Assessing the Alignment of Nationally Determined Contributions (NDCs) and Climate Mitigation & Adaptation Policies with the Outcome of the First Global Stocktake (GST1) under the Paris Agreement:

A Case Study of Malaysia

Working Paper
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Abbreviations and Acronyms

BTR	Biennial Transparency Report
CCUS	Carbon Capture, Utilisation and Storage
CCS	carbon capture and storage
COP	Conference of the Parties to the UN Convention on Climate Change
CO_2	carbon dioxide
GDP	gross domestic product
GST	Global Stocktake
CWF	ClimateWorks Foundation
EECA	Energy Efficiency and Conservation Act
ETF	Enhanced Transparency Framework
ETS	Emission Trading Scheme
EVs	electric vehicles
EWS	early warning systems
GHG	greenhouse gas
ICSC	Institute for Climate and Sustainable Cities
IGES	Institute for Global Environmental Strategies
iGST	Independent Global Stocktake
IMO	International Maritime Organisation
INDC	intended nationally determined contribution
IPPU	industrial processes and product use
IRBM	integrated river basin management
IWRM	integrated water resources management
LULUCF	land use, land-use change and forestry
MEPS	Minimum Energy Performance Standards
M&E	Monitoring and evaluation
NAPs	national adaptation plans
NC	national communication
NDC	nationally determined contribution
NEP	national energy policy 2022–2040
NETR	National Energy Transition Roadmap
NPP4	Fourth National Physical Plan 2021–2040
REDD+	Reducing emissions from deforestation and forest degradation, sustainable management of forests, and the conservation and enhancement of forest carbon stocks in developing countries
SEA	Southeast Asia
TPES	total primary energy supply
12MP	Twelfth Malaysia Plan 2021–2025
UAE	United Arab Emirates
UTM	Universiti Teknologi Malaysia

Abstract

The outcome of the first Global Stocktake (GST1), concluded at COP28, is expected to firmly inform countries' next nationally determined contributions (NDCs), due in early 2025, so as to ensure that global efforts are on track to achieve the goals of the Paris Agreement. Taking Malaysia as a case study country, the objective of this study is to assess the alignment level of the outcome of GST1 with Malaysia's current NDC and other relevant climate policies for mitigation and adaptation using a simple assessment checklist and available policy documents. The assessment shows that while the country has made progress, gaps remain in fully aligning with global climate goals. Malaysia should focus on expanding its policy scope, setting more ambitious targets in renewable energy, energy efficiency, non-CO_2 gases and forests. It should also align existing policies with the NDC through stronger internal coordination. Malaysia's adaptation strategies indicate that the country is making good efforts, particularly in enhancing resilience and managing risks, but there is still a need for more ambitious and comprehensive actions across all sectors.

1 Introduction

1.1 Background and Objectives

At COP28 in Dubai, UAE, in 2023, the first Global Stocktake (GST1), which assesses the global collective progress towards meeting the long-term goals of the Paris Agreement, concluded with the adoption of its decision, known as the outcome of GST1 (UNFCCC 2023). The outcome of GST1 must firmly inform countries' next nationally determined contributions (NDCs), due in early 2025, so as to ensure that global efforts are on track to achieve the goals of the Paris Agreement. The outcome of GST1 includes information on the state of the collective progress and information that highlights future directions or milestones for countries to consider in forming the next round of their NDCs.

This was the first-ever GST, and as such, it has also been the first time for countries to consider the outcome of GST1, particularly those elements related to future directions or milestones, when updating NDCs in the follow-up of GST1. Since there are no formal guidelines assisting this consideration of the outcome of GST, it is up to countries to decide how to reflect the outcome of GST1 in their next NDCs. Because no country has done this before, it is vital to accumulate knowledge and practices in considering the outcome of GST1 in the NDC update process. This working paper aims to contribute to such knowledge building by sharing one case study focusing on Malaysia.

Specifically, our objective is to assess the alignment level of the outcome of GST1, particularly the future directions or milestones highlighted therein, with Malaysia's current NDC and other relevant climate policies using a simple assessment checklist and available policy documents. In this assessment, we assume that whenever the alignment level of the GST1 and the NDC is high, Malaysia's policies align with those directions or milestones. On the other hand, when the alignment level is weak, we assume that Malaysia's policies have potential areas of improvement that need to be strengthened in its next NDC, thereby ensuring that the country's policy efforts align with those directions or milestones more strongly than the current NDC.

Our focus is on both mitigation and adaptation. As explained later in the paper, an NDC is typically a concise, high-level summary of national climate policies and measures, which are mostly inclined toward a mitigation component. Therefore, to capture a comprehensive picture of a country's mitigation and adaptation policy efforts, policy documents other than the NDC were investigated, including national adaptation plans (NAPs). This working paper is structured as follows. Section 2 provides an overview of the GST and why it is important to consider its outcomes in the NDC update process under the Paris Agreement. Section 3 then briefly introduces Malaysia's climate policies, including its NDC, for mitigation and adaptation. Section 4 touches on the methodology, which includes the assessment checklist. It also explains policy documents used for the assessment. After Section 5 presents the assessment results for mitigation and adaptation, Section 6 summarises the findings and makes policy recommendations, considering Malaysia's next NDC and the second GST (GST2). Finally, Section 7 highlights the assessment's conclusions.

2

Overview of the Paris Agreement and the Global Stocktake (GST)

2.1 How does the Paris Agreement work and why is the GST important?

The Paris Agreement was adopted at COP21 in 2015 in Paris. It represents a landmark international treaty under the United Nations Framework Convention on Climate Change (UNFCCC). The three long-term goals of the Paris Agreement (Article 2) are:

> **Mitigation:** Limiting global temperature rise to well below 2°C above pre-industrial levels while pursuing efforts to limit the increase to 1.5°C.
>
> **Adaptation:** Enhancing adaptive capacity, strengthening resilience, and reducing vulnerability to climate change.
>
> **Finance:** Making financial flows consistent with a pathway for low greenhouse gas (GHG) emissions and climate-resilient development.

The agreement is based on the principle of common but differentiated responsibilities, recognising the varying capacities of countries to tackle climate change.

To achieve these goals, the agreement has three mechanisms:

> **NDCs** (Article 4): Countries are required to set their targets and actions, known as NDCs. NDCs represent the commitments made by each country to reduce national emissions and adapt to the impacts of climate change. These contributions reflect each country's ambition, tailored to its specific national circumstances, capacities and priorities. NDCs are updated every five years.
>
> **Enhanced Transparency Framework (ETF)** (Article 13): This provides clarity on the progress of NDC implementation and the achievement of NDCs. Countries submit Biennial Transparency Reports (BTRs) every two years, providing data and information on GHG inventories, and tracking of NDCs, among others.
>
> **GST** (Article 14): The GST is designed to assess the collective progress of countries towards achieving the Agreement's long-term goals. The GST process consists of 1) information collection and preparation, where data is gathered from various sources, including IPCC reports, NDC submissions and BTRs; 2) technical assessment through technical dialogues to review the progress and discuss the implications of the findings, and identifying gaps and areas for improvement; and 3) consideration of outputs, where the assessment results are synthesised into a decision, known as the outcome of the GST. The outcome is to inform future NDC updates, enhance international cooperation, and ensure global efforts stay on track to meet the Paris Agreement's goals.

2.2 What is the outcome of GST1 and why does its alignment with national climate policies matter?

The outcome of the GST1 contains information highlighting a number of specific directions or milestones for governments to consider in the next round of NDCs. Out of these, this study focuses on the six directions or milestones that we extracted from the information of the GST1 outcome for mitigation and nine that are for adaptation (see also the methodology section). This section briefly explains each of them.

2.2.1 Outcome of GST1 in relation to mitigation

1. ***Tripling global renewable energy capacity by 2030***

The GST1 highlights a significant commitment by governments to triple global renewable energy capacity by 2030, aiming to align with the Paris Agreement's target of limiting warming to 1.5°C. This includes enhancing renewable capacity and improving energy efficiency to support sustainable development goals, particularly in energy access. A just and inclusive energy transition is emphasised, calling for equitable support, especially for developing economies, through international cooperation in technology transfer, financing and capacity building.

2. ***Doubling the global average annual rate of energy efficiency improvements by 2030***

The GST1 underscores the urgent need to double the global annual rate of energy efficiency improvements to over 4% by 2030, aligning with the Paris Agreement's 1.5 °C goal. Achieving this requires a comprehensive approach, including the adoption of efficient technologies, cleaner fuels and improved technical efficiency across sectors. Governments are called to embed energy efficiency into policymaking as a top priority, with an emphasis on international cooperation, supportive policies, and investment to ensure sustainable, resilient energy systems that address both climate and economic goals.

3. ***Accelerating global efforts towards net zero emission energy systems, utilizing zero- and low-carbon fuels by around mid-century***

The GST1 underscores a global commitment to fast-track efforts for net zero emission energy systems by mid-century, essential to meeting the Paris Agreement goals. This transition involves adopting zero-carbon fuels like solar, wind, and hydropower, as well as low-carbon options like green hydrogen and bioenergy for sectors less suited to electrification. Key requirements include technological advancements, infrastructure upgrades, and enhanced energy storage and grid flexibility. Accelerating these efforts is not only crucial for climate mitigation but also offers economic benefits, fostering new industries, innovation, and green jobs for sustainable growth.

