed countries" (Preamble), the Convention puts the responsibility on developed countries to "take the lead in combating climate change and the adverse effects

[82] United Nations (1992)

thereof" (Article 3). The developed countries are set out in Annex I of the Convention. These are sometimes referred to as the "Annex I countries" (see Table 2).

Table 2: Annex I Parties to the UNFCCC

Australia	Austria
Belarus	Belgium
Bulgaria	Canada
Czechoslovakia	Denmark
European Economic Community	Estonia
Finland	France
Germany	Greece
Hungary	Iceland
Ireland	Italy
Japan	Latvia
Lithuania	Luxembourg
Netherlands	New Zealand
Norway	Poland
Portugal	Romania
Russian Federation	Spain
Sweden	Switzerland
Turkey	Ukraine
United Kingdom of Great Britain and Northern Ireland	United States of America

Source: UNFCCC (1992)

Article 3(1) sets out an important principle of distributive justice known as "common but differentiated responsibilities":

> The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their *common but differentiated responsibilities and respective capabilities*. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

This principle is important to ensure that those with least responsibility for climate change are not shouldered with disproportionate burdens. This is spelled out in Article 3(2):

> The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.

Developed Countries To Take the Lead

Developed countries under Annex I take the lead by limiting their anthropogenic emissions of greenhouse gases", "protecting and enhancing greenhouse gas sinks and reservoirs" (that absorb GHGs) (Article 4(2)a).

A wealthier subset of Annex I countries called Annex II made commitments to "provide new and additional financial resources" to help developing country Parties in implementing the Convention (Article 4(3)). They also agreed to provide financial resources for technology transfer to developing countries, as well as to assist developing countries that are particularly vulnerable to climate change in meeting costs of adaptation (Article 4(4)).

Table 3: Annex II Parties to the UNFCCC

Australia	Austria
Belgium	Canada
Denmark	European Economic Community
Finland	France
Germany	Greece
Iceland	Ireland
Italy	Japan
Luxembourg	Netherlands
New Zealand	Norway
Portugal	Spain
Sweden	Switzerland
Turkey	United Kingdom of Great Britain and Northern Ireland
United States of America	

Source: UNFCCC (1992)

Furthermore, Annex II countries committed to:

> take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and knowhow to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties (Article 4(5)).

It is worth noting that these commitments are not automatically fulfilled or honoured, especially in relation to finance and technology transfer. This is where diplomatic pressure and accountability play a critical role, in particular participation in coalitions of interest.

Developing Countries Have Special Considerations for Economic Development

The UNFCCC recognises that the impacts of climate change and measures taken by developed countries to meet their obligations under the Convention could have detrimental impacts on developing countries.

Absent protections, fossil-fuelled industrialisation would be a privilege only for those developed countries that had profited from it. Developed countries could 'resolve' the climate change problem in a wholly inequitable way by restricting developing countries from using fossil fuels. Given that GDP is correlated with GHG emissions, developing countries without alternatives to fossil fuels would be trapped in poverty. Restricting access to environmentally sustainable energy

technologies (such as via pricing, intellectual property rights, or trade restrictions) and penalising the use of fossil fuels (such as externally imposed carbon pricing) would effectively kick away the ladder of development. Such selective victimisation has long been a concern of highly populated industrialising developing countries such as India and China[83].

A less extreme scenario could involve developing countries being forced to make difficult trade offs between economic development and contributing to the climate crisis under tight financial and technological constraints. This would add to the difficulty a number of middle-income countries already face in graduating to higher-income status[84].

In order to mitigate against such outcomes the Convention has Article 3 Principlesm that sets out the "common but differentiated responsibilities" (3(1)) and consideration for developing countries that would have to bear a "disproportionate or abnormal burden" (3(2)).

Furthermore,

> Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change (Article 3(4)).

In light of ongoing efforts by the European Union to impose a Carbon Border Adjustment Mechanism (in effect a carbon tariff on imports) it should be noted that Article 3(5) states that:

> Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade (Article 3(5)).

Provisions for Developing Countries with Special Geographical and Economic Vulnerabilities

Of relevance to Malaysia are provisions in Article 4(8) for actions such as funding, insurance and technology transfer to meet the needs and concerns of developing countries arising from the adverse effects of climate change and/or the impact of response measures on countries with low-lying coastal areas, forest areas, areas prone to natural disasters, fragile ecosystems and countries whose economies are highly dependent on income generated from fossil fuels.

It is worthwhile noting here some points on recent dynamics of Malaysia's fiscal dependency on fossil fuel revenue.

In Malaysia's proposed Budget 2023, dividend payments from the national oil company PETRONAS are expected to contribute RM35 billion, or over 9.4% of the estimated RM372 billion

[83] Agarwal and Narain (1991)
[84] Chang (2002); Lebdioui, et al. (2021)

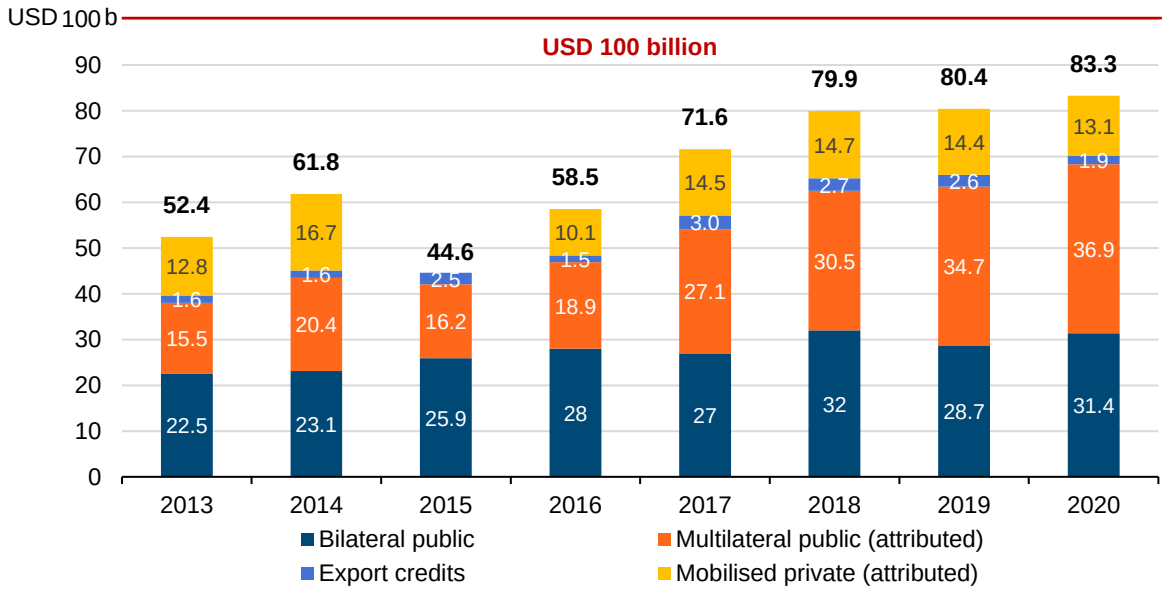
budget, which is 26.6% funded by debt. The 2022 dividend of RM50 billion funded 13% of the revised Budget 2022, which is 25.6% debt funded[85].

During the second year of the COVID-19 pandemic, the Malaysian government paid for its national vaccination programme with RM6 billion ringgit drawn from one of Malaysia's sovereign wealth funds, the National Trust Fund (Kumpulan Wang Amanah Negara, KWAN). KWAN is primarily funded by contributions from PETRONAS. In addition to the RM35 billion contribution to the 2023 Budget, PETRONAS has also committed to replenish KWAN with RM2 billion[86].

Conditionality and the Priority of Socioeconomic Development

Under Article 4(7) an element of conditionality is provided for that makes the extent of developed country commitments dependent on the effective implementation of financial and technology transfer commitments by developed countries. Developing country implementation "will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties".

Figure 6: Climate finance shortfalls by developed countries, 2013 - 2020



Source: OECD (2022)

Unfortunately, developed country targets to deliver $100 billion in climate finance to developing countries have been missed for years (see Figure 6)[87]. Climate finance is also skewed towards mitigation, reflecting the priorities and concerns of developed countries. An OECD review of

[85] The Edge (2022)
[86] The Edge (2022)
[87] OECD (2022)

climate finance flows in 2020 found that climate finance was skewed towards mitigation (58%) while adaption was only 34%. Cross-cutting activities comprised 7%[88].

Notably, in 2021 Malaysia dropped finance and technology transfer conditionality in its revised greenhouse gas emissions intensity target submitted before COP26[89].

Climate Justice

The UNFCCC is an important manifestation of climate justice. It upholds three principles: *distributive justice* which refers to the allocation of burdens and benefits among individuals, nations and between generations; *procedural justice* which refers to who decides and participates in decision-making; and, *recognition* which entails basic respect and robust engagement with and fair consideration of diverse cultures and perspectives[90]. Climate justice is very important when translating climate action to the national level as it enables more inclusive outcomes.

4.2. The Paris Agreement

The UNFCCC set out principles and modalities for action, but it did not have targets. The Kyoto Protocol was developed in 1997 as the first legally binding treaty under the UNFCCC. It required developed countries to reduce emissions by an average of 5 percent below 1990 levels. There was unhappiness among developed countries that developing countries did not have emission reduction targets. There was also unhappiness that the 'flexible market mechanisms' of the Kyoto Protocol gave developed countries too much leeway to avoid engaging in substantial domestic emission reductions. The US signed, but never ratified the Protocol and left it in 2001[91].

Following the failure of the Kyoto Protocol to deliver credible emission reductions by Annex I countries, another method was attempted, "substantially eroding" the Convention's differentiation of Annex I (developed) and non-Annex I (developing) countries[92].

Specific Temperature Targets

Significantly, the Paris Agreement established specific temperature targets. Namely, to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and ideally to limit it to 1.5°C above pre-industrial levels (Article 2(1)a) by the second half of the 21st century (Article 4(1)). Ongoing scientific work by the IPCC establishes the substantial qualitative and quantitative differences between these two temperature targets.

[88] OECD (2022)
[89] KASA (2021)
[90] IPCC (2022b)
[91] Maizland (2022)
[92] Castro (2021)

Voluntary National Commitments with Equity

Breaking with the Annex I/non-Annex I framework of the 1992 Convention, the 2015 Paris Agreement requires all countries to set emissions reduction commitments via Nationally Determined Contributions (NDCs). These voluntary self-determined commitments would be progressive (i.e. a ratchet mechanism). Albeit, commitments would reflect the principle of common but differentiated responsibilities (Article 4(3), 4(11)), that reflect "different national circumstances (Article 2(2)). Thus, developed countries should still take the lead (Preamble).

In practice however, there is nothing stopping developing countries from taking on or being pressured to take on emission reductions in excess of the principle of common but differentiated responsibilities. Thus, the distributive justice dimension of the Paris Agreement is weaker than that set out in its parent Convention. It is up to individual developing countries to establish the boundary of their obligations.

The Paris Agreement furthermore recognises that "peaking [emissions] will take longer for developing country Parties" and that "a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century" should be achieved "on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty" (Article 4(1)).