4. ***Accelerating substantial reduction of non-CO_2 emissions globally, especially, methane, by 2030***

The GST1 reflects a global agreement to significantly reduce non-CO_2 emissions, especially methane, by 2030, acknowledging their substantial impact on global warming. Methane, with a global warming potential over 80 times greater than CO_2 in the short term, is primarily emitted by agriculture, fossil fuel operations and waste management. This commitment involves measures to detect and repair leaks, improve waste practices, and promote sustainable agriculture. Reducing methane emissions can provide immediate climate benefits, supporting

near-term climate goals and reinforcing the broader effort to meet the Paris Agreement targets through comprehensive GHG mitigation strategies.

5. ***Accelerating the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero- and low-emission vehicles***

The GST1 outlines a commitment by governments to accelerate efforts to reduce road transport emissions, a major source of global GHGs. Key strategies include rapidly deploying zero-emission vehicles, such as electric and hydrogen fuel cell vehicles, supported by extensive infrastructure like charging stations and hydrogen refueling networks. This initiative also encompasses promoting low-emission options, such as hybrid vehicles, and encouraging public transit, cycling and walking. These efforts aim to reduce reliance on fossil fuels, improve air quality, and support a sustainable transition in the transport sector, adaptable to diverse regional needs.

6. ***Halting and reversing deforestation and forest degradation by 2030***

The GST1 reflects a global commitment to stop and reverse deforestation and forest degradation by 2030, recognising the critical role forests play in absorbing CO_2 and mitigating climate change. This commitment aims to protect existing forests, restore degraded lands and promote sustainable land-use practices. Key actions include enforcing regulations on land use, supporting sustainable agriculture and investing in reforestation. The initiative also involves collaboration with indigenous communities and local stakeholders, ensuring forest conservation benefits biodiversity, water resources and local livelihoods, and supports climate and environmental sustainability.

2.2.2 Outcome of GST1 in relation to adaptation

1. ***Increasing adaptation efforts to enhance adaptive capacity, strengthen resilience and reduce vulnerability***

Countries are increasingly integrating climate adaptation into national policies, focusing on enhancing adaptive capacity, building resilience, and reducing vulnerability. The GST highlights the progress in developing national adaptation plans (NAPs) and sector-specific strategies. However, adaptation efforts must be scaled up to meet the increasing climate risks, especially in vulnerable countries. Progress is context-specific, with developing nations requiring more financial and technical support to build climate resilience. Many countries are now recognising the value of local and indigenous knowledge in crafting effective adaptation strategies.

2. ***Improving monitoring and evaluation for tracking the progress and increasing the quality and awareness of adaptation action***

Tracking adaptation outcomes is critical to ensuring that efforts are effective and lead to long-term resilience. The GST1 emphasises that current adaptation monitoring frameworks need to be improved to capture both quantitative and qualitative data. Monitoring and evaluation (M&E) systems are often underdeveloped, particularly in vulnerable countries, hindering the ability to assess the effectiveness of implemented strategies. The GST1 calls for standardised M&E frameworks that can inform future adaptation policies, measure progress toward goals, and ensure adaptive measures are effectively reducing vulnerabilities.

3. ***Establishing and improving user-driven climate services systems, including early warning systems***

Effective adaptation requires accessible and user-driven climate services, such as early warning systems (EWS), to prepare populations for extreme weather events. The GST1 underscores the importance of establishing and improving such systems to enhance preparedness and reduce the impact of climate disasters. EWS and other climate services provide critical information that helps governments, businesses and communities make informed decisions. Countries that have invested in these services are better equipped to respond to climate-related hazards, but more effort is needed, especially in developing nations, to build these systems.

4. ***Accelerating urgent, incremental, transformational and country-driven adaptation action based on different national circumstances***

The GST1 stresses the need for urgent, country-specific adaptation actions that are both incremental and transformational. Each country's approach should be based on its unique vulnerabilities and socioeconomic context. The urgency of climate risks demands immediate short-term actions alongside long-term strategies. Countries must prioritise adaptation policies in alignment with their NDCs to meet the Paris Agreement's goals. Developing countries in particular are encouraged to pursue transformational changes in areas such as infrastructure, governance and resource management to build climate resilience.

5. ***Recognising that climate change has complex and cascading transboundary risks that require international cooperation***

Climate change introduces complex, cascading risks that transcend national borders, such as river systems, extreme weather and cross-border migration. The GST1 highlights the importance of international cooperation to address these shared risks effectively. For example, regional efforts on water resource management and coordinated disaster response systems are essential to mitigate cross-border climate impacts. Countries are encouraged to develop regional frameworks that facilitate cooperation on adaptation and foster shared strategies to manage transboundary risks.

6. ***Developing and implementing national adaptation plans (NAPs) by 2025 and start implementing their plans***

Long-term adaptation planning is essential for sustainable climate resilience. The GST1 reflects the need for countries to accelerate the development and implementation of NAPs by 2025. Effective NAPs ensure that countries have structured, forward-looking strategies for climate adaptation, focusing on both immediate needs and long-term challenges. Planning must also integrate multiple sectors and be dynamic enough to adjust as climate risks evolve. Countries must establish clear pathways for moving from planning to implementation, with adequate financial and technical support, especially for developing nations.

7. ***Recognising the adaptation cycle for building adaptive capacity, strengthening resilience and reducing vulnerability is essential***

The adaptation cycle—comprising risk assessment, planning, implementation, and monitoring, evaluation, and learning (MEL)—is central to building adaptive capacity, strengthening resilience and reducing vulnerability. The GST1 calls for a continuous, iterative process that allows countries to assess their climate risks, plan responses, implement adaptation actions

and evaluate the outcomes for continuous improvement. Establishing strong institutional frameworks and building local capacity to implement the adaptation cycle are essential, particularly in regions most affected by climate change.

8. ***Implementing integrated, multi-sectoral solutions, such as land-use management, sustainable agriculture, resilient food systems, nature-based solutions and ecosystem-based approaches***

The GST1 encourages countries to implement integrated, multi-sectoral adaptation strategies, such as sustainable agriculture, land use management and ecosystem-based approaches. These approaches recognise the interconnectedness of different sectors and aim to maximise the co-benefits of adaptation actions across sectors like food security, water management and biodiversity conservation. Integrated solutions not only enhance resilience but also promote sustainability by preserving ecosystems and reducing GHG emissions. Nature-based solutions, such as reforestation and wetland restoration, are increasingly recognised for their role in enhancing adaptation.

9. ***Implementing sector-specific adaptation strategies***

While integrated approaches are important, the GST1 also stresses the need for sector-specific adaptation strategies to address the unique challenges faced by different sectors. For instance, agriculture, water resources, infrastructure and health each face distinct climate risks that require targeted interventions. Sector-specific adaptation ensures that strategies are tailored to address particular vulnerabilities, such as drought-resistant crops in agriculture or resilient infrastructure in coastal areas. Countries are encouraged to develop detailed sectoral adaptation plans that complement national strategies.

The outcome of the GST1 offers an opportunity to review and assess the alignment of national climate policies with the directions or milestones set by the global community. Through the lens of the outcome of the GST1, countries can scrutinise their NDCs against those directions or milestones, and then identify areas of improvement, which they can consider in the next round of their NDCs. Overall, the outcome of the GST1 helps countries to ensure they are on track to meet their international commitments and contribute effectively to the global climate goals.

3

Malaysia's NDC and national climate policies

Malaysia has a 20-year history of developing and implementing national climate policies. Key milestones in the development of Malaysia's climate policies are shown in Table 1.

Along with these policy developments, the Government of Malaysia submitted its intended nationally determined contribution (INDC) to the UNFCCC in 2015 (GoM, 2015), which became its first NDC upon ratifying the Paris Agreement on 16 November 2016. Malaysia updated its NDC in 2021 (GoM, 2021), increasing its ambition to reduce economy-wide carbon intensity by 45% against GDP by 2030 compared to 2005 levels. This updated target is unconditional and reflects a 10% increase from the previous submission.

For Malaysia, the submission of its NDCs is a key element in demonstrating the country's commitment to global climate goals and reflecting its national policy objectives in alignment with sustainable development. The NDCs outline Malaysia's targets for reducing emissions, enhancing resilience to climate impacts, and integrating climate considerations into national planning processes. These commitments are not static; the Paris Agreement encourages countries to update and enhance their NDCs every five years, progressively increasing their ambition in line with global efforts.

The Ministry of Environment and Water is leading the continuous development of Malaysia's NDCs, coordinating with various stakeholders to evaluate progress and enhance the strategies outlined in the NDCs.

Table 1: Milestones in Low Carbon Development Policies

Year	Milestone
2002	National Policy on the Environment
2009	National Policy on Climate Change
2009	National Green Technology Policy
2009	National Renewable Energy Policy and Action Plan
2011	Low Carbon Cities Framework (LCCF)
2017	Green Technology Master Plan Malaysia 2017–2030
2017	Second National Urbanisation Policy (DPN2)
2019	National Energy Efficiency Action Plan (NEEAP)
2021	4th National Physical Plan (NPP4)
2021	Twelfth Malaysia Plan 2021–2025 (12MP)
2021	National Low Carbon Cities Masterplan (NLCCM)
2022	National Energy Policy 2022–2040 (NEP)
2023	National Energy Transition Roadmap (NETR)

4

Methodology and data

This study analyses the level of alignment of the future directions or milestones as contained in the outcome of GST1, with Malaysia's current NDC and other relevant climate policies. To do this, an assessment checklist for scoring was developed in an Excel file (IGES, forthcoming). Following this, Malaysia's key policy documents were reviewed and assigned with scores.

4.1 Scoring checklist

The checklist is designed to disaggregate information elements relating to future directions or milestones as reflected in the outcome of the GST1 into specific, actionable questions. Responding to these questions with scores, based on policy document reviews, enables us to assess the alignment level of Malaysia's climate policies. The question style is chosen because it is easy to understand and follow. We hope that a wider range of stakeholders can subsequently use the checklist once it has been published (IGES, forthcoming). The checklist includes 25 questions for mitigation and 10 for adaptation, depending on the content and specificity of information in the outcome of GST1. These questions are structured as follows:

General Information	Information about the policy document, including the name of the policy; year of enforcement; relationship with the NDC; area focus (mitigation or adaptation or others); sectoral focus; and a link to full text, if available.
Mitigation_Overview	An overview of the mitigation component of the policy document, assessing the types of GHGs, sectoral coverage, and the type of mitigation target.
Mitigation_Energy	Mitigation policy efforts within the energy sector, relating to renewable energy, energy efficiency improvements, the transition to net zero emission energy systems and reduction of non-CO_2 emissions.
Mitigation_Transport	Mitigation policy efforts within the transport sector, aimed at reducing emissions from road transport, the adoption of zero- and low-emission vehicles, and infrastructure development.
Mitigation_Forest	Mitigation policy efforts within the forest sector, including halting and reversing deforestation and forest degradation.
Adaptation	Adaptation policy efforts, covering, such as, efforts to enhance adaptive capacity, strengthen resilience, and reduce vulnerability; monitoring and evaluation of outcomes; user-driven climate services systems; country-driven adaptation action.

Each question is scored based on the information provided in the reviewed policy document. The scoring is categorised as follows:

Yes	The policy fully addresses the question. (High alignment)
Partially Yes	The policy partially addresses the question. (Medium alignment)
No	The policy does not address the question. (Limited/no alignment)
N/A	The question does not apply to the policy document being reviewed. (not assessed)

In this Malaysia assessment, a total of five policy documents were reviewed, including four for mitigation and one for adaptation. Since multiple policy documents were assessed for mitigation, the results of the checklist of these mitigation policy documents were combined, and the highest score among the policy documents was selected as the overall result of mitigation. Examples of the completed checklists can be found in the Appendix.

4.2 Reviewed policy documents

A list of policy documents reviewed and reasons for their selection are summarised in Table 2. For mitigation, the assessment focused on energy sectoral policies, in addition to the overall climate policies. The energy sector is the largest emission source in Malaysia, therefore this sector is crucial when assessing the alignment level of Malaysia's policies with the outcome of GST1.

Table 2: Policy documents reviewed in the assessment

1. Twelfth Malaysia Plan 2021—2025 (12MP) (EPU, 2021)	This five-year national development plan serves as a critical reference for national climate policy. Notably, Chapter 8 is dedicated to environmental sustainability and marks the first time Malaysia officially commits to becoming carbon neutral, making it a crucial source for evaluating the country's climate commitments and alignment with global climate goals.
2. National Energy Policy 2022—2040 (NEP) (EPU, 2022)	This NEP was selected for assessment due to its pivotal role in outlining Malaysia's long-term strategy for achieving a low-carbon future by 2030 and beyond. As the most recent national policy on energy, it sets ambitious targets for renewable energy adoption, energy efficiency improvements, and the promotion of electric vehicles (EVs). The policy aligns with Malaysia's commitment to global climate goals and provides a clear framework for the energy sector toward sustainability.
3. National Energy Transition Roadmap (NETR) (MoEM, 2023)	This Roadmap is a critical strategy that outlines Malaysia's pathway towards energy transition and sustainable economic growth. It emphasises the shift from traditional fossil fuels to renewable energy and green hydrogen, which are key to achieving net zero emissions by 2050. The NTER also highlights the importance of energy development in driving economic progress and job creation.
4. Nationally Determined Contribution (NDC) (GoM, 2021)	Malaysia's NDC as of 2021 (latest at the time of writing) provides a comprehensive and updated framework that reflects the country's commitment to reducing greenhouse gas emissions. Submitted to the United Nations Framework Convention on Climate Change (UNFCCC), Malaysia's NDC outlines a target of reducing carbon intensity by 45% by 2030, compared to 2005 levels. This submission ensures transparency, accuracy and sector-wide inclusion, making it a vital tool for evaluating Malaysia's progress against global climate goals.
5. Fourth National Communication (NC4) (MNRECC, 2024)	For assessing the adaptation policies of Malaysia, adaptation communications, which shall be recorded in a public registry maintained by the secretariat of UNFCCC according to Article 7 paragraph 12 of the Paris Agreement, are suitable. According to the UNFCCC, the "four main vehicle documents for adaptation communication" refers to NAP, NDC, BTR and national communication (NC) (UNFCCC, 2022). Malaysia's government has not yet submitted its NAP, and therefore, the Fourth NC (NC4), which is recorded in the above adaptation communication registry, is analysed in this research.

5

Results

5.1 Mitigation overview

5.1.1 Greenhouse Gases

Table 3: Greenhouse Gases

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC and/or other national climate policy documents cover all types of greenhouse gases (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3)?	Yes	No	No	No	Yes

Malaysia' NDC covers all the specified seven gases.

5.1.2 Sector Coverage

Table 4: Sector Coverage in National Climate Policies

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC and/or other national climate policy documents cover all sectors?	Yes	Yes	Yes	No	Yes

Malaysia' NDC covers all sectors, including energy; industrial processes and product use (IPPU); agriculture; land use, land-use change and forestry (LULUCF), and waste sectors. Moreover, 12MP covers "Advancing Green Growth for Sustainability", and NTER covers "Human Capital and Just Transition", highlighting national priorities and focuses, in addition to those sectors specified by the outcome of GST1.

5.1.3 Absolute Emission Reduction Target

Table 5: Absolute Emission Reduction Target

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC and/or other national climate policy documents set an absolute emission reduction target?	No	No	No	No	No

The NDC includes an emission intensity target aiming to reduce economy-wide GHG emissions intensity to GDP by 45% in 2030 compared to the 2005 level. This consists of a 35% reduction as its unconditional target and 10% as its conditional target, contingent on receiving international support.

In addition, NETR specifies a sectoral target of a 32% reduction in GHG emissions by 2050 compared to the 2019 level for the energy sector. However, this target is not consistent with the broader goal of achieving net zero GHG emissions by 2050 as outlined in the NEP.

5.2 Energy

5.2.1 Renewable Energy

5.2.1.1 Tripling Renewable Energy

Table 6: Tripling Renewable Energy

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information aligned with and/or contributing to tripling global renewable energy capacity by 2030?	No	No	Partially Yes	Partially Yes	Partially Yes

Malaysia's NDC does not explicitly commit to the global target of tripling renewable energy capacity by 2030. Conversely, the country's NEP includes aspirations to increase renewable energy capacity and promote a low-carbon economy, particularly through strategies like enhancing energy efficiency across various sectors and transitioning to renewable energy sources.

Currently, Malaysia's renewable energy share is 23%, as reported in the Malaysia Renewable Energy Roadmap (2020). The NETR has set a national target to achieve a 70% renewable energy share by 2050. This represents a significant effort toward tripling the current renewable energy share over the long term, even though no explicit target for tripling renewable energy by 2030 is specified in Malaysia's policies.

The policy focuses on increasing renewable energy usage and improving energy management but lacks concrete strategies or explicit goals that directly align with tripling renewable energy capacity by 2030. While it contributes to the growth of renewable energy, it does not provide specific strategies aimed at achieving this within the 2030 timeframe, leading to the answer of "Partially Yes".

The rationale for using the global target of tripling renewable energy capacity as a criterion is rooted in the Global Stocktake (GST) process, which offers a valuable opportunity for Malaysia to assess its progress and determine the way forward. Malaysia has committed to a net zero target in line with the Paris Agreement's goals, making it beneficial to explore how its policies align with global benchmarks like the RE tripling target.

5.2.1.2 General Renewable Energy

Table 7: General Renewable Energy

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on renewables?	Yes	Yes	Yes	Yes	Yes

The NDC highlights various measures to promote renewable energy. Under the 12MP, key initiatives include the promotion of renewable energy technologies such as cogeneration, solar thermal, and fuel

cells. The introduction of the Renewable Energy Certificate system aims to facilitate the procurement and trading of renewable energy. Other measures include encouraging the development of floating solar and waste-to-energy projects, alongside providing Energy Audit Conditional Grants for industrial and commercial sectors. Additionally, PETRONAS has committed to achieving net zero carbon emissions by 2050 through investments in low-carbon energy solutions, zero-carbon fuels and nature-based solutions.

The NETR further expands on these efforts by proposing solar parks, floating solar, and agrivoltaic technology. It also promotes the virtual aggregation model for rooftop solar installations. Key initiatives within the NETR include flagship catalyst projects, large-scale solar developments, regional renewable energy trading, and the integration of smart grid features to modernise the national power grid. Under the NEP, specific strategies focus on increasing the share of renewable energy, adopting large-scale energy storage solutions, and implementing pilot programmes for hydrogen and next-generation bioenergy technologies.