A System of International Peer Pressure

NDCs may take the form of an emissions reduction percentage by a target date relative to a baseline year. Alternately, they can be a carbon neutral or net-zero emissions target. There is little standardisation or robustness in these targets at present. Developing countries have also detailed specific actions they will undertake such as reforesting land (Chile), promoting renewable energy (China), or both (India).

Regular global stocktakes under Article 14 are intended to stimulate ambition and ensure that national emission pathways gradually converge to a global state consistent with achieving the target temperature of the agreement (Article 2).

Beyond emission reductions, Article 7 of the Paris Agreement establishes a global goal on adaptation that is adequate to the temperature goals. Adaptation efforts can form part of a country's NDC. Other NDC-related measures include: the provision of finance by developed countries to developing countries for both mitigation and adaptation (Article 9); technology transfer (Article 10); capacity-building (Article 11); and transparency of information (Article 13). Outside the scope of NDCs is addressing the issue of loss and damage from climate impacts (Article 8).

The Paris Agreement and its NDCs effectively establish a 'peer pressure' mechanism where the commitments and progress of each country can be scrutinised by other countries as well as a range of domestic and international stakeholders. Developed country commitments on emission reductions, finance and technology transfer can be held to account by developing countries. Likewise, developed countries wishing to pressure some or all developing countries to make improved commitments can attempt to do so. Inequalities of power, finance and influence can make this process asymmetrical.

Provisions concerning equity, differing national circumstances, common but differentiated responsibilities and sustainable development help establish a framework to increase the comfort for negotiations between countries of wildly disparate power levels and wealth. Developing countries have little individual power compared to Great Powers. Coalitions help improve their bargaining position. Coalitions mobilising the weight of numbers resting on equity provisions could in theory leverage constructive behaviour and the sharing of critical resources from developed countries. However, as the past behaviour of the US and Canada shows, developed countries can and do leave international climate legal frameworks when particular governments feel it does not suit their interests.

While the Paris Agreement could eventually fall apart as the Kyoto Protocol did, the re-entry of the US under Biden restores some credibility to the process with the participation of the world's largest emitter. However, in negotiating the Paris Agreement, the Obama Administration desired to avoid needing Senate ratification. Thus, there is no legally binding requirement to actually achieve the goals set in an NDC, nor are there legal sanctions for failing to meet a target[93].

Progress on achieving the Paris Agreement's temperature goals requires trust, transparency and flexibility[94]. A more critical view has been advanced by Sachs (2019):

> The nonbinding nature of NDCs has several consequences that make the Paris Agreement fragile and prone to defections. States cannot compel other states to submit an ambitious NDC or punish states for falling short. There is nothing in the Agreement, moreover, that requires a party to justify its NDC in relationship to reaching the treaty's overall two-degree goal. No provision requires a party to show, for example, that its pledge, in coordination with other nations making a similar level of effort, would achieve this temperature goal. The treaty allows governments to set pledges solely on the basis of domestic convenience and capability[95].

Internal Coordination of Government

However, governments that lack strong internal coordination, particularly in developing countries, could set NDC pledges on the basis of imperfect information and insufficient reconciliation with national development strategy. In practice, climate change concerns overlap several ministries, all of which can have their two-level interactions with both domestic and international actors.

The Ministry of Environment and Water (KASA) is the lead ministry on climate change and represents Malaysia at the UNFCCC, except in cases where the Prime Minister decides to lead the delegation or attend a high-level segment. The Ministry of Finance (MOF) interacts with peer treasuries and international financial institutions through fora such as the Coalition of Finance Ministers for Climate Action (CFMCA), whose Helsinki principles include a commitment to support carbon pricing. The appropriateness of carbon pricing in the Malaysian development

[93] Sachs (2019)
[94] Sachs (2019)
[95] Sachs (2019)

context should be carefully conisdered. The Energy and Natural Resources Ministry (KETSA) is also affected by climate-related decisions regarding forests and the energy sector, such as the Global Methane Pledge and Global Forests Pledge made at COP26 Glasgow.

Why the Paris Agreement Matters

The Paris Agreement is now the primary mechanism for collective international action on climate change. It is therefore currently Malaysia's best mechanism for ensuring that deep, rapid and credible cuts in emissions are delivered by the world's largest emitters. This is in order to achieve the best possible chance at climate stabilisation for Malaysia's climate security.

What should be Malaysia's priorities when it comes to setting NDCs? Should emission reductions come first, or adaptation, financing, technology transfer, capacity building, or pursuing claims on loss and damage?

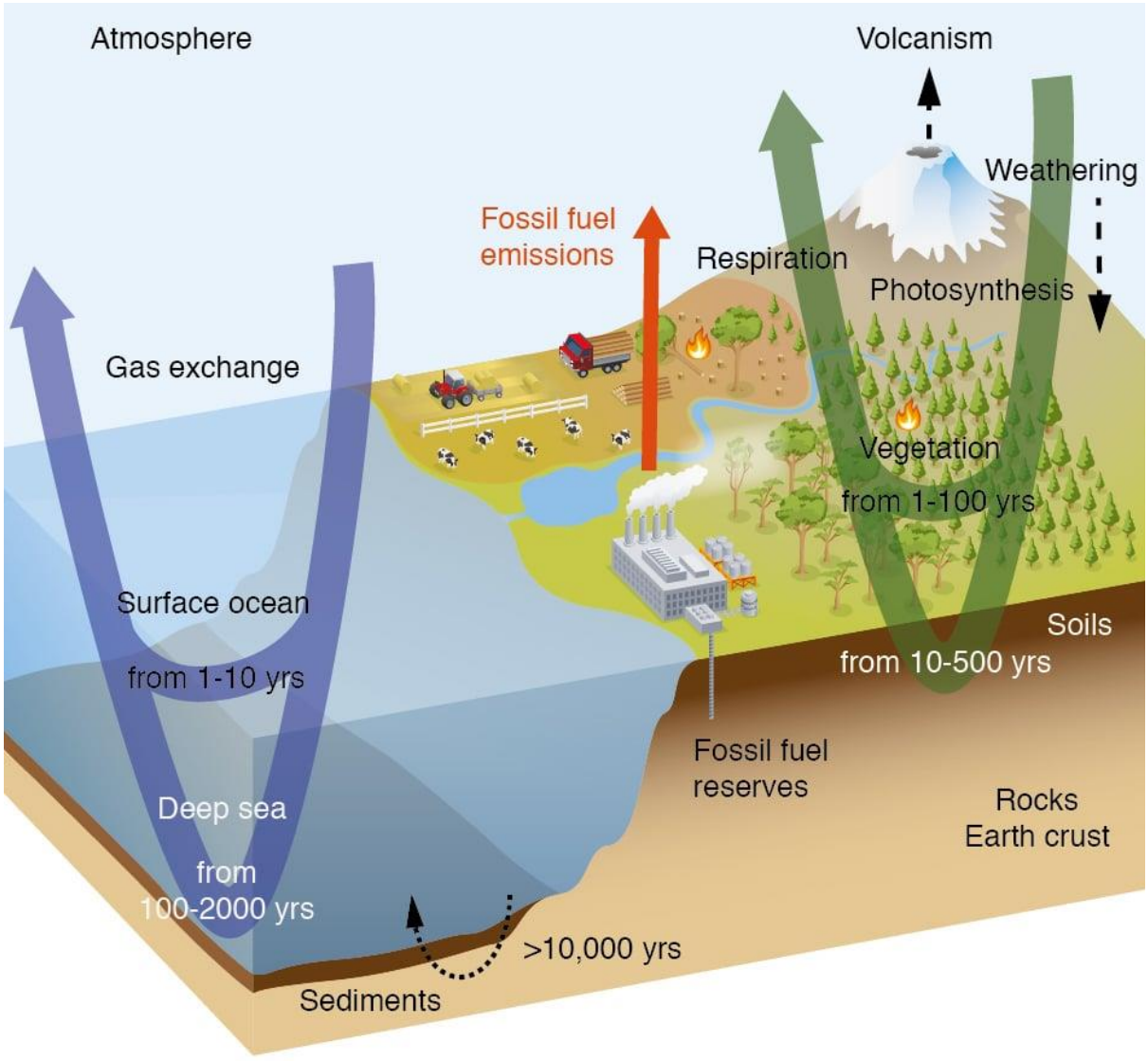
Malaysia's first concern with regards to NDCs should be to interrogate the robustness of NDCs put forwards by the biggest emitters. It should not restrict its scope of climate action to management of its own NDC. This is insufficient for climate stabilisation due to Malaysia's small global contribution. A national "net-zero" target is thus the least consequential focus of Malaysian climate action.

National climate action should be based on understanding comparative climate data (where we stand relative to other emitters), Malaysia's climate vulnerabilities, as well as its development ambitions, capabilities and challenges. Careful consideration of these complex factors will be important in establishing an effective strategy towards setting initial and subsequent NDCs to manage obligations, expectations and perception related to Malaysia's national climate action.

5. Malaysia's Climate Data

Cumulative carbon dioxide emissions matter because it is the principal greenhouse gas and it persists in the atmosphere for hundreds to thousands of years depending on whether it is interacting with land or oceans (see Figure 7)[96]. There is a lag between CO_2 emissions and observed global heating. Changes in emissions can take decades for their effects to be felt.

Figure 7: Carbon and other biogeochemical cycles



Source: IPCC (2018)

[96] Total anthropogenic warming is a function of a range of other greenhouse gases besides CO_2. These have different efficacies and lifetimes of influence on the climate, and are generally shorter lived than CO_2. Their warming effect is better tracked by present-day emissions. Comparison of national communications to the UNFCCC suggests that Malaysia's emissions of gases such as methane were less than 4% of US methane emissions in 2016. Malaysis joined the Global Methane Pledge in Glasgow COP26 in 2021.

Malaysia's cumulative emissions of anthropogenic carbon dioxide stand at 0.37% of global emissions (see Figure 2)[97].

Malaysia's cumulative emissions are comparable to Egypt, Uzbekistan, Pakistan and North Korea (see Table 4). These can be considered our 'emissions peer group'. In economic development terms, Malaysia has been remarkably 'emissions efficient' achieving a GNI per capita of US$10,930 (2021), more than three times that of our nearest emissions peer, Egypt.