5.2.1.3 Targets

Table 8: Targets for Renewable Energy

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents define targets for renewables?	No	Yes	Yes	Yes	Yes

While Malaysia's NDC does not specify renewable energy targets, other national policies provide clear goals. Under the 12MP, the country aims to achieve 31% of total installed capacity from renewable energy by 2025. The NETR extends this ambition, targeting 70% renewable energy capacity in the power mix by 2050, with these targets expressed as a percentage of total installed capacity and according to the NETR, represent absolute capacity values to be achieved over time.

5.2.2 Energy Efficiency

5.2.2.1 Doubling Energy Efficiency

Table 9: Doubling Energy Efficiency

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information aligned with and/or contributing to doubling the global average annual rate of energy efficiency improvements by 2030?	No	No	No	Partially Yes	Partially Yes

Malaysia's NDC does not explicitly mention the goal of doubling the global average annual rate of energy efficiency improvements by 2030. However, the NEP highlights the importance of enhancing energy efficiency across sectors such as industrial, residential, and commercial. While the NEP promotes energy efficiency and sustainable practices, it does not set specific targets or metrics aligned with the goal of doubling the global rate of energy efficiency improvements by 2030. Thus, despite a clear commitment to improving energy efficiency, the lack of a defined doubling target leads to a "Partially Yes" classification.

5.2.2.2 General Energy Efficiency

Table 10: General Energy Efficiency

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy document include any information on general energy efficiency policies?	No	Yes	Yes	Yes	Yes

The NDC does not specifically mention general energy efficiency policies. However, other policy documents, such as the 12MP, outline key measures, including the introduction of the Energy Efficiency and Conservation Act, the expansion of Minimum Energy Performance Standards (MEPS), the National Building Energy Intensity programme, and initiatives like Energy Audit Conditional Grants and retrofitting government buildings for energy efficiency.

The NETR further emphasises energy efficiency with initiatives such as improving MEPS, mandatory energy audits for large buildings, green building codes, and establishing energy service companies. These efforts target reducing energy consumption and improving efficiency across the residential, commercial and industrial sectors, alongside the promotion of energy-efficient appliances and retrofitting programmes. The NEP builds on these efforts by enforcing the Energy Efficiency and Conservation Act (EECA), expanding energy audits and MEPS, and enhancing demand-side management in both industrial and residential sectors. The NEP also supports scaling up demand-side management initiatives by strengthening enabling policies and frameworks.

5.2.2.3 Switching to Efficient Fuel

Table 11: Switching to Efficient Fuel

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on switching to more efficient fuels?	No	Yes	Yes	Yes	Yes

The NDC does not include information on switching to more efficient fuels. However, other policy documents like the 12MP highlight initiatives to promote low-carbon energy sources such as natural gas and renewable energy, which are more efficient and have lower emissions than traditional fossil fuels. It also emphasises the expansion of electric vehicles (EVs) and the development of necessary charging infrastructure. Additionally, partnerships to promote clean energy technologies, such as solar projects and waste-to-energy programmes, are mentioned, aligning with the goal of reducing reliance on fossil fuels and promoting cleaner energy sources.

The NETR builds on this with measures like incentives for EV adoption, development of charging infrastructure, and the promotion of clean cooking technologies. It also details pilot projects for EVs, private sector partnerships to advance clean energy, and campaigns encouraging the switch to more efficient fuels. The NEP further supports these efforts by offering government incentives to attract investment in low-carbon technologies, including renewable energy, energy storage, low-carbon mobility, and hydrogen. The NEP also focuses on adopting digital technologies to enhance energy efficiency and seizing opportunities in biofuels for the marine and aviation sectors, as well as pilot programmes for hydrogen and next-generation bioenergy.

5.2.2.4 Technical Efficiency

Table 12: Technical Efficiency

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on improving technical efficiency?	No	Yes	Yes	Yes	Yes

The NDC does not include specific information on improving technical efficiency. However, other policy documents address this area extensively. The 12MP outlines several measures, such as promoting energy-efficient building designs, retrofitting buildings, expanding Minimum Energy Performance Standards (MEPS), and encouraging the adoption of electric vehicles (EVs). It also includes initiatives like Energy Audit Conditional Grants for industries, retrofitting government buildings through Energy Performance Contracting, and promoting energy-efficient appliances via MEPS.

The NETR further focuses on improving technical efficiency across sectors, with initiatives like promoting energy-efficient appliances, enforcing green building codes, and implementing mandatory energy audits for large buildings.

The NEP supports a step change in industrial energy efficiency through the enforcement of the Energy Efficiency and Conservation Act (EECA), energy audits and MEPS. It also aims to enhance demand-side management in industrial, residential and commercial sectors, and scale up these initiatives with the support of digital and smart technologies linked to the Fourth Industrial Revolution.

5.2.2.5 Efficient Energy and Material Use in NDC/Policies

Table 13: Efficient Energy and Material Use

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on using energy and materials more efficiently to avoid demand?	No	Yes	Yes	Yes	Yes

The NDC does not mention using energy and materials more efficiently to avoid demand. However, the 12MP highlights several initiatives, such as improving energy efficiency in buildings, increasing the use of recycled materials, enhancing material efficiency in industry, promoting energy-efficient appliances, and encouraging sustainable industrial practices. It also includes incentives for industries to adopt efficient production processes, recycling initiatives and pilot projects on energy efficiency, as well as public campaigns promoting resource efficiency, public transport and active travel.

The NETR focuses on energy efficiency with measures like public awareness programmes, revised 5-star labelling standards, and mandatory energy audits for large buildings. It also mentions the Energy Efficiency and Conservation Act (EECA) to regulate energy-intensive users, energy retrofits in government buildings, and green building codes for residential and commercial properties. Additionally, the NETR promotes green mobility, electric vehicle adoption and public transport to reduce demand in the transport sector.

The NEP supports these efforts by offering government incentives to attract investments in low-carbon technologies like renewable energy, energy storage and low-carbon mobility. It also focuses on enhancing demand-side management across industrial, residential and commercial sectors to scale up resource efficiency efforts.

5.2.3 Net Zero Emission Energy Systems

5.2.3.1 Efforts Towards Net Zero Emission Energy Systems

Table 14: Efforts Towards Net Zero Emission Energy Systems

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on accelerating efforts towards net zero emission energy systems?	No	Yes	Yes	Yes	Yes

The NDC does not explicitly address accelerating efforts towards net zero emission energy systems. However, other policy documents provide significant direction. The 12th Malaysia Plan (12MP) introduces key instruments for climate action, including the development of an NDC roadmap, long-term low-emission strategies, and feasibility studies on carbon pricing, such as carbon tax and the Emission Trading Scheme (ETS). It also highlights private sector initiatives, like PETRONAS's efforts to reduce hydrocarbon flaring, capture methane emissions and invest in nature-based solutions. Additionally, the plan promotes green market expansion and government green procurement.

The NETR emphasises the critical role of Carbon Capture, Utilisation and Storage (CCUS) in achieving net zero emissions. It outlines measures for accelerating the energy transition, including adopting cleaner energy alternatives like solar, wind, and EVs. The NETR is essential for Malaysia's shift from a fossil fuel-based economy to a green economy, targeting net-zero GHG emissions by 2050.

The NEP supports this transition through specific targets, such as increasing the share of renewable energy in the energy mix, reducing coal dependency and enhancing energy efficiency. It also includes pilot projects for hydrogen production, partnerships for EV infrastructure and incentives for low-carbon technologies.

5.2.3.2 Use of Zero and Low Carbon Fuels

Table 15: Use of Zero and Low Carbon Fuels

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on the use of zero- and low-carbon fuels?	No	Yes	Yes	Yes	Yes

The NDC does not address the use of zero- and low-carbon fuels. However, the 12MP outlines initiatives such as expanding the B20 biodiesel programme (20% palm methyl ester) nationwide and introducing the B30 programme to increase biofuel usage. It also promotes alternative fuel sources like compressed natural gas, hydrogen and fuel cells, while encouraging green vehicles for public transport and logistics, and shifting freight transport from road to rail.

The NETR sets a target of 40% low-carbon fuel penetration in marine transport by 2050, in line with the International Maritime Organisation's (IMO) decarbonisation efforts. As a result, the previous target of 25% LNG penetration in marine transport has been dropped.

The NEP also aims to increase the use of alternative fuels, including biofuels and hydrogen, in the transport sector. It outlines measures to develop infrastructure, provide incentives for adoption, and invest in research and development. The NEP includes pilot projects for hydrogen production, partnerships for biofuels and campaigns to promote alternative fuel use in transport.

5.2.4 Non-CO_2 emissions

5.2.4.1 Methane, CH_4

Table 16: Methane, CH_4

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on reducing methane (CH_4) emissions?	Partially Yes	Yes	No	No	Yes

While Malaysia's NDC partially addresses methane (CH_4) emissions by including CH_4 among the seven GHGs covered, it does not specify detailed targets or reduction measures. In contrast, the 12MP commits to phasing down methane emissions by 2030, with PETRONAS aiming for net zero carbon emissions by 2050. PETRONAS will implement initiatives such as reducing hydrocarbon flaring and venting, capturing methane emissions, and optimising operations. However, neither the NETR nor the NEP include specific targets for CH_4 reduction, instead focusing on broader GHG reduction efforts without addressing all categories in detail.