Table 4: Malaysia's emission peers and emission reduction commitments as of COP26 (2021)

Country	Cumulative CO_2 Emissions, GT CO_2 (2020)	% of Cumulative Global Emissions (until 2020)	COP26 Commitments (2021)	Net-Zero/Carbon Neutrality Goals	GNI per capita, Current US$ (2021) (World Bank)
Egypt	6.3	0.37%	Updated NDC not submitted	No goals	$3,510
Uzbekistan	6.3	0.37%	Reduce 35% GHG emissions by 2030 (per GDP unit)	Carbon Neutral by 2050	$1,960
Malaysia	6.1	0.37%	Reduce 45% GHG emission intensity by 2030 (unconditional)	Net-zero GHG earliest by 2050 & Carbon Neutral earliest by 2050	$10,930
Pakistan	5.2	0.30%	Reduce 50% GHG emissions by 2030 (15% unconditional + 35% conditional)	No goals	$1,500
North Korea	5.0	0.30%	Reduce 16.4% GHG emissions by 2030	No goals	-

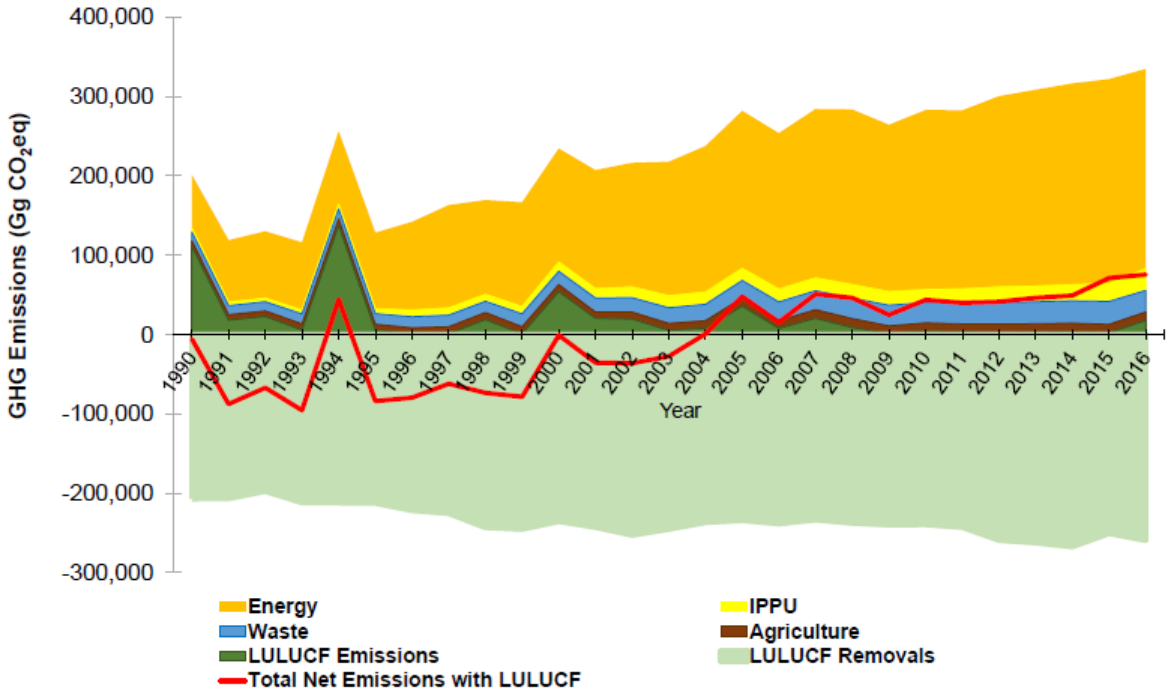
Sources: Global Carbon Project (2021); United Nations (2022); World Bank (2022); Khazanah Research Institute/Chanel Ng

Taking into account available official data on Malaysia's net emissions we observe that Malaysia's emission have been net negative for 11 out of 27 years from 1990 to 2016, the last year for which official data is available (see Figure 8)[98]. Malaysia was last net-zero in 2004. While emission increases have been driven mostly by the consumption of energy, on the other hand sinks and

[97] This is not the net value as long-term historical data for carbon sinks and removals is hard to establish for all countries.
[98] KASA (2020)

removals (land use, land use change and forestry or LULUCF) have grown since 1990, though not enough to equal emissions.

Figure 8: Malaysia, Emissions time series from 1990–2016



Note: Net emissions in red. Malaysia was last net-zero in 2004.
Source: KASA (2020)

In 2016, sinks absorbed over three quarters or 76% of Malaysia's emissions. Malaysia's endowment of carbon sinks is substantial. They compensate significantly for Malaysia's reliance on fossil fuels in its energy mix. In 2016, fossil gas comprised the largest portion of total primary energy supply at 41%, crude oil and petroleum products were 31%, coal was 19% and renewables (including hydro) were 5%[99].

Substantial reductions in our sinks, such as via deforestation or sale to other countries to use as carbon credits, would increase Malaysia's challenge to meet its net-zero target. This could require greater investment in energy transition or less emissions-intensive technologies alongside meeting other economic development imperatives. As a developing country, Malaysia would undertake energy transition with far less fiscal and intellectual property endowments than developed countries currently possess. Interest in carbon credit schemes as "forests for forex (foreign exchange)" need to be balanced against achieving national mitigation targets and preserving national development space.

Sinks can be considered a strategic development reserve for Malaysia. They relieve us of the burden to make the kinds of aggressive and costly investments developed countries would need

[99] EPU (2022)

to do given their greater emissions and the much lower extent of sinks in those countries (through historical deforestation, etc.).

Conservation thus deserves greater development policy attention than it currently gets, particularly with regards to how carbon sinks are valued and protected from land conversion. This includes exploring what are now called "nature-based solutions" – biodiversity-based protection, restoration and sustainable management of native ecosystems[100]. However, the integrity and credibility of such solutions needs to be high to ensure that they do not end up supporting biological approaches, such as exotic tree species plantations in naturally treeless habitats that have negative outcomes for carbon storage, biodiversity and local peoples[101].

Table 5: Malaysia and United States, comparative cumulative (1751-2020) and 2016 emissions

Country	Cumulative CO_2 Emissions, GT CO_2 (2020)	% of Cumulative Global Emissions (until 2020)	Total Annual Emissions, GT CO_2 (2016)	Total Annual Removals by Sinks/LULUCF, GT CO_2 (2016)	Sinks as % of Emissions	Net Emissions, GT CO_2 (2016)
Malaysia	6.1	0.37	0.32	(0.24)	76.17	0.07
United States	417	25.21	6.49	(0.72)	10.78	5.78

Note: 2016 reflects available last comparable data. Totals may not sum due to independent rounding.
Sources: Malaysia (2020); United States (2019)

For comparison, the United States has sinks which absorbed three times as much as Malaysia's in absolute terms in 2016 (see Table 5). However, its annual emissions dwarf Malaysia's. Whereby in 2016, US sinks only absorbed 11% of US emissions compared to 76% absorbed by Malaysia's sinks. Sinks are not easily expanded so the available strategies for a country such as the US are to either purchase offsets from other countries (limited by availability and credibility of such measures) or align emissions reduction and industrial policy as per the emphasis on climate change in Biden's "Build Back Better" plan[102].

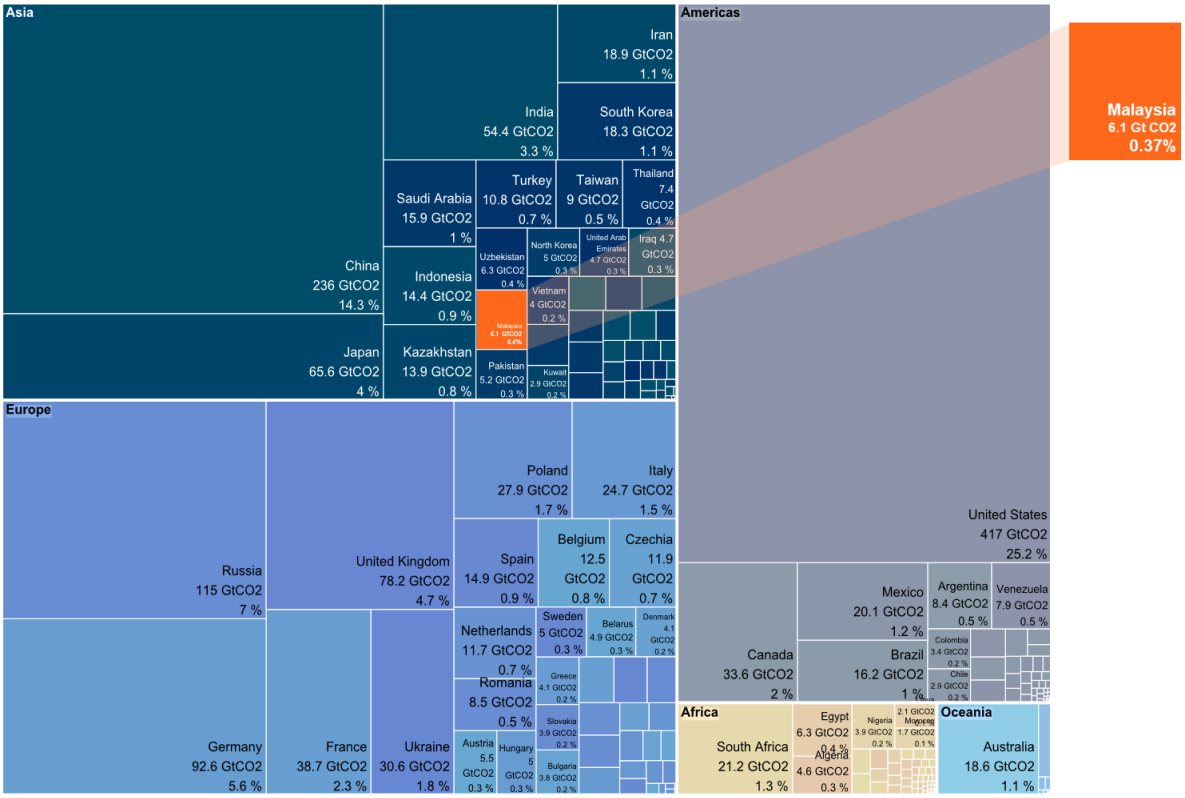
Climate Data in Context

How does Malaysia integrate climate data into efforts to fulfill its commitments under the UNFCCC and Paris Agreement to take common but differentiated responsibility for climate change?

[100] Fankhauser, et al. (2022)
[101] Fankhauser, et al. (2022)
[102] White House (2021)

The decision of any given nation or firm to undertake any given climate action should start with a consideration of comparative climate data. Emission reduction measures taken should be proportionate to culpability for global climate change, i.e. cumulative emissions, with consideration of current and future trends. Developing countries also have a right to pursue economic development since the highest levels of GDP are correlated with the ability to reduce emissions[103]. Thus, the UNFCCC recognises that economic development is "essential for adopting measures to address climate change" (Article 3(4)), as well as the elimination of poverty.

Figure 9: World cumulative carbon dioxide emissions by country, 1751 to 2020



Source: Global Carbon Project (2021); KRI/Khoo Wei Yang

For example, countries such as China or India have far smaller contributions (14.3% and 3.3% respectively, see Figure 9) to cumulative anthropogenic CO_2 emissions than the US or EU (25.2% and 16.6% respectively), but they are industrialising rapidly with populations of over 1.4 billion people each versus the combined population of 779 million of the US and EU. So their future trends are of concern, in particular their ability to reach higher levels of economic development and deploy less emissions-intensive technologies.