5.2.4.2 Timelines for Methane, CH_4

Table 17: Timelines for Methane, CH_4

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents set specific timelines for reducing methane emissions?	Partially Yes	Yes	No	No	Yes

The NDC sets specific timelines for reducing methane emissions by 2030. Additionally, the 12MP outlines Malaysia's goal of reducing its GHG emissions intensity to GDP by 45% by 2030, compared to 2005 levels, which includes methane reduction initiatives led by PETRONAS and other entities. However, the NETR and the NEP do not specify timelines or targets for CH_4 reduction.

5.2.4.3 Nitrous Oxide, N_2O

Table 18: Nitrous Oxide, N_2O

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on reducing nitrous oxide (N_2O) emissions?	Partially Yes	No	No	No	Partially Yes

While the NDC partially addresses nitrous oxide (N_2O) emissions by including N_2O among the seven GHGs covered, it does not specify detailed targets or reduction measures. In contrast, the 12MP, NETR, and NEP do not include specific information on reducing emissions of these gases.

5.2.4.4 Timeline for Nitrous Oxide, N_2O

Table 19: Timeline for Nitrous Oxide, N_2O

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents set specific timelines for reducing N_2O emissions?	Partially Yes	No	No	No	Partially Yes

The NDC sets specific timelines for reducing N_2O emissions by 2030. However, the 12MP, NETR, and NEP do not include specific timelines on reducing emissions of N_2O emissions.

5.2.4.5 Hydrofluorocarbons, HFCs

Table 20: Hydrofluorocarbons, HFCs

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents set specific timelines for reducing HFCs emissions?	Partially Yes	Yes	No	No	Yes

The NDC partially addresses the reduction of HFC emissions, as it includes hydrofluorocarbons (HFCs) among the seven GHGs covered, but does not specify detailed targets or measures for reduction. In contrast, the 12MP explicitly commits to phasing down HFCs by 2030, following the ratification of the Kigali Amendment to the Montreal Protocol. However, the NETR and the NEP do not mention specific timelines or targets for reducing HFCs, as they focus more broadly on GHG emissions reduction without explicit reference to all categories, including HFCs.

5.2.4.6 Timeline for Hydrofluorocarbons, HFCs

Table 21: Timeline for Hydrofluorocarbons, HFCs

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents set specific timelines for reducing HFCs emissions?	Partially Yes	Yes	No	No	Yes

The NDC partially addresses hydrofluorocarbon (HFC) emissions and specifies a timeline for their reduction by 2030. The 12MP sets a clear timeline to phase down HFCs by 2030, following the Kigali Amendment to the Montreal Protocol. Neither the NETR nor the NEP provides specific timelines for HFC reductions.

5.2.4.7 Other Gases

Table 22: Other Gases

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on reducing other gas emissions?	Partially Yes	No	No	No	Partially Yes

The NDC partially addresses the reduction of emissions from other gases, such as perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3), but does not provide detailed targets or measures for these specific gases. In contrast, the 12MP, NETR, and NEP do not include specific information on reducing emissions of these gases.

5.2.4.8 Timeline for Other Gases

Table 23: Timeline for Other Gases

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents set specific timelines for reducing other gas emissions?	Partially Yes	No	No	No	Partially Yes

The NDC outlines a time frame for implementation from 1 January 2021 to 31 December 2030. During this period, the focus includes setting and achieving targets related to reducing emissions of various GHGs, including perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). However, specific timelines for reducing these gases are not explicitly detailed in the NDC, nor are specific timelines for these gases provided in other key policy documents such as the 12MP, NETR and NEP.

5.3 Transport

5.3.1 Transport Sector

Table 24: Transport Sector

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on reducing emissions from the transport sector?	Yes	Yes	Yes	Yes	Yes

Malaysia's NDC outlines broad policies for reducing emissions across various sectors, including transport, as part of a broader goal of reducing economy-wide carbon intensity. Complementing this, the 12MP focuses on promoting green vehicles, expanding biodiesel programmes, and shifting freight transport from road to rail to mitigate emissions. The NETR further supports these goals with specific targets for electrification and biofuels, aiming to enhance public transport's modal share and accelerate the adoption of electric vehicles. Additionally, the NEP emphasises increasing electric vehicle penetration, improving fuel economy, and developing infrastructure to support low-carbon mobility. Collectively, these documents provide a comprehensive framework for addressing emissions in the transport sector through targeted policies and initiatives.

5.3.2 Targets

Table 25: Targets

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents define qualitative targets for the transport sector?	No	Yes	Yes	Yes	Yes

The NDC does not define specific qualitative targets for the transport sector, whereas targets are defined in the 12MP, NETR and NEP. The 12MP targets are intended to increase electric vehicle adoption, thereby boosting the share of public transport to 40% in Greater Kuala Lumpur/Klang Valley, as well as scaling up biodiesel use. The NETR aims to achieve a 60% public transport share, 80% penetration of electric vehicles and two-wheelers by 2050, and sets goals for rail freight, aviation and marine transport. The NEP focuses on achieving net zero emissions by 2050, increasing EV penetration, and promoting alternative fuels like LNG for marine transport.

5.4 Forests

5.4.1 Deforestation and Forest Degradation

Table 26: Deforestation and Forest Degradation

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents include any information on halting and reversing deforestation and forest degradation?	Partially Yes	Partially Yes	No	No	Partially Yes

The overall response to whether Malaysia's NDC and other policy documents include information on halting and reversing deforestation and forest degradation is "Partially Yes." The NDC discusses the preservation of vulnerable terrestrial and marine ecosystems, including the expansion of protected areas and improved management of terrestrial ecosystems, such as increasing riparian area management units and reserving larger buffer areas around wetlands, peat swamps and mangroves. However, it does not explicitly commit to entirely halting and reversing deforestation and degradation. The 12MP supports this with initiatives like the implementation of the REDD Plus Mechanism, forest restoration and rehabilitation, the establishment of ecological corridors, and engaging state governments to ensure better forest conservation practices. In contrast, the NETR and NEP do not include specific provisions for addressing deforestation or forest degradation, focusing instead on energy-related policies. Therefore, the most accurate assessment is that these efforts are "Partially Yes," reflecting both the existing initiatives and the need for more explicit commitments.

5.4.2 Timelines

Table 27: Timelines

Item	Policy Documents				
	NDC	12MP	NETR	NEP	Overall
Does NDC or other policy documents set specific timelines for these goals?	Partially Yes	Partially Yes	No	No	Partially Yes

The NDC does set specific timelines, including an implementation period from 2021 to 2030, for addressing deforestation and forest degradation, while the 12th Malaysia Plan (12MP) further supports this by committing to maintain at least 50% of Malaysia's land as forest cover, plant 100 million trees, and conserve significant portions of terrestrial, inland and coastal areas by 2025. Currently, Malaysia's forest coverage stands at 55.1%, according to data from 2018 and 2019, which exceeds the 50% target. However, ongoing deforestation activities must be addressed to genuinely reverse deforestation trends. The NETR and NEP do not include specific timelines for these goals, making the overall timeline setting "Yes," primarily due to the NDC's 2030 and the 12MP's 2025 targets.

5.5 Adaptation

Malaysia does not yet have a National Adaptation Plan (NAP), but the Fourth National Communication (NC4), submitted to the UNFCCC this year as the country's Adaptation Communication, provides comprehensive insights into the country's ongoing efforts to address climate adaptation across key sectors.

5.5.1 Enhancing Adaptive Capacity, Resilience and Reducing Vulnerability

Table 28: Enhancing Adaptive Capacity, Resilience and Reducing Vulnerability

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on enhancing adaptive capacity, strengthening resilience, and reducing vulnerability?	Yes	Yes

The Fourth National Communication (NC4) of Malaysia includes information on key elements of climate adaptation, such as enhancing adaptive capacity, strengthening resilience and reducing vulnerability. It emphasises the importance of these elements through systematic vulnerability assessments and adaptation strategies in response to climate change impacts. Specific actions are outlined across critical sectors, including Integrated Water Resources Management (IWRM) for water security, climate-resilient agriculture, and ecosystem protection measures such as mangrove conservation and coral reef restoration. The NC4 also highlights the importance of integrated management approaches, such as IWRM and Integrated River Basin Management (IRBM), to ensure the sustainable use of natural resources. Additionally, it includes long-term plans such as the National Climate Change Policy and Water Sector Transformation 2040, alongside infrastructure upgrades for flood protection, dam security and real-time monitoring systems, ensuring that adaptation efforts are well-integrated and contribute to improving Malaysia's overall climate resilience.

5.5.2 The Critical Role of Monitoring and Evaluation in Adaptation

Table 29: The Critical Role of Monitoring and Evaluation in Adaptation

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on monitoring and evaluation?	Yes	Yes

The NC4 emphasises the critical role of monitoring and evaluation in adaptation. It includes systems such as the National Water Balance Management System for tracking water availability during extreme weather events and addressing gaps in data collection and analysis. In the forestry sector, the NC4 outlines monitoring programmes for early detection of forest fires and peatland conditions, using tools like the Fire Weather Index and hotspot monitoring systems. Additionally, the NC4 highlights the importance of dam safety through MyDAMS guidelines, hydrological and groundwater monitoring, integrated shoreline management plans, coral reef health, public health (WASH FIT) and energy sector resilience, providing a comprehensive approach to adaptation monitoring across various sectors.

5.5.3 User-driven Climate Services to Boost Adaptation

Table 30: User-driven Climate Services to Boost Adaptation

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on user-driven climate services systems, including early warning systems?	Yes	Yes

The NC4 emphasises the country's commitment to enhancing user-driven climate service systems, particularly through the development of early warning systems. Notable initiatives include the National Flood Forecasting and Warning Programme, which provides early warnings for monsoon floods, and the installation of telemetric rainfall and river water level stations to improve flood forecasting. Additionally, the NC4 highlights the identification of 5,496 flood hotspots, the implementation of sabo structures to mitigate debris floods, and the Hydrological Monitoring Programme, all of which strengthen Malaysia's ability to adapt to climate impacts. These measures enhance community preparedness and resilience against extreme weather events, ensuring effective climate adaptation.

5.5.4 Urgent, Country-driven Adaptation Based on National Circumstances

Table 31: Urgent, Country-driven Adaptation Based on National Circumstances

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on urgent, incremental, transformational and country-driven adaptation?	Yes	Yes

The NC4 addresses urgent, incremental, transformational and country-driven adaptation actions. Urgent actions include relocating flood-prone healthcare facilities and installing flood walls around substations. Incremental actions focus on enhancing agricultural techniques, such as modified wetting and drying in rice production, and improving flood forecasting systems. Transformational actions include policies like the National Climate Change Policy and ecosystem programmes like the Central Forest Spine and Heart of Borneo to build long-term resilience. Country-driven adaptation is emphasised through the development of national strategies, including the National Agrofood Policy 2021–2030 and the revised Malaysian Sustainable Palm Oil Standards, demonstrating Malaysia's commitment to enhancing resilience across various sectors.

5.5.5 Transboundary Risks

Table 32: Transboundary Risks

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on transboundary risks?	Partially Yes	Partially Yes

The NC4 describes measures for addressing transboundary risks, recognising their complex and cascading nature due to climate change. It mentions the importance of international cooperation and

knowledge-sharing to address these risks, particularly in flood management and climate resilience. Specific actions include the development of a multi-hazard platform for forecasting climate extremes in Iskandar Malaysia with international technical assistance. However, while these measures are described for certain sectors like water management and public health, the document does not provide a comprehensive or detailed plan for addressing transboundary risks across all sectors, which is why the answer is "Partially Yes".

5.5.6 Long-term Planning and Swift Adaptation Implementation by 2025

5.5.6.1 Long-term Planning

Table 33: Long-term Planning

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on long-term planning?	Partially Yes	Partially Yes

Malaysia's NC4 includes information on long-term adaptation planning, primarily within specific sectors. It highlights policies and frameworks like the National Policy on Climate Change and the National Water Policy, focusing on sustainable and integrated resource management. Notable long-term action plans include the Fourth National Physical Plan 2021–2040 (NPP4), which integrates climate change considerations into urban and spatial planning, and the Water Sector Transformation 2040, which outlines long-term strategies for water resource management. Additionally, projects such as the Rasau Water Supply Scheme and the HORAS 3000 project are designed to ensure sustainable water resources through significant financial commitments.

While these plans provide important long-term strategies for individual sectors, they do not collectively represent a comprehensive, nationwide adaptation strategy covering all sectors in an integrated manner.

5.5.6.2 Timelines

Table 34: Timelines

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents set specific timelines for implementing adaptation actions?	Partially Yes	Partially Yes

The NC4 outlines specific timelines for implementing adaptation actions across various sectors, contributing to the nation's broader adaptation goals. For instance, by 2025, the government aims to reduce Non-Revenue Water (NRW) loss from 35% to 25% and lower domestic water consumption from 205 to 180 litres per capita per day. By 2030, NRW loss is targeted to decrease further to 20%, and domestic water consumption is expected to reach 160 litres per capita per day. Additionally, the National Agrofood Policy 2021–2030 sets strategies for sustainable agriculture and food security by 2030. Long-term plans such as the Water Sector Transformation 2040 and the Fourth National Physical Plan 2021–2040 (NPP4) outline objectives for water management and urban planning through to 2040.

While these timelines are primarily sector-specific, they form a crucial part of Malaysia's overall adaptation efforts. Therefore, the answer is "Partially Yes", as the timelines focus on specific sectors rather than a single, overarching national adaptation plan.

5.5.7 Adaptation Cycle

Table 35: Adaptation Cycle

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on adaptation cycles?	Partially Yes	Partially Yes

The NC4) includes information on adaptation cycles, describing actions involved in each step of the process, including risk assessment, planning, implementation, monitoring and evaluation. For water and coastal resources, it outlines assessments of vulnerability and impacts due to climate change, providing projections for future conditions. It also details adaptation measures such as integrated water management systems and national policies. In the agriculture and food security sector, the NC4 highlights climate impacts on crop production and offers adaptation strategies, including the development of climate-resilient crops, improved water management practices and disaster risk reduction measures. However, while these steps are addressed, the documents do not consistently provide specific targets or comprehensive plans for each step of the adaptation cycle across all sectors.

5.5.8 Integrated, Multi-sectoral Solutions for Sustainable Adaptation

Table 36: Integrated, Multi-sectoral Solutions for Sustainable Adaptation

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include information on nature conservation, including land use, sustainable agriculture, resilient food systems, nature-based solutions, ecosystem-based approaches, mountain ecosystems, coastal ecosystems, etc.?	Partially Yes	Partially Yes

The NC4 mentions various approaches related to nature conservation, including actions on water and coastal resources, agriculture and forestry. For water and coastal resources, it details initiatives like mangrove reforestation, coastal protection projects and the integrated shoreline management plan, using nature-based solutions to restore natural buffers against coastal flooding and erosion. In agriculture, it describes sustainable practices such as developing climate-resilient crop varieties, integrated pest management, and promoting sustainable land use practices, all contributing to resilient food systems and enhanced food security. In forestry and biodiversity, the NC4 highlights efforts in reforestation, afforestation and protecting ecosystem services, underlining the role of forests in climate adaptation and mitigation. However, the NC4 does not mention gender responses or Indigenous local knowledge approaches to these conservation efforts.

5.5.9 Targets

Table 37: Targets

Item	Policy Document	
	NC4	Overall
Does NAP or other adaptation documents include actions related to the following targets?	Partially Yes	Partially Yes

The NC4 outlines specific adaptation targets across key sectors in Malaysia. For water resilience, it focuses on reducing NRW and domestic water consumption, with measurable targets under the National Water Policy (NWP) and National Physical Plan 2021–2040. In agriculture, the National Agrofood Policy 2021–2030 aims to develop climate-resilient crops and increase the rice self-sufficiency level (SSL) to 80% by 2030. The healthcare sector targets relocating facilities from flood-prone areas and improving water and sanitation systems. Ecosystem-based adaptation is prioritised through mangrove reforestation, coral reef restoration and integrated coastal management. Infrastructure resilience is enhanced by flood management plans and sustainable urban planning. However, explicit targets for poverty eradication, adaptive social protection and the protection of cultural heritage are not mentioned.

6

Discussion

6.1 Findings of the assessment

6.1.1 Mitigation

The assessment of Malaysia's national climate mitigation policies shows an overall strong to medium alignment level, with varied levels of alignment when it comes to different policy documents reviewed. The NDC in 2021 demonstrates limited alignment, with a rating of "Yes" to four out of twenty-five (25) questions (see Figure 4 below). While the NDC covers essential GHGs, it focuses on emission intensity reductions rather than absolute reductions. This approach allows Malaysia, as a developing country, to continue its economic growth while reducing emissions relative to GDP. However, this reliance on emission intensity reductions weakens the NDC's long-term impact on emission reductions. Additionally, the NDC does not show enough coverage of sectoral mitigation efforts beyond energy, including critical areas such as forestry, which further limits its scope.

On the other hand, the 12MP shows the strongest alignment, with a "Yes" rating to 15 out of 25 questions. It includes comprehensive targets for renewable energy and energy efficiency, despite lacking detailed timelines for non-CO_2 gas reductions, thereby limiting its full alignment with the outcome of GST1.

The NETR, while primarily focused on energy, performs better than the NEP. The NETR, with "Yes" ratings to 11 questions out of 25, addresses transport decarbonisation through initiatives like public transport electrification and biofuels. In contrast, the NEP, with ten "Yes" ratings, has a narrower focus and lacks the NETR's depth in transport.

Despite some progress, all policies exhibit clear gaps. The NDC received eleven "No" ratings, reflecting the absence of absolute reduction targets and limited sectoral integration. Similarly, the 12MP, NETR and NEP received "No" ratings in several areas due to a lack of clear timelines and broader sectoral coverage. Partial progress is noted in the NDC, which received 10 "Partially Yes" ratings, while the 12MP recorded only two. Both the NETR and NEP show minimal partial progress, remaining focused on energy and transport and lacking information on sectors like forestry, which are critical for climate mitigation.