However, the emissions already in the atmosphere have pushed the world to 1.2°C over the 1850-1900 average[104]. The US and EU have collectively contributed around 42% of cumulative emissions. Given emissions need to peak then rapidly decline to meet the Paris target of 1.5°C

[103] Kasperowicz (2015)
[104] IPCC (2022b)

developing countries thus have to pursue economic development with far less atmospheric space than developed countries did. If developed countries do not more equitably 'share' the atmospheric space they have taken (via economy-wide decarbonisation and removals) then the economic emergence of developing countries will have to be highly emissions efficient or they may push us beyond planetary limits. This is why financial and technological flows are important.

The climate data above highlight how Malaysia's cumulative and present contributions to climate change are at a qualitatively and quantitatively different order to the largest greenhouse gas emitters. The kinds of NDCs and climate action we commit to under the Paris framework should reflect these differences.

The UNFCCC and Paris Agreement are based on the principle of common but differentiated responsibilities. If a country has been a substantial contributor to greenhouse gas emissions then they are responsible for bringing a degree of harm to others. Therefore, they have a moral and legal responsibility to reduce that harm through mitigation, or transfers of finance and technology.

Is Malaysia a Major Contributor to Climate Change?

To what degree is Malaysia contributing to the climate vulnerability of others (i.e., has Malaysia been a major producer of greenhouse gas emissions)?

Malaysia's comparative emissions are small (0.37% of global cumulative emissions) and carbon absorption by sinks is relatively high (76% in 2016). We can conclude that Malaysia is not a major contributor to global climate change. It is worth considering what role domestic emission reductions play in a balanced national climate strategy alongside pursuing reductions from major global emitters.

The next strategic concern to address is how climate vulnerable Malaysia is and will be. This is important for striking a balance between climate mitigation and adaptation in national strategy.

6. Climate Vulnerability

In order to establish the logical basis and scope for Malaysian climate policy we must first address the science and data-based issue of whether Malaysia is climate vulnerable and in what ways. Table 6 summarises some recent findings on Malaysia's climate vulnerabilities.

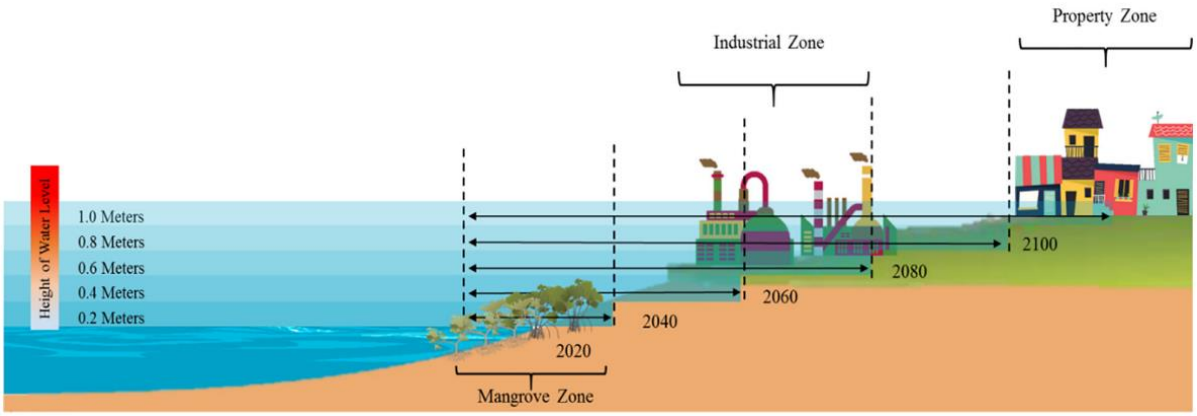
Table 6: Malaysia climate vulnerabilities

Vulnerability	Impacts
Historical Heating	Between 1970 and 2013, Malaysia experienced mean surface temperature increase of 0.14℃-0.25℃ per decade.
Projected Heating	Based on the downscaled IPCC AR5 scenarios, projections of the future changes indicate that the rise of the average annual surface temperature will range from 1.9 to 2.1°C by the end of the century.
Rainfall	The magnitude of change of average annual precipitation is expected to range from 14% to 25%.
Flooding	Malaysia is particularly vulnerable to flooding, which contributes more damage than any other natural hazard. The frequency and extremity of flood events have increased in recent decades. Projections show they will increase with continued climate change. Future flood vulnerability is expected to increase affected population by 70,000 people/year with expected damages of $1.8 billion/year under the highest emissions pathway by 2030. An increased likelihood of flash floods is associated with landslides.
Heat Waves	Frequency and intensity of heat waves is projected to increase significantly, particularly in urban centres. Increased chance of daily max temperatures >33℃.
Coastal	Coastal zones are vulnerable to coastal floods and erosion. 1.6 million coastal zone households in Peninsula in 2009. 17% of total employment is concentrated in coastal areas. Risks to agricultural products in coastal areas from sea level rise is approximately 0.73 meters by the end of the 21st century, with greater sea level rise in Sabah and Sarawak. By 2040, all of Malaysia's mangrove zones could be submerged. By 2060, industrial zones could be affected. Approximately 15% of coastal erosion is threatened by coastal erosion.
Agriculture & Drought	Droughts and floods in the early rice-growing season could reduce yields by up to 60%. Drought conditions may impact the cultivation of rubber, palm oil and cocoa.
Socioeconomic	Climate change is expected to exacerbate poverty and inequality, with low-income earners economically dependent on activities where climatic conditions play a prominent role (agriculture, fishing, informal sectors in urban economy) and typically living in more exposed areas.
Tourism	Coastal states are the most visited outside of KL. Flood risk and coral bleaching may reduce attractiveness of destinations.

Source: KASA (2021); World Bank and ADB (2021); Federal Town and Country Planning Department (2012); Amalina et al. (2018); EPU (2021)

Industrial policy raises the 'roof' of our economy by expanding our economic frontier. Social policies such as pensions and welfare provide a floor under which no one is expected to slip. Agricultural policies help put the right kinds of food on the table. A stable climate is the foundation for this house under which sustainable development is pursued. Climate impacts can negatively impact the achievement of socioeconomic goals and the performance of certain industries. In the worst cases it can inflict physical damage and loss of Malaysia's sovereign territory (via sea level rise, see Figure 10).

Figure 10: Potential impacts of sea level rise over different Malaysian coastal zones



Source: Amalina, et al. (2018)

Risk, Vulnerability, Adaptation, Maladaptation

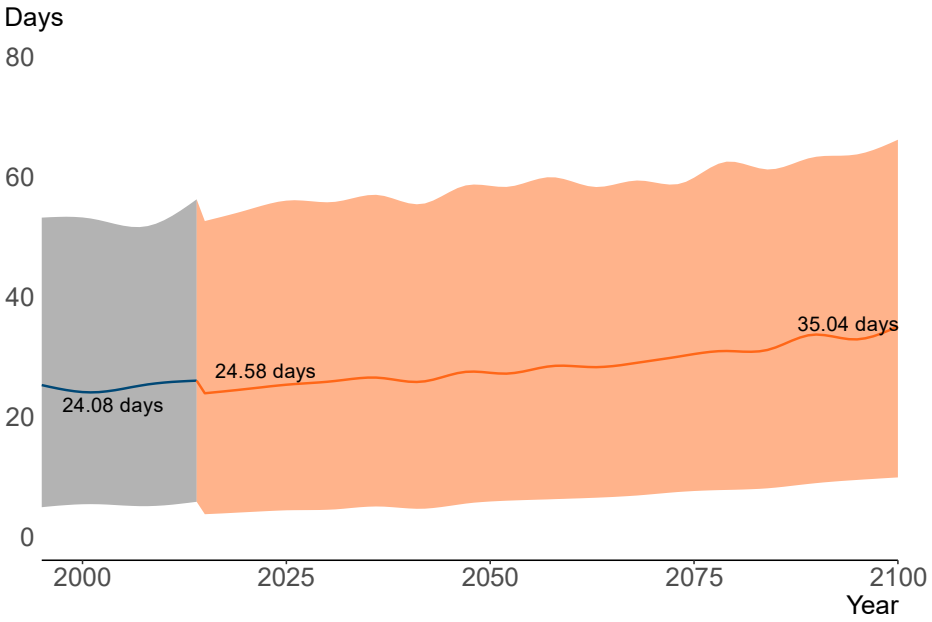
Climate change is increasingly being understood through the lens of risk[105]. Physical risk can arise from the dynamic interaction among climate-related hazards, the exposure and vulnerability of affected human and ecological systems. Human response can also introduce risk.

Vulnerability can differ within communities and across societies, regions and countries, and change through time. Adaptation refers to the adjustment to actual or expected climate and its effects in order to moderate harm or take advantage of beneficial opportunities. Adaptation in ecosystems can occur via ecological and evolutionary processes. For humans, adaptation can be anticipatory or reactive, incremental or transformational. Adaptation has hard and soft limits. The latter refers to scenarios where options may exist but are not currently available[106]. Hard limits to adaptation can be reduced via successful global emissions reduction and stabilisation of the climate system. Maladaptation is possible whereby actions may lead to increased risk of adverse outcomes.

As a coastal tropical country Malaysia has a diverse and complex range of climate vulnerabilities to manage. Rainfall (see Figure 11), which is tied to flash floods and landslides, and heat stress (see Figure 12), are among the significant climate-related threats facing Malaysia. A number of policy responses to these challenges are contained within the 12th Malaysia Plan, though Malaysia has yet to fully prepare policies to respond to long-term climate vulnerabilities. A growing number of countries are preparing such national adaptation plans. Comparative review of these plans should be the subject of further research. Even small island states may have useful lessons for Malaysian adaptation given that our country includes vulnerable islands.