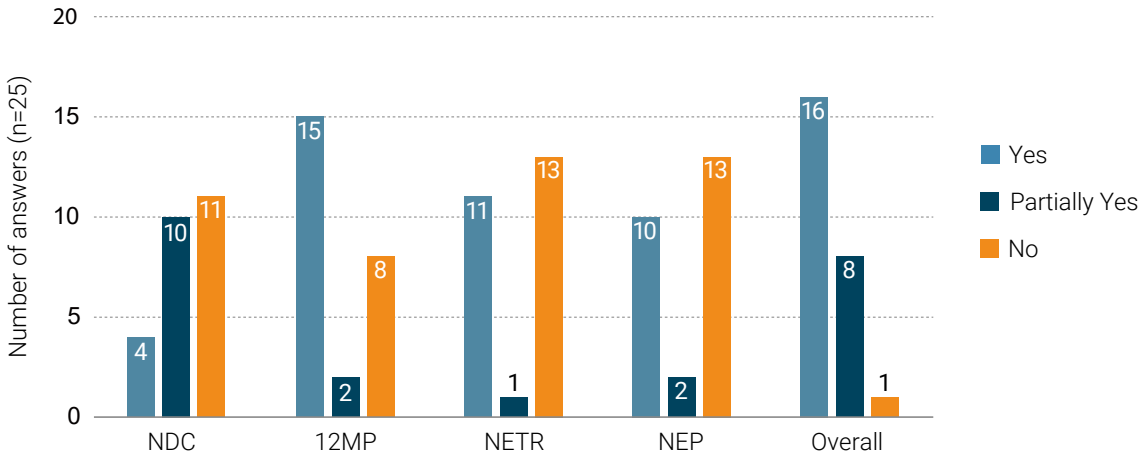

Figure 1: Summary of the assessment results for mitigation

6.1.2 Adaptation

The assessment of Malaysia's adaptation efforts shows medium alignment with the outcome of GST1, notably through the NC4 document. As shown in Figure 5, out of the 10 questions assessed, four received a "Yes" rating, while six were rated "Partially Yes." The NC4 document covers critical areas such as enhancing adaptive capacity, building resilience and reducing vulnerability to climate impacts across key sectors, including water resources, agriculture and public health.

The NC4 emphasises integrated management approaches, IWRM and IRBM, which are essential for adapting to the impacts of climate change on water resources. In addition, the document outlines specific strategies to strengthen early warning systems and improve monitoring and evaluation mechanisms, ensuring the country is better prepared for extreme weather events and long-term climate risks.

Furthermore, the NC4 addresses both urgent and transformational adaptation needs. Initiatives such as enhancing flood protection infrastructure, promoting climate-resilient agricultural practices and strengthening public health systems demonstrate the government's commitment to protecting vulnerable populations. However, adaptive social protection is only partially covered, and cultural heritage protection from climate-related risks is not addressed.

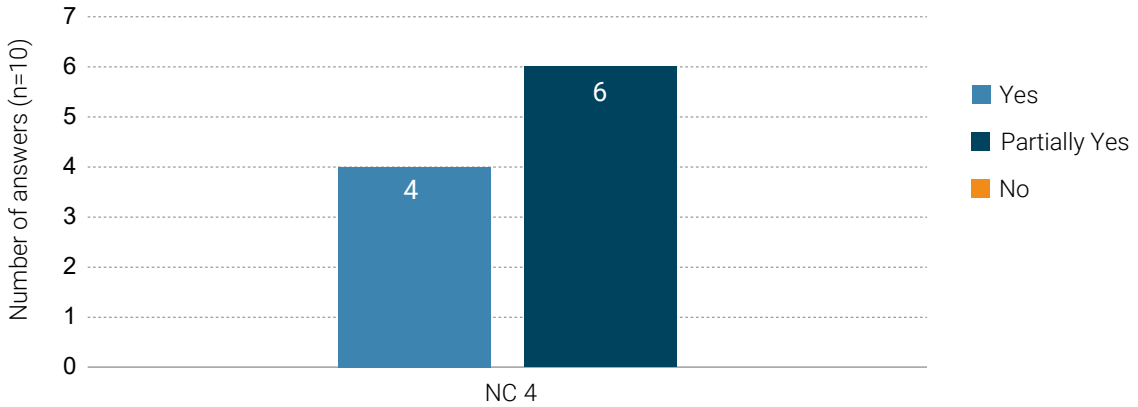

Figure 2: Summary of the assessment results for adaptation

6.2 Policy recommendations

Looking ahead towards the update of Malaysia's NDC based on the outcome of GST1, this section presents some recommendations for Malaysia's climate policies and the second GST (GST2) of the Paris Agreement.

1. ***Strengthening Malaysia's NDC with Existing Policies Can Boost Alignment with the Outcome of GST1***

   Some of Malaysia's national climate policies reviewed in this study, such as 12MP, NETR and NEP, align with several future directions or milestones as indicated in the outcome of GST1. However, this assessment shows these policies are not fully incorporated into the current NDC, which exhibited limited alignment. Simply including these and other existing policies in the next NDC can instantly strengthen Malaysia's alignment with the outcome of GST1.

   It should be noted that countries demonstrating a strong alignment with the GST1 outcome, including through the integration of current policies, are likely to benefit from increased international support, such as financial resources and technology transfer. By taking a holistic approach to its next NDC submission, Malaysia can fully capitalise on these opportunities while advancing both its national and international climate goals.

2. ***Addressing Gaps in Renewable Energy, Energy Efficiency, Non-CO_2 Gases and Forest Targets***

   Malaysia's current NDC and national climate policies fall short in several areas, including the global goals of tripling renewable energy capacity and doubling energy efficiency, as highlighted in the outcome of GST1. Similarly, non-CO_2 gases and forest management, particularly concerning deforestation and forest degradation, also signaled room for improvement in these critical areas.

   To address these gaps, Malaysia needs targeted actions across all four domains as shown in this assessment: renewable energy, energy efficiency, non-CO_2 gases, and forests. Focusing on these areas is crucial for both environmental and economic reasons. Strengthening policies in renewable energy, energy efficiency, non-CO_2 gases, and forest management will not only reduce Malaysia's carbon footprint but also enhance energy security, create jobs and boost innovation in green technologies. Moreover, improving these areas will bolster Malaysia's credibility in international climate negotiations, opening doors for collaboration, climate finance and technology transfers.

3. ***Aligning NEP and NETR for a Unified Climate and Energy Strategy***

   The assessment shows that the NEP and NETR set different targets, creating challenges in ensuring coherence and consistency in the country's overall climate strategy. The NEP, introduced to promote a low-carbon economy up to 2040, laid the groundwork for transitioning Malaysia's energy sector toward sustainability. The NETR, introduced later, serves as a continuation and enhancement of the NEP, building on its foundation to accelerate energy transition efforts. However, the policies were developed by different ministries, reflecting diverse approaches and priorities. This fragmentation can result in an inconsistent and disjointed climate agenda.

To address these challenges, Malaysia is taking steps to foster greater policy coherence. The Climate Change Action Council (MyCAC) is now the highest decision-making body in the country for discussing and setting the direction of climate change policies and actions (National Climate Change Policy (NCCP) 2.0, 2024). MyCAC facilitates coordination and cooperation between the Federal Government and state administrations, fostering stronger and more streamlined climate action. According to Malaysia's BUR4 and the forthcoming NCCP 2.0, efforts are underway to ensure that policies like the NEP, NETR and future climate policies are not developed in isolation but are interwoven under an integrated framework.

The Ministry of Natural Resources, Environment, and Climate Change (NRES) is currently finalising Malaysia's NDC roadmap and other plans to guide policy implementation. These efforts are part of a broader attempt under NCCP 2.0 to align all climate and energy strategies. By doing so, Malaysia seeks to synchronise targets and ensure policy coherence across sectors, amplifying the effectiveness of individual policies.

To further enhance coherence, it is essential to strengthen the role of MyCAC and ensure it functions effectively as a platform for reconciling differences between policies and fostering integration. Achieving policy coherence between the NEP and NETR is crucial for balancing Malaysia's energy transition with its economic and social needs.

An integrated approach ensures that Malaysia's climate and energy strategies are both ambitious and pragmatic, enabling the country to pursue a just and equitable energy transition while minimising disruption to key industries and livelihoods. This alignment positions Malaysia to achieve long-term climate resilience and demonstrate leadership in global climate action.

4. *Advancing the Outcome of GST2 for Adaptation*

The final recommendation is for the GST2 to be conducted between 2026 and 2028. This assessment reveals that the outcome of GST1 for adaptation does not provide as specific and ambitious directions or milestones as for mitigation. The outcome of GST1 for adaptation lists the number of important topics and issues that need to be considered. However, it does not often contain specific targets or timelines for countries to follow along with their NDCs. The outcome of the GST needs to firmly inform countries in updating and enhancing NDCs or adaptation policies and strategies. Its role as the global benchmark for adaptation needs to be strengthened in the GST2. This can provide another critical opportunity for countries to assess their adaptation efforts against the global benchmark and implement more robust, proactive strategies to ensure long-term resilience in the face of escalating climate risks.

6.3 Future research

In future research, extending the assessment to include non-energy sectoral policies is essential for providing a more comprehensive view of Malaysia's climate mitigation efforts. This expansion could encompass a detailed review of policies targeting key sectors such as industry, agriculture, forestry and waste management. By analysing the current and potential policies within these areas, the broader impacts of Malaysia's climate strategies can be better understood, and areas where more targeted interventions may be needed can be highlighted to achieve long-term mitigation goals.

Furthermore, it would be highly beneficial to gather feedback from Malaysia's climate policymakers regarding the recommendations proposed in this assessment. Engaging directly with policymakers would provide valuable insights into the practicality, relevance and alignment of the recommendations with the government's ongoing efforts in climate action. This feedback loop would allow for iterative improvements to the recommendations, ensuring they are responsive to current policy needs and more effectively support the development, revision, and implementation of national climate policies, including Malaysia's next NDC. By fostering close collaboration with policymakers, future research can enhance the strategic alignment of climate policies with the goals outlined in the Paris Agreement, thereby supporting Malaysia's commitment to global climate targets.

7

Conclusions

The assessment of the alignment of Malaysia's national climate policies with the outcome of GST1 highlights both progress and areas for improvement. While the country has made strides in updating its NDC and addressing key sectors like energy, gaps remain in fully aligning with global climate goals.

To strengthen alignment with the GST1 outcome, Malaysia should focus on expanding its climate mitigation policy scope, setting more ambitious targets, and ensuring stronger coordination between its various energy policies. Malaysia's adaptation strategies indicate that efforts are certainly being made, particularly in enhancing resilience and managing risks, but there is a need for more ambitious and comprehensive actions across all sectors.

This would enhance the country's contribution to global efforts while positioning it to access greater international cooperation and funding. Ultimately, while Malaysia has made notable progress, further enhancements in both mitigation and adaptation strategies are essential to meet the long-term objectives of the Paris Agreement.

Appendix

01. Malaysia NDC (submitted in 2021)

a. Mitigation Overview

	Questions	National Climate Policy		
		Yes	Partially Yes	No
Reflection of the GST1 outcome	The next round of NDCs are encouraged to cover ambitious, economy-wide emission reduction targets, covering all greenhouse gases, sectors and categories and aligned with limiting global warming to 1.5 °C. Developed countries should continue taking the lead by undertaking economy-wide absolute emission reduction targets, and developing countries should continue enhancing their mitigation efforts and are encouraged to move over time towards economywide emission reduction or limitation targets in the light of different national circumstances.			
Q1	Does NDC or other policy document cover the following greenhouse gases (*carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases - hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3)?	/		
Q2	Does NDC or other policy document cover the following sectors (*energy, Industrial Processes and Product Use (IPPU), agriculture, Land Use, Land-Use Change and Forestry (LULUCF), and waste)?	/		
Q3	Does NDC or other policy document set an absolute emission reduction target?			/

b. Mitigation Energy

	Questions	National Climate Policy		
		Yes	Partially Yes	No
Reflection of the GST1 outcome	1. Governments agreed to triple global renewable energy capacity by 2030.			
1-1	Does NDC or other policy document include any information aligned with and/or contributing to tripling global renewable energy capacity by 2030?			/
1-2	Does NDC or other policy document include any information on renewables (e.g. domestic policies, targets, measures and activities)?	/		
1-3	Does NDC or other policy document define targets of renewables?			/
Reflection of the GST1 outcome	2. Governments agreed to double the global average annual rate of energy efficiency improvements by 2030. The energy efficiency improvements can be realized from three key global actions: switching to more efficient fuels, improving technical efficiency and using energy and materials more efficiently, leading to avoided demand.			
2-1	Does NDC or other policy document include any information aligned with and/or contributing to doubling the global average annual rate of energy efficiency improvements by 2030?			/

2-2	Does NDC or other policy document include any information on general energy efficiency policies?			/
2-3	Does NDC or other policy document include any information on switching to more efficient fuels? (e.g. electrifying incumbent fossil-fuelled systems such as using heat pumps in buildings and electric vehicles in transport; universal access to clean cooking technologies such as clean cookstoves)			/
2-4	Does NDC or other policy document include any information on improving technical efficiency? (e.g. new building construction, better renovations, more insulated buildings; using more efficient air conditioners, motors, refrigerators and other appliances; driving more fuel efficient vehicles; and improving industrial processes that use less energy)			/
2-5	Does NDC or other policy documents include any information on using energy and materials more efficiently to avoid demand? (e.g. consumer behaviour changes including adjusting space heating temperatures, utilising public transport, walking, or cycling instead of private cars; minimising material content of products while recycling metals and plastics; enhancing circularity in supply chains, and shifting to lower-energy-intensive activities)			/
Reflection of the GST1 outcome 3. Governments agreed to "accelerate global efforts towards net zero emission energy systems, utilizing zero- and low-carbon fuels by around mid-century".				
3-1	Does NDC or other policy documents include any information on accelerating efforts towards net zero emission energy systems?			/
3-2	Does NDC or other policy documents include any information on the use of zero- and low-carbon fuels?			/
Reflection of the GST1 outcome 4. Governments agreed to "accelerate substantial reduction of non-CO_2 emissions globally, especially, methane, by 2030".				
4-1	Does NDC or other policy document include any information on reducing methane (CH_4) emissions?		/	
4-2	Does NDC or other policy document set specific timelines for reducing methane emissions?		/	
4-3	Does NDC or other policy document include any information on reducing nitrous oxide (N_2O) emissions?		/	
4-4	Does NDC or other policy document set specific timelines for reducing N_2O emissions?		/	
4-5	Does NDC or other policy document include any information on reducing hydrofluorocarbons (HFCs) emissions?		/	
4-6	Does NDC or other policy document set specific timelines for reducing HFCs emissions?		/	
4-7	Does NDC or other policy document include any information on reducing perfluorocarbon (PFCs) emissions?		/	
4-8	Does NDC or other policy document set specific timelines for reducing PFCs emissions?		/	
4-9	Does NDC or other policy document include any information on reducing sulfur hexafluoride (SF_6) emissions?		/	

4-10	Does NDC or other policy document set specific timelines for reducing SF_6 emissions?		/	
4-11	Does NDC or other policy document include any information on reducing nitrogen trifluoride (NF_3) emissions?		/	
4-12	Does NDC or other policy document set specific timelines for reducing trifluoride (NF_3) emissions?		/	

c. Mitigation Transport

Questions		National Climate Policy		
		Yes	Partially Yes	No
Reflection of the GST1 outcome *1.* Governments agreed to "Accelerate the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero- and low-emission vehicles"				
1-1	Does NDC or other policy document include any information on reducing emissions from the transport sector?	/		
1-2	Does NDC or other policy document define qualitative targets for the transport sector?			/

d. Mitigation Forests

Questions		National Climate Policy		
		Yes	Partially Yes	No
Reflection of the GST1 outcome Governments agreed to "halt and reverse deforestation and forest degradation by 2030"				
1-1	Does NDC or other policy document include any information on halting and reversing deforestation and forest degradation?		/	
1-2	Does NDC or other policy document set specific timelines for these goals?			/

02. Malaysia's NC4

a. Adaptation

Questions		National Climate Policy		
		Yes	Partially Yes	No

Adaptation: Including adaptation ambition in the NDC is voluntary for countries, and it is necessary to do this checklist with reference to documents such as NAP and AdCom as well as NDC for adaptation (Hereafter refer to three documents as "adaptation documents" but choose the document that is most relevant to the country). Moreover, since there are no quantitative criteria to measure the progress of adaptation, it is necessary to rely on qualitative ones.

Reflection of the GST1 outcome *1.* Acknowledges the increasing adaptation efforts by Parties to enhance adaptive capacity, strengthen resilience, and reduce vulnerability.				
1-1	Does NAP or other adaptation document include information on enhancing adaptive capacity, strengthening resilience, and reducing vulnerability?	/		

Reflection of the GST1 outcome 2. Monitoring and evaluation of outcomes is critical for tracking the progress and improving the quality and awareness of adaptation action.				
2-1	Does NAP or other adaptation document include information on monitoring and evaluation?	/		
Reflection of the GST1 outcome 3. Acknowledges that establishing and improving user-driven climate services systems, including early warning systems, can strengthen the implementation of adaptation actions.				
3-1	Does NAP or other adaptation document include information on user-driven climate services systems, including early warning systems?	/		
Reflection of the GST1 outcome 4. Requires urgent, incremental, transformational and country-driven adaptation action based on different national circumstances.				
4-1	Does NAP or other adaptation document include information on urgent, incremental, transformational and country-driven adaptation?	/		
Reflection of the GST1 outcome 5. Countries need to recognize that climate change has complex and cascading transboundary risks that require international cooperation.				
5-1	Does NAP or other adaptation documents include information on transboundary risks?		/	
Reflection of the GST1 outcome 6. Countries need to recognize that long-term planning and accelerated implementation of adaptation is essential. Countries need to have their national adaptation plan by 2025 and start implementing their plans.				
6-1	Does NAP or other adaptation document include information on long-term planning?	/		
6-2	Does NAP or other adaptation document set specific timelines for implementing adaptation actions?		/	
Reflection of the GST1 outcome 7. Countries need to recognize that adaptation cycle (consisting of risk and impact assessment; planning; implementation; and monitoring, evaluation and learning) for building adaptive capacity, strengthening resilience and reducing vulnerability is essential.				
7-1	Does NAP or other adaptation document include information on adaptation cycle?		/	
Reflection of the GST1 outcome 8. Countries are encouraged to implement integrated, multi-sectoral solutions, such as landuse management, sustainable agriculture, resilient food systems, nature-based solutions and ecosystem-based approaches.				
8-1	Does NAP or other adaptation document include information on nature conservation, including land use, sustainable agriculture, resilient food systems, nature-based solutions, ecosystem-based approaches, mountain ecosystems, coastal ecosystems, etc.?		/	
Reflection of the GST1 outcome 9. Countries are encouraged to implement sector-specific adaptation.				
9-1	Does NAP or other adaptation document include actions related to the following targets?		/	

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