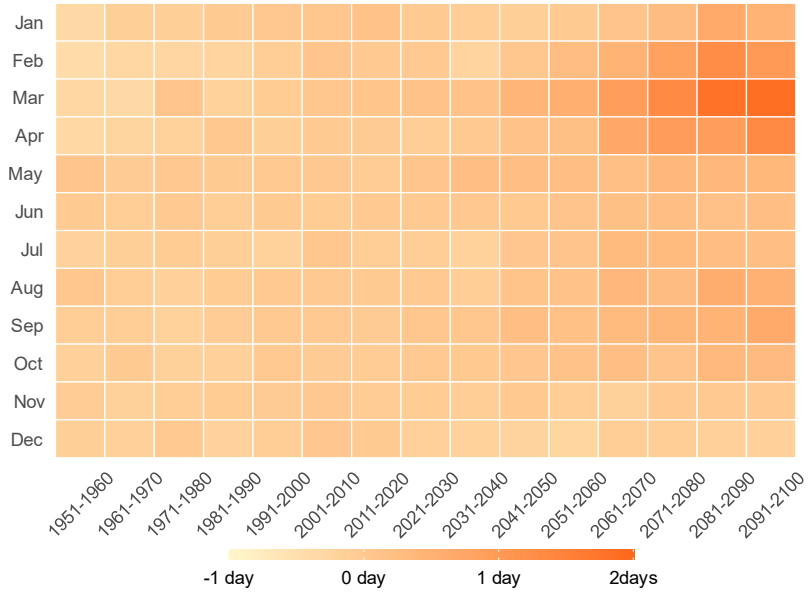
[105] IPCC (2022b)
[106] IPCC (2022b)

Figure 11: Malaysia, projected days with heavy precipitation >20mm², 2000 - 2100



Source: World Bank (2021); KRI author

Figure 12: Malaysia, projected anomalous dry days, 1951 - 2100

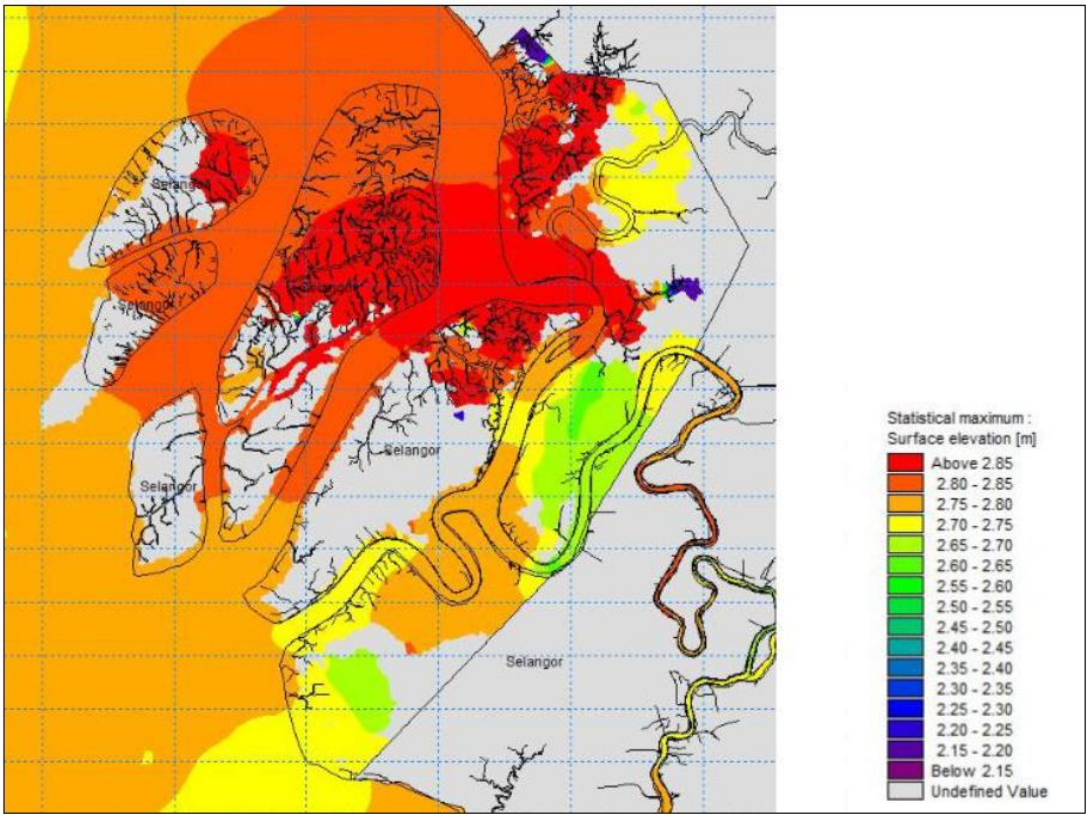


Source: World Bank Climate Knowledge Portal (n.d.); KRI author

Trade Disruption Due to Sea Level Rise

One significant economic impact of sea level rise in Malaysia will be the inundation of its principal maritime port and international trade hub, Port Klang. Projections suggest that much of the port area will be seriously affected by 2060 and completely inundated by 2100. Klang's port facilities are located in the central and upper left red zone in Figure 13 which are projected to experience the highest sea level rise.

Figure 13: Port Klang, projected maximum sea level rise in 2100



Source: Mohamad, et al. (2018)

Climate-resilient Development

Reconciling climate vulnerabilities with economic development will require Malaysia to embrace climate-resilient development. This means implementing climate mitigation and adaptation together in support of sustainable development[107]. This was a focus of the 11th Malaysia Plan[108]. The 11th Malaysia Plan's focus on green growth for sustainability and resilience included strengthening an enabling environment, adopting sustainable production and consumption, conserving natural resources, and strengthening resilience against climate change and natural disasters.

[107] IPCC (2022b)
[108] EPU (2015)

7. Malaysia's Climate Policies Under the 12MP Period

7.1. Government

The tables in this section summarise climate change-related policies that fall under the 12th Malaysia Plan (12MP) period (2021-2025). In addition to existing policies such as the 2009 National Climate Change Policy and the Green Technology Masterplan 2017-2030, they represent the current policy state of Malaysia. Some policies have already been completed as of 2022. Others have been delayed (e.g. MyNAP, LT-LEDS). Table 7 sets out mitigation-related policies. Table 8 sets out adaptation and disaster risk reduction policies.

Table 7: Mitigation-related policies under the 12th Malaysia Plan

Policy/Action	Relevant Parties & Release/ Implementation Date	Notes
Net-zero/carbon neutral	KASA; earliest by 2050	Companies encouraged to achieve by 2050.
Updated NDC	KASA; 2021	Updated NDC submitted for COP26.
Nationally Determined Contribution (NDC) Roadmap	KASA; 2023	Specifies undertakings in fulfilment of Paris Agreement. Not limited to mitigation.
Carbon pricing feasibility study	KASA; Before 2023	Covers carbon taxes, Emissions Trading Scheme. Not a firm commitment to carbon pricing.
Long-Term Low Emissions Development Strategy (LT-LEDS)	KASA; End 2022	Basis for determining Malaysia's net-zero direction and target year.
Voluntary Carbon Market (VCM)	KASA, MOF & Bursa; 2023	First stage before transitioning to the domestic emissions trading scheme (DETS) in 2025.
National Low Carbon Cities Masterplan	KASA + SEDA as lead consultant + under a project funded by the UNDP-GEF; 2021	33 target cities, with the next group to be announced after a five-year term. 15 'Group 1' cities are pushed to achieve a 33% reduction in absolute emissions by 2030, and carbon neutrality by 2050.
Low carbon mobility blueprint for the transport sector	KASA; 2021	Vehicle fuel economy, electric vehicle adoption, alternative fuel adoption, promotion of public transport
National Climate Change Act	KASA; legal framework completed Dec 2021, expected to be finalised in 2025	Little public information. No draft has been shared yet. Unclear if includes emission targets following UK model. Focuses on mitigation measures and governance (institutional framework, formation of a climate change committee).
Establishment of National GHG Centre	KASA; 2030	To increase transparency surrounding emissions data and reporting. A GHG accounting model and database will also be established.

Source: EPU (2021)

Table 8: Adaptation and disaster risk reduction-related policies under the 12th Malaysia Plan

Policy/Action	Relevant Parties & Release/ Implementation Date	Notes
National Adaptation Plan (MyNAP)	KASA; 2024+?	Includes a long-term action plan and strategies for various sectors (public health, infrastructure, water resources and security etc); state governments will be encouraged to adopt the Malaysian Climate Change Adaptation Index.
Climate Change Adaptation Framework for Water Sectors	KASA & NAHRIM; 2022	Guide to developing MyNAP on the water sector. Covers water resources, water utilisation and water-related disasters.
National policy on disaster risk management and multi-level disaster resilience plans	NADMA; ?	Originally planned for release by 2020. As of 2022 no revised date.
Establishment of a multi-hazard data centre and risk register platform	None specified	Iskandar Regional Development Authority has plans for one. Unclear if it will extend to national level.
Promotion of disaster risk financing	None specified	Additional financial resources will be sourced from alternative disaster relief funds contributed by the private sector, CSOs, and individuals. Study on the feasibility of disaster risk transfer mechanisms including disaster risk insurance.
Integrated Flood Management (IFM)	Various govt actors; ongoing	Integrated weather and flood forecasting and early warning system will be expanded to cover more high-risk river basins.
Integrated River Basin Management (IRBM)	DID; ongoing	10 plans were completed by 2019 during the 11th Malaysia Plan and are targeted to all be implemented by 2025.
Integrated Shoreline Management Plan (ISMP)	DID; ongoing	The planning frameworks cover sustainable coastal development + adaptation strategies for every state. Completed in some states, undergoing implementation in others.

Source: EPU (2021)

Malaysia currently has at least ten policies focused on climate mitigation. This is not including measures related to the National Energy Policy 2022-2040 that involve no new coal power plants, moderate increases in renewable energy, an increasing reliance on fossil gas and pursuing a low-carbon economy[109].

[109] EPU (2022)

The only current policy specifically focused on adaptation is the Climate Change Adaptation Framework for Water Sectors[110]. The National Adaptation Plan (MyNAP) was originally planned for 2022 but is now delayed until at least 2024. MyNAP is supposed to address longer-term adaptation. According to Malaysia's 2021 NDC, implementation of climate change adaptation in Malaysia focuses on the management of water resources and security, coastal resources, agriculture and food supply, urban and infrastructure resilience, public health, forestry and biodiversity and key adaptation cross sectoral areas[111].

Since the 11th Malaysia Plan, disaster risk reduction was moved up the agenda to cover nearer-term weather-related disasters alongside the formation of NADMA in 2015[112]. In the Eleventh Malaysia Plan (2016-2020) RM7.24 billion was allocated for implementation to enhance climate-resilience and adaptation measures. The government has also indicated in the NDC that MyNAP will ensure that climate change adaptation is mainstreamed into its development plan[113].

Furthermore, the Paris Agreement requires each Party to monitor, evaluate and learn from adaptation planning, policies, programs, and actions. Malaysia's NDC acknowledges that currently, there is no monitoring and evaluation (M&E) mechanism or framework established for adaptation. An M&E is supposed to be incorporated in MyNAP[114].

The remaining policies in Table 8 address near-term, mostly hydrological, risks. They do not necessarily factor in climate adaptation. Among the significant climate vulnerabilities summarised in Table 6, the issue of heat stress appears to have no dedicated future policy at the moment.

7.2. Central Bank Policy for Financial Institutions

Malaysia's central bank, Bank Negara Malaysia (BNM), has become an active vanguard regulator in propagating climate standards from advanced economies, such as the Group of 20 (G20)[115]. While the G20 includes some developing economies such as Indonesia, it is effectively the G8 plus selected members[116].

The Joint Committee of Three (JC3), which comprises BNM, Bursa Malaysia and the Securities Commission, has issued its version of the G20-derived financial institution reporting guidelines from the Taskforce on Climate-related Financial Disclosures (TCFD)[117]. The guidelines have been

[110] NAHRIM and KASA (2022)
[111] KASA (2021)
[112] EPU (2015)
[113] KASA (2021)
[114] KASA (2021)
[115] BNM (2018)
[116] Tooze (2018)
[117] JC3 (2022)

made mandatory for local financial institutions to comply with by 2024, though it remains unclear what the penalties for non-compliance are.

The TCFD Guidelines offer a detailed and extensive reporting and risk-management framework. These include reporting on transition (policy-related) risk and physical risk. Reporting on clients facing transition risk from climate change does not necessarily entail divestment or restriction of credit, but it could make it difficult for emissions-intensive industries in Malaysia to seek finance. This might be at odds with national development policy and the flexibilities accorded to developing countries under the UNFCCC.

Domestic Context and International Climate Standards

Malaysian industries need to be evaluated in both national and international contexts. For example, the global steel industry accounted for 11% of total global CO2 emissions in 2019[118]. Global crude steel production reached 1,870 million tonnes (Mt) in 2019[119]. Malaysia's crude steel production was 7.04 million tonnes (Mt) in 2019, equivalent to 0.38% of global steel production[120]. Should the Malaysian steel industry be assumed to have the same climate impact and contributions as China's steel industry (53.2% of global production) or even Japan's (5.3% of global production)? Policy measures at the national level in China, India, Japan and US (the top four steel producers in 2019) could move the needle far more for the industry as a whole.

The TCFD Guidelines also include mandatory reporting on Scope 1, 2 and 3 emissions. Scope 1 emissions cover direct emissions from company-owned and controlled resources. Scope 2 cover emissions associated with the purchase of electricity, heating or cooling. Scope 3 emissions cover the remainder not covered by Scope 1 and 2, i.e. those from a company's value chain and are generally more challenging if they involve SMEs and the like with lower levels of capacity to report.

Maybank has a target of achieving net-zero carbon by 2050 and has announced that it is the first bank in Malaysia to establish a Scope 3 financed emissions baseline. For banks, financed emissions are indirect emissions related to loans, underwriting, investments and any other financial services[121].

Reconciling Standards with Developmental Agenda

Standards such as the TCFD are designed to raise the level of climate preparedness and assessment within the financial industry. However, there is a developmental question about whether the developing country members of the G20 and other developing countries can readily adopt a tool that may be designed for developed countries who are expected to take the lead in climate action pursuant to their UNFCCC obligations.

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[118] Hasanbeigi (2022)
[119] World Steel Association (2020)
[120] Steel Orbis (2020)
[121] Maybank (2022)

The United Nations Environment Programme noted in its 2021 Production Gap report on fossil fuels that, "G20 countries have directed around USD 300 billion in new funds towards fossil fuel activities since the beginning of the COVID-19 pandemic — more than they have toward clean energy. In contrast, they have significantly decreased new international public finance for fossil fuel production in recent years"[122].

BNM is also attempting to prepare the financial sector for climate change via guidance on Climate Risk Management and Scenario Analysis and the Climate Change and Principle-Based Taxonomy[123].

8. Rethinking Assumptions

An exhaustive reconciliation of Malaysia's national development strategy and grand strategy with its climate treaty responsibilities, climate data, current knowledge on its climate vulnerabilities and its climate policies, is beyond the scope of this present working paper. However, in lieu of that more comprehensive work this section offers some rethinking of assumptions underlying some existing climate-related policies. They represent areas for further research.

8.1. Net-zero

Climate ambition tied to the Paris Agreement can be expressed as a target date for reaching net-zero emissions. Since Malaysia is an early adopter among developing countries of a net-zero target it is important to understand what this means, the fairness of such a commitment and its potential distributional impacts on Malaysia.

The Scientific Origins of Net-Zero

The concept of net-zero has its origins in physical climate science. Meeting the objective of keeping the rise in global average temperatures to between 1.5°C and 2°C implies that there is a finite budget of carbon dioxide and other GHGs that are allowable in the atmosphere. Further releases beyond this budget need to be balanced by removal of sinks[124]. Thus, the net sum of all global emissions and removals would be zero.

According to the IPCC, the carbon budget remaining for a 50% chance to meet the 1.5°C warming target was around 500 Gt(CO_2) from the beginning of 2020[125]. This carbon budget may be

[122] UNEP (2021)
[123] BNM (2021a); BNM (2021b)
[124] Fankhauser, et al. (2022)
[125] IPCC (2021)

depleting at a rate of 40 Gt(CO_2) a year[126]. This is why the present decade is seen as so critical for the peaking of global emissions before ensuring they fall to net-zero around 2050.

The carbon budgets calculated by scientists apply to the global atmosphere, not individual countries or firms[127]. They therefore need to be translated into individual decarbonisation pathways for sub-global entities. Establishing the scope, timing, fairness and credibility of individual targets is left to countries to spell out in their respective NDCs and in firms self-regulated commitments.

At a global scale there are different optimal timelines for different greenhouse gases to arrive at net-zero. Put simply, for a good chance at 1.5°C warming CO_2 emissions need to reach net-zero by around 2050. Other GHGs need to reach net-zero within a few decades of that. CO_2 is more readily removed or reduced than non-CO_2 GHGs such as methane, for which there is currently no available technology to remove them from the atmosphere[128]. Therefore, Malaysia's net-zero GHG pledge of "by earliest 2050" is broadly defensible from this basis, though there will eventually be calls to spell out details on the pathway and a credible balance between emission reductions at source versus removals and offsets. Offsets in particular have raised worries about lacking integrity[129].

The Global Stocktake 2023

The Paris global stocktake is the process that could determine if individual commitments add up to a global net-zero state consistent with the temperature target. Countries can hold each other to account, as can non-state stakeholders based on the publicly-available information submitted by each Party.

Malaysia and its coalition allies can use the global stocktake process to hold biggest global emitters to account, not just for their rapid decarbonisation efforts, but also for commitments on climate finance and technology transfer to developing countries to ease the process of climate action in the context of sustainable development.

Equally, Malaysia must now be prepared for pressure and expectations to focus on its emissions reductions while it tries to balance other development priorities. It is important for Malaysia's implementation of its net-zero goals to be socially and economically just.

Balancing Malaysia's Net-Zero Aspiration

Climate data establishes that Malaysia is a relatively small emitter of greenhouse gases in global cumulative terms. These relatively low levels of emissions combined with a generous endowment of carbon sinks may make achieving net-zero for Malaysia seem somewhat easier than it does for

[126] European Space Agency (2022)
[127] Fankhauser, et al. (2022)
[128] Rogelj, et al. (2021)
[129] Fankhauser, et al. (2022); Rogelj, et al. (2021)

the US. However, net-zero is not just a finishing line that is simply crossed once. It is about maintaining a dynamic equilibrium.

In the presence of continuing (albeit moderating) population growth and a desire to expand the economy, there will be upward pressure on emissions if marginal energy demand is to be met with marginal growth in fossil fuel supplies. This implies a need for countering emissions growth with energy efficiency measures and substituting in renewable energies. This is in addition to removals where feasible and credible. Complementary measures include reducing emissions from transport, particularly by displacing private vehicles (whether internal combustion or electric) with public transport. These and associated decarbonisation measures will be needed in the long run to thoroughly decouple economic growth from emissions growth.

These measures will require greater investment, technology development and transfer, as well as economic diversification to mitigate the risks of economic dependency on petroleum revenues. Malaysia will likely benefit from taking full advantage of available climate finance. Malaysia should also learn to take better advantage of foreign investment to generate economic spillovers such as technology transfer and industrial upgrading of local firms.

A Fair Pace for Net-Zero

Malaysia will also have to make decisions about its rate of decarbonisation. The Paris Agreement recognises that peaking will take longer for developing countries as they pursue sustainable development and poverty eradication (Article 4(1)).

To that end the flexible landing date of achieving net-zero "by earliest 2050" should be maintained until such a time when it is deemed fair to be more specific. Fairness will be a function of consultation with domestic actors as well as the progress of developed countries in meeting the Paris goals.

The flexibility afforded by the "by earliest 2050" wording is particularly useful now since a national low-emission pathway has yet to be mapped out. Ideally, a feasibility study and a transition pathway should have been researched and explored first, reconciled with national development ambitions, then held for a strategic time.

Malaysia may have overplayed its hand by being amongst developing countries setting an early net-zero goal before fully leveraging conditionalities tied to finance and technology transfer. These conditions were also abandoned in its revised GHG emissions intensity goal declared in the 2021 NDC submitted at COP26[130]. This does not prevent Malaysia from pursuing fulfilment of finance and technology pledges from developed countries, but it may weaken its negotiating options. These can be strengthened by working in coalitions pursuing conditional delivery. Conditionality is provided for under Article 4(7) of the UNFCCC. Conditionality is used by other developing countries in their NDCs.

[130] KASA (2021)

Distributional Measures – Adaptation and Sectoral Apportionment

Adaptation is part of an holistic climate strategy – It is important not to lose sight of the fact that net-zero is a concept primarily designed to meet a temperature goal consistent with climate stabilisation at an acceptable level. Net-zero mitigation-related measures do not represent holistic climate action in the absence of adaptation and measures to tackle physical risks. Neglecting adaptation measures and enabling finance for them would risk leaving segments of Malaysia vulnerable to current and future climate changes. This could negatively impact their prospects for sustainable development. A holistic climate strategy must provide for adaptation alongside net-zero mitigation. Assessments should be conducted to determine what is the optimal balance between the two for a balanced national climate strategy.

Sectoral apportionment of mitigation burdens should be assessed – The net-zero target is more restrictive on Malaysian corporations since they are working with an aspirational 2050 landing date. There is as yet no policy signal on the sectoral apportionment of decarbonisation burdens amongst Malaysian sectors or industries. Currently, all companies in all sectors are facing the net-zero challenge irrespective of size or individual resources.

Sectoral apportionment could provide a way to fairly share mitigation burdens within the corporate sector on the basis of the relative size of company emissions versus Malaysia's 'net positive' emissions, the relative resources of a given company, and the transition risks a company faces. Emissions reductions or firm-level net-zero undertaken by the most well-resourced and emissions intensive Malaysian firms may spare more vulnerable sectors from an unfair or unfeasible burden of adjustment. Simply put, can or should companies in Malaysia's energy-related sectors resolve much of Malaysia's net-zero challenge and shield the SME sector from potentially unfair transition costs?

Going by the last available official data, Malaysia's net emissions in 2016 were 75 mtCO2e[131]. State-owned electricity company Tenaga Nasional Berhad (TNB) reported emissions that year of 29 mtCO2e[132]. TNB only supplies Peninsular Malaysia. Sabah and Sarawak are covered by their respective state electricity companies. PETRONAS, Malaysia's national oil company, reported 2016 group emissions of 48 mtCO2e[133]. The combined emissions of TNB and PETRONAS for 2016 amount to 77 mtCO2e, more than Malaysia's net emissions of 75 mtCO2e.

Both TNB and PETRONAS have announced net-zero aspirations for 2050. While their annual emissions may not always match or exceed Malaysia's net emissions in any given year, they could represent the capacity to deliver the bulk of the net-zero pathway for the country. A shift in TNB's value chain (scope 3) emissions could move the needle for its customers in the rest of the economy. The costs and consequences of PETRONAS's net-zero pathway need to be weighed up carefully given that they are unlike a private oil company and have a mandate to contribute to

[131] KASA (2020)
[132] TNB (2017)
[133] PETRONAS (2016)

Malaysia's national development. Economic diversification measures are being considered to mitigate their transition risks, including in partnership with TNB[134].

The companies mentioned above are illustrative. More data based assessment of trade offs would help determine a national policy that is both strategic and fair in terms of apportioning transition burdens.

8.2. De-linking GDP and emissions growth

It may seem commonplace to speak of decoupling or delinking GDP and emissions growth in decarbonisation discussions as an end state that most if not all economies can aspire to. However, only a minority of countries have achieved this in practice as of 2018. According to one recent study, only 14 countries out of 116 have achieved absolute decoupling between GDP and both production- and consumption-based emissions[135]. Even then, these countries are still adding emissions to the atmosphere. Decoupling can be temporary, and decoupled countries may switch back to increasing emissions, which means that continuous efforts are needed to maintain decoupling[136].

Countries achieving decoupling have tended to be developed countries. This implies that the passage to decoupling may lie through high levels of GDP and the associated resources that come with that. This may support the need to balance economic development with decarbonisation. Provisions in the UNFCCC and Paris Agreement support these findings, namely that peaking will take longer for developing countries.

This also casts a shadow over the ease of achieving GDP-emissions decoupling. There is a considerable literature on the challenges of global economic convergence and the structural barriers to achieving it[137]. Effectively, this means that the concerns of what are variously known as industrial policy or structural transformation fall squarely within the concerns of climate strategy. This applies not only to developing countries, who would be the immediate beneficiaries, but also for developed countries who are interested in preaching progressive low-emission development pathways for developing countries.

However, advances in this area may run against nativist and protectionist sentiments because economic improvement in developing countries implies greater participation in world trade and competitive pressures on developed country products. We will examine this more in the subsequent section on carbon border adjustment mechanisms. Reducing imported emissions can

[134] PETRONAS (2022)
[135] Hubacek, et al. (2021)
[136] Hubacek, et al. (2021)
[137] See the annual Trade and Development Reports by UNCTAD, the work of economic historian Angus Maddison and Chang (2002).

be an important mechanism for decoupling[138]. However, it is important that this is pursued equitably. This is an important area for further research.

8.3. Carbon Pricing

"The first essential element of climate change policy is carbon pricing"[139]. This dictum by climate economist Nicholas Stern appears to have been heeded, at least somewhat, by the Coalition of Finance Ministers for Climate Action (CFMCA) who have made it the third of their Helsinki principles (the first being aligning policies and practices with Paris Agreement commitments)[140].

Malaysia joined the CFMCA in 2021 and via its budget committed to introducing voluntary carbon market (VCM) in Budget 2022 and announced the intention to pursue a carbon tax in Budget 2023. Carbon trading and carbon taxes are the typical forms carbon pricing takes.

Debates on carbon pricing are highly theoretical. It aligns with mainstream economic theory concerns about assigning a price to externalities and pursuing cost efficiency. Notably, cost efficiency has been expressed in terms of leveraging international and sectoral price differentials by: i) reducing the costs of emissions abatement in developed countries by purchasing reductions or offsets in developing countries; or, ii) by doing the same across sectors.

The Stern Review which fronted these arguments was written for the British Treasury at a time when the Kyoto Protocol and its flexible mechanisms were still in existence. To its merit the Stern Review attempted to argue that the benefits of strong early action in climate change outweigh the costs of not acting. However, its proposals on the central policy role of carbon pricing has lasted long beyond the Kyoto Protocol.

Deficiencies in Carbon Pricing Proposals

One deficiency in carbon pricing proposals, including carbon taxes, is that they focus on current emissions when historical cumulative emissions constitute the major forcing element in global warming. It thus disproportionately penalises present high emitters compared to historically large emitters. This may be inquitable in a broader context of sustainable development given the correlation between higher levels of GDP and emissions decoupling.

Some of the blind spots may be due to a concentration of carbon pricing effectiveness studies on Europe, which has already achieved high levels of GDP and technology. According to Green (2021) who reviewed studies since 1990, "only 37 studies assess the actual effects of the policy on emissions reductions, and the vast majority of these are focused on Europe"[141].

[138] Hubacek, et al. (2021)
[139] Stern (2006)
[140] CFMCA (n.d.)
[141] Green (2021)

Does Carbon Pricing Reduce Emissions?

Does carbon pricing reduce emissions? Evidence from ex post analysis suggests they have limited impact[142]. Aggregate emission reductions are limited, generally 0% to 2% annually, with considerable variation across sectors. Carbon taxes perform better than emissions trading schemes (ETS). The EU-ETS, the oldest ETS, only produced average annual reductions of 0% to 1.5% per year[143]. For comparison, the IPCC states that global emissions must fall by 43% by 2030 in order to limit warming to 1.5°C[144]. We could conclude that carbon pricing has a limited impact on emissions.

Carbon taxes may attractive as a revenue raising option for treasuries that face diversification issues. Given their limited effectiveness, this raises the usual distributional concerns about whether the introduction of a tax would be regressive or not. However, their effectiveness in promoting decarbonisation should be evaluated against available evidence.

In countries where energy forms a relatively small portion of GDP carbon prices will struggle to 'wag the tail of the dog'[145]. Due to the first and second laws of thermodynamics up to two-thirds of energy is lost during conversion into useful forms such as mobility or electricity. Policy measures for substituting coal for gas, and renewables and efficiency measures for all other energy forms may be more effective in delivering emission reductions at source.

Alternative Approaches

More constructive mechanisms for avoiding emissions may be increasing the Ecological Fiscal Transfer (EFT) mechanism that pays states to preserve their carbon sinks[146]. Budget 2023 proposed increasing the allocation for this from RM70 million to RM100 million. The quantum is still too small to discourage land conversion when spread amongst 13 states, but the mechanism exists. It includes conditionalities and the quantum should be increased.

The International Energy Agency (IEA) has stressed that energy efficiency is one of the most effective emission reduction tools available, behind global deployment of renewable energy. It could deliver up to 40% of the abatement required by the Paris Agreement[147]. This compares very favourably to the 0% to 2% improvements offered by carbon pricing.

8.4. EU Carbon Border Adjustment Mechanism

The European Commission has proposed a carbon border adjustment mechanism (CBAM). It is a form of carbon pricing, effectively a trade tariff on goods originating from countries with more

[142] Green (2021)
[143] Green (2021)
[144] IPCC (2022a)
[145] Taylor (2021)
[146] KETSA (2022)
[147] IEA (n.d.)

carbon-intensive production. It aims to prevent 'carbon leakage' by subjecting the import of certain groups of products from 3rd (non-EU and non-EFTA) countries to a carbon levy linked to the carbon price payable under the EU Emissions Trading System (ETS) when the same goods are produced within the EU[148].

The following goods have been proposed to be within the scope of the CBAM: imports of aluminum, ammonia, cement, electricity, fertilizers, hydrogen, iron and steel, organic chemicals, and plastics, as well as complex goods that use these products as inputs. The list of products covered by the CBAM may be further expanded in the future. Imports of goods that were subject to a carbon price during the production process may deduct the cost of those carbon prices from the import charge[149].

The CBAM is expected to take effect from January 2023 with a transitional period until 2027.

CBAM: A Trade Threat?

The emergence of CBAM has generated worry that it is a significant threat that Malaysia needs to comply with and that its use will become universalised. Here we will briefly cover:

- the degree of exposure Malaysia may have to the CBAM;
- the CBAM's climate effectiveness; and,
- potential potential policy responses Malaysia can adopt that include both compliance and challenge.

Table 9: Malaysia, Top Export Markets by Destination, 2020-2021 (RM '000)

Rank	Country	2020	2021
1	China	159,222,992	192,474,596
2	Singapore	142,145,579	173,973,855
3	Asean (Excl. Singapore)	130,833,717	169,529,119
4	United States Of America	109,080,342	142,243,703
5	**European Union**	**84,354,966**	**103,720,634**
6	Hong Kong, Sar	68,166,845	76,706,163
7	Japan	62,561,420	75,816,437
8	India	30,403,787	45,202,828
9	Taiwan, Province Of China	33,873,530	40,624,718
10	Korea, Republic Of	34,713,835	38,224,156

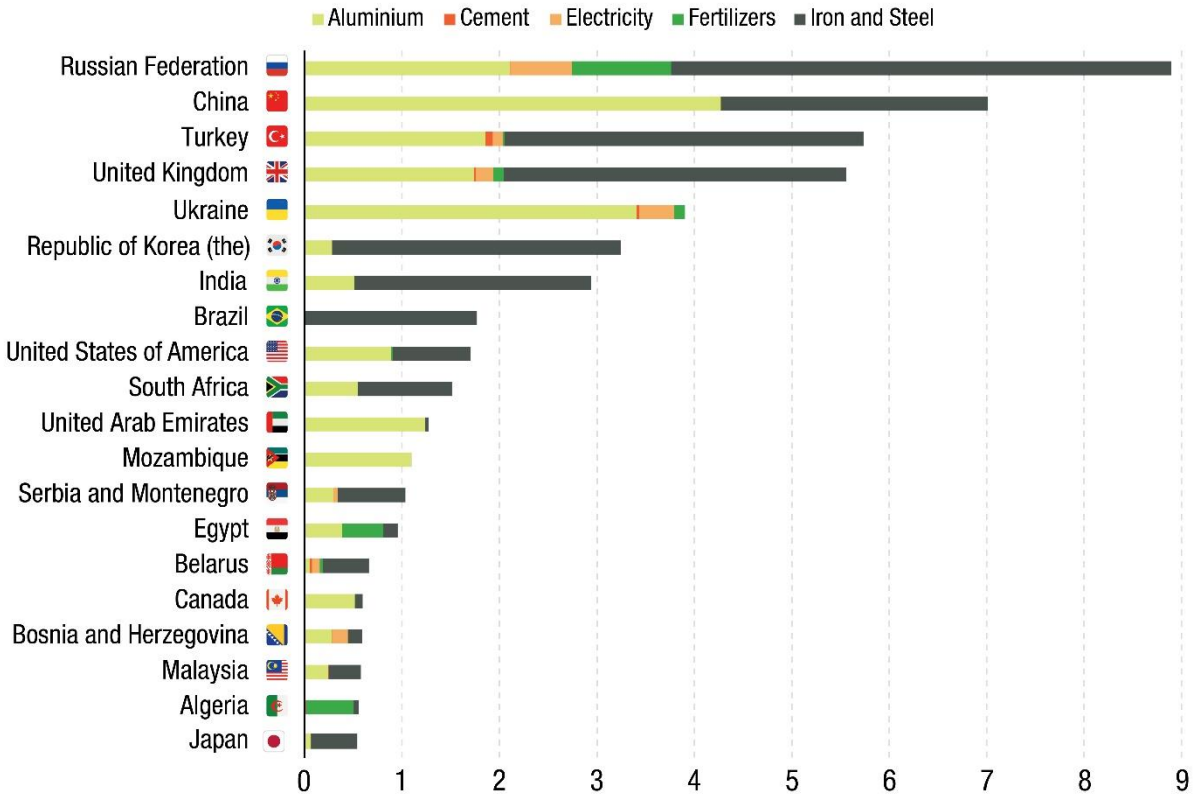
Source: DOSM (2022)

The EU is Malaysia's fifth largest export destination if we split our ASEAN exports into Singapore and the rest of ASEAN, given that Singapore represents more than half of our intra-ASEAN exports (See Table 9). Exports to the EU were around 30% of the value of total exports to ASEAN in 2021. While the near-term impact of the CBAM is limited to the aluminium and iron and steel exports to there, the list of products affected by CBAM may be expected to grow if CBAM is not challenged.

[148] Deloitte (2022)
[149] Weil (2022)

An UNCTAD study on the impacts of CBAM on developing countries found Malaysia ranked 18th amongst the 20 countries most exposed to CBAM, based on 2019 exports to the EU. Exposed goods were limited to aluminium and iron and steel. Exports by developing countries across the targeted carbon-intensive sectors would be reduced by 1.4% to 2.4%, depending on the country's export structure and carbon intensity of production (Figure 14 shows the relative value of exports in 2019)[150].

Figure 14: Exports to the European Union 2019 in selected sectors to be considered in the CBAM. 20 most-exposed countries in terms of aggregated value of exports (USD billion)



Source: UNCTAD (2021)

UNCTAD found that the CBAM would reallocate wealth from poor to rich countries. With a CBAM based on a carbon price of $44 per tonne, the income of developed countries would rise by $2.5 billion, while that of developing nations would fall by $5.9 billion[151]. However, potential employment effects would be small for all countries.

CBAM Barely Reduces Emissions

A CBAM would be effective in reducing carbon leakage, but it would be a very ineffective mechanism in mitigating climate change. UNCTAD found that CBAM would only cut 0.1% of global

[150] UNCTAD (2021)
[151] UNCTAD (2021)

CO_2 emissions. CBAM would only reduce EU emission by 0.9%[152]. By comparison, the EU's materials state that it is introducing the CBAM "towards realising the EU's ambitious target of a 55% reduction in carbon emissions compared to 1990 levels by 2030"[153]. CBAM would therefore be an internationally inequitable and ineffective means towards meeting the EU's climate goals.

While CBAM is ineffective in its climate goals, it delivers trade protectionist benefits to the EU. UNCTAD found that looking at bilateral trade reveals that the European Union "significantly increases intra-regional trade and all other regions reduce trade with the European Union, while often increasing trade with other regions"[154]. UNCTAD concludes that "the CBAM has the equivalent effect as a tariff increase by a trading block, increasing intra-block trade and diverting trade of trading partners to other regions"[155].

Challenging CBAM at the WTO

The EU's Carbon Border Adjustment Mechanism could be challenged in the World Trade Organisation as a form of protectionism. The EU is aware of this and has attempted to establish a 'WTO-compliant' CBAM[156]. The CBAM could be inconsistent with WTO rules. These include Articles I, II, and III:4 of the General Agreement on Tariffs and Trade (GATT) on Most-Favoured-Nation Treatment, Schedules of Concessions, and National Treatment on Internal Taxation and Regulation[157]. These rules govern discrimination between and among like imported products originating in different WTO member countries, and require imported products be given no less favourable treatment than that given to like domestic products (national treatment). CBAM implementation could therefore leave the EU open to WTO challenges. China has already indicated that it sees CBAM as a violation of the WTO, UNFCCC and Paris Agreement[158].

CBAM and Climate Injustice

CBAM's formulation shares an omission common to all carbon pricing efforts, which is a 100% discount on historical emissions and a diversionary focus on present and future emissions. It thus exculpates developed countries from their historical responsibility for today's climate change and focuses disproportionate blame and burden on industrialising developing countries. It therefore has an equivalent effect to developed country trade protectionist instruments and strategies that seek to reduce the competitive threat from industrialising developing countries, especially India and China, by 'kicking away the ladder'.

CBAM is founded on the idea that there needs to be a level playing field between Europe's products and those of more carbon-intensive countries. This is to be 'fair' to European companies who may incur costs adopting less carbon-intensive production methods. Since it is based on present emissions it ignores Europe's role as the second largest contributor to historical carbon

[152] UNCTAD (2021)
[153] European Commission (2021)
[154] UNCTAD (2021)
[155] UNCTAD (2021)
[156] Sapir (2021)
[157] Bacchus (2021)
[158] China Trade Monitor (2021)

dioxide emissions. In the process of burning fossil fuels and mass deforestation for agricultural expansion, Europe was able to raise its standard of living and technological development to one of the highest in the world. Some of the countries that face trade penalties from CBAM were also colonies of European nations during this time.

The developing countries that are the target of CBAM do not enjoy a comparable level of financial and technological capability to rapidly upgrade their production processes to remain competitive with European equivalents, nor do they have anywhere near the historical responsibility for climate change that Europe possesses. Thus, while CBAM appears to be a climate-friendly mechanism to promote fairness for European producers, in a global perspective it is a form of climate injustice that is a protectionist and discriminatory mechanism.

Environmental Double Standards in the EU

The domestic policy context of CBAM also shows environmental double standards in 2022. While CBAM was passed by the European Parliament in June, the same body voted to allow fossil gas and nuclear investments as sustainable for investment in July 2022[159]. This move happened in the context of disruption of Russian gas supplies to Europe as a result of the Russian invasion of Ukraine. European countries such as Germany have also been exploring Indonesian coal supply, potentially becoming the second or third largest importer of Indonesian coal after China and India[160]. This is leading to a situation where Europe is increasing its usage of gas and coal while putting in place measures to penalise goods from countries who are also reliant on these two fuels.

Strategic Options for Malaysia

What are appropriate strategic responses for Malaysian firms and the Malaysian government to take?

Compliance and Industrial upgrade. This is the response suggested or implied by some domestic climate advocates using CBAM as a threat. It is combined with sweeping assumptions about CBAM's universality and globalisation beyond the EU[161]. This involves additional costs for affected sectors, some of which may be economically sensitive.

Divert trade to alternate export markets. Exporters shift to non-EU markets. In 2019, the EU accounted for 8.5% of Malaysian iron and steel exports, whereas ASEAN absorbed nearly 30% followed by South Korea (15%)[162].

WTO Action. China and other affected exporters may be willing to bring a case to the WTO's Appellate Body. Malaysia could bring its own case, join with other affected countries, or potentially benefit from the resolution of the case another country brings.

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[159] Financial Times (2022b)
[160] NikkeiAsia (2022)
[161] BCG & WWF (2022)
[162] Malaysian Iron and Steel Industry Federation (2019)

9. Conclusion

Ultimate Aims

The ultimate aim of Malaysian climate strategy should be climate-resilient development that minimises vulnerabilities and protects both people and country from climate impacts. Such impacts and vulnerabilities need to be addressed in both the present and future (on a 100-year timescale). This goal requires global climate stabilisation.

Achieving long-lasting climate stabilisation requires deep cuts in anthropogenic greenhouse gas (GHG) emissions on a global scale consistent with limiting net global warming to well below 2°C and preferably aiming for 1.5°C.

Limits to Domestic Mitigation

Malaysia's ability to contribute to mitigating global climate change via domestic action is constrained first by its small contribution to cumulative (0.4%) and current (0.7%) emissions. One can only cut as much as one emits, though every effort should be made to conserve and increase emission sinks. Focusing domestic climate action on emissions mitigation risks overstating Malaysia's culpability for global warming as being similar to long-industrialised countries such as the United States. The latter is responsible for over 25% of historical emissions.

Malaysia's second constraint lies with its limited industrial and financial capabilities. For example, Malaysia is a significant site of production of solar photovoltaic panels, the third largest in the world (in 2020)[163], but the sector is dominated by foreign companies who focus on export. There is little industrial spillover or local technology ownership. Malaysia's contribution to solar panel global value chains is primarily via the provision of tax incentives, land and infrastructure to host such manufacturing, similar to its overall relationship to foreign manufacturing capital. Malaysia's limited fiscal capacity to finance structural transformation means that a shift to a minimal emissions economy will take longer and present more opportunity costs than for developed countries.

Therefore, greenhouse gas mitigation in Malaysia has relatively limited potential for reducing global or local climate vulnerabilities in the near to long-term. However, Malaysia has made a net-zero by earliest 2050 pledge in its NDC to the UNFCCC and it may be expected to honour this, unless it chooses to revise it in the future.

Mitigation efforts in Malaysia may have to prioritise emission reductions in portions of sectors involved in global value chains. These firms may be required to reduce emissions as part of climate compliance for client corporations based in the global North. This likely represents only a minority share of the economy, but the exact amount should be studied by government.

Alternately, nominating a leading portion of Malaysia's companies to undertake emission reductions may help shield the more vulnerable SME sector from transition costs. The energy

[163] IEA (2022)

sector may present the opportunity for the greatest gains and, in any case, is likely to be under international scrutiny. Due regard should be taken for equity and socioeconomic distribution impacts of energy transition, especially with less-developed regions such as Sabah and Sarawak.

Diplomatic Pressure is Essential for Climate Stabilisation

If climate stabilisation is one of Malaysia's strategic objectives, then Malaysian mitigation efforts should prioritise applying diplomatic pressure on the biggest global polluters in multilateral climate fora, principally the UNFCCC and the Paris Agreement. Developed countries with large emissions and greater financial and technological capabilities are better able to take a lead in making the deep cuts consistent with climate science. They are also obliged to take the lead under these treaties.

Forests are a Strategic Development Reserve

Malaysia's carbon sinks have been capable of absorbing up to three-quarters of Malaysia's emissions. These forests and other ecosystems should be viewed as a strategic development reserves that significantly reduces the costs and complexity of achieving net-zero emissions. Conservation needs to be better financed in order to make this reliance on domestic sinks sustainable. International carbon credit trading would reduce Malaysia's available sinks and allow others to benefit from them in emissions accounting. Malaysia would then be faced with the costs of proportionate emissions abatement. Given the low prices of carbon credits this may not be an optimal or cost-effective trade.

Adaptation is Important but Neglected

Malaysia is vulnerable to climate impacts and much can be done to reduce the vulnerabilities of households and industries via climate adaptation measures. Such measures require more research and development to determine those most appropriate and suitable. Malaysia currently lacks a national adaptation plan. The development of one should be a priority.

Within the corporate sector greater attention should be placed on understanding and managing the physical risks posed by climate change to industrial sectors. This may require scientific knowledge that is currently not well disseminated. An overemphasis on mitigation metrics risks leaving the Malaysian corporate unprepared for climate adaptation.

Carbon pricing 'solutions' from developed countries need careful consideration for their suitability and effectiveness in the Malaysian and global context. Measures such as carbon taxes and emissions trading schemes are receiving more attention than more effective alternatives such as energy efficiency, or more relevant climate action such as adaptation.

A Balanced Approach

Malaysia is more vulnerable to climate change than it is historically responsible for climate change. A balanced approach towards Malaysian climate policy would see a greater emphasis on adaptation over mitigation, and a stronger emphasis on pursuing emission reductions from the world's largest polluters, who have consumed a disproportionate share of atmospheric space. This would be followed by efforts to moderate its own emissions in light of equitable shares of

the global atmospheric commons. This should be facilitated with financial and technological transfers from developed countries.

This approach should form the basis of a national climate strategy in pursuit of global climate stabilisation consistent with Malaysia's climate resilience and pursuit of sustainable development.

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