

# Navigating Institutional Fragmentation: Mainstreaming Climate Change Policy in Malaysia's Multi-Level Governance System

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Hj. Rosli bin Yusop is the town planning officer in the Department of Town and Country Planning, South Zone Project Office, Ministry of Housing and Local Authorities. At the forefront of his responsibilities is spearheading the integration of low-carbon development principles into local plan and state structure plan implementations. Rosli is recognized as a registered geospatial professional (Gs.) by the Institute of Geospatial and Remote Sensing Malaysia. His commitment to excellence extends beyond his current endeavours, as he actively pursues post-graduate studies in Geodisaster—a testament to his unwavering dedication to advancing his knowledge and skills in the field. Rosli's multifaceted background equips him with a nuanced understanding of the intersection between spatial planning, environmental sustainability, and disaster risk management. Through his work, he endeavors to shape resilient and liveable communities, where the principles of low-carbon development and geospatial intelligence converge to pave the way for a more sustainable future.

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Rozaidi Mahat is the urban planner and head of sustainability at Hang Tuah Jaya Municipal Council, Melaka, Malaysia. He is also a registered town planner (TPr.) and MYCREST Green Building Qualified Person (QP). Experiences in Climate Change, Sustainability and Low Carbon Development since 2010, he plays a crucial role as a focal point for Hang Tuah Jaya City related to the sustainability field. He is also involved actively in developing a framework for Hang Tuah Jaya to achieve Low Carbon City Status by 2030 and Net-Zero Carbon City by 2050, establishing connections with international collaborations such as the World Research Institute (WRI), Local Governments for Sustainability or ICLEI, and the Global Covenant of Mayors under the city's effort towards sustainability. He is an expert on the Greenhouse Gas Inventory and Climate Action Plan. Pioneer for National Program, Low Carbon Cities Framework (LCCF). Looking forward to the environmental, social and governance (ESG) to leverage the implementation of sustainability for the organisational and city-wide area. He is also involved in the three-tier government systems related to sustainability policy development including the NDC, biennial update report (BUR) for UNFCCC, Green Tax Incentive, and National Low Carbon Masterplan.

## Executive Summary

Mainstreaming climate change policy faces institutional fragmentation issues. The conventional approach to combating climate change typically involves top-down, centralised decision-making and implementation, often led by national governments. Climate change has multifaceted complexities and cross-sectoral issues that require a multi-scale approach to the provisioning of plans and strategies. The National Policy on Climate Change (NPCC) 2009 is an important document for Malaysia to promote low-carbon growth in response to climate change challenges. The NPCC outlines strategies and actions to mitigate greenhouse gas emissions, adapt to climate change impacts, and promote sustainable development. Nevertheless, the mainstream climate change policy implementation is rather unclear.

This policy brief identifies distinctive features of mainstreaming climate change policies within Malaysia's multi-level government system, the mitigation and adaptation strategy using situation analysis. The process includes the horizontal and vertical dimension analysis of development planning governance. Further, it draws out their relevance to the clear framework of multi-level climate governance within the Malaysian context of planning governance and the city-level practical implementation. Despite the absence of the Climate Change Act, the existing Malaysia's multi-tier government system accommodates the mainstreaming of climate change policy in Malaysia. The horizontal dimension of the mainstreaming climate change policy manifested in various sectoral laws and regulations and institutional frameworks. The vertical dimension of mainstreaming integrates into ongoing development evident in NPP 3 (2016 – 2020), NPP 4 (2021 – 2025), state structure and local plan known as an integrative approach. Town and Country Planning Act of 1976 empowers a three-tier government system for development planning allowing a more structured approach in accommodating the existing low-carbon cities framework as a national-driven initiative.

Despite the slow response of the state in response to NPP, some bottom-up initiatives were found at the regional level; Iskandar Malaysia and several cities. Hence, a clearer policy framework is needed to set a legally binding target. This framework requires a new governance structure that accommodates the existing Town and Country Planning Act 1976 that already governs the development planning system. Interpreting a low-carbon strategy is crucial for achieving net-zero carbon. NPP integration into state and local plans enhances low-carbon strategy.

## Key Messages and Recommendations

**Recommendation 1:** To adopt a multi-level climate governance framework for the empowerment of each level of vertical axis actor toward net-zero city.

**Recommendation 2:** To increase co-benefits linking city/ local priorities with diverse development objectives by creating a more bankable 'low-risk' environment for infrastructure finance.

**Recommendation 3:** To enhance the top-bottom coordination for low-carbon cities towards long-term emissions.

## Introduction

Mainstreaming climate change policy faces institutional fragmentation issues, despite the integration challenges of complex climate change issues that involve cross-sectoral policies and decision-making processes. Post the 2015 United Nations Climate Change Conference (COP21) in Paris, France, the net-zero ambition pledged aims to limit global warming to not more than 1.5 degrees Celsius.

Grounded in decentralization theory, multi-levels of government refer to the transfer of powers and responsibilities from the central government level to elected authorities at the subnational level (regional governments, municipalities, etc.), having some degree of autonomy (Cheema & Rondinelli 1983). A multi-level government system or approach to combating climate change involves decentralized decision-making, collaboration, and coordination across different levels of government and stakeholders. Hence, underscores the critical need for a multi-level government of climate change approach which is also known as a multi-level governance system. The system refers to a political structure in which governance authority and decision-making responsibilities are distributed across multiple levels of government.

### **Brief Description of Problem Background:**

Addressing climate change is a daunting, resource-intensive, and complex endeavour that cannot solely rely on centralized policies and regulations. The involvement of sub-national and local entities is crucial for fulfilling international commitments and targets for mitigating climate change (Betsil & Bulkeley, 2006). However, Malaysia's emission sources, predominantly urban, necessitate a focused approach to climate action in urban settings.

From the country's net GHG emission of 115,643.68 Gg CO<sub>2</sub> eq (Figure 1), about 87,889.19 Gg CO<sub>2</sub>eq emission or 75.99 % comes from urban areas. Meanwhile, the urbanization rate increased from 27% in 1960 to 61.8% in 2000. Peninsular Malaysia's urban population, which accounted for 67% of the total population in 2008, is projected to increase to 75% by 2020 as the country develops (Census Data, 2010 and 2001 RFN). The figures demonstrate the urgency to manage the climate impact in urban areas.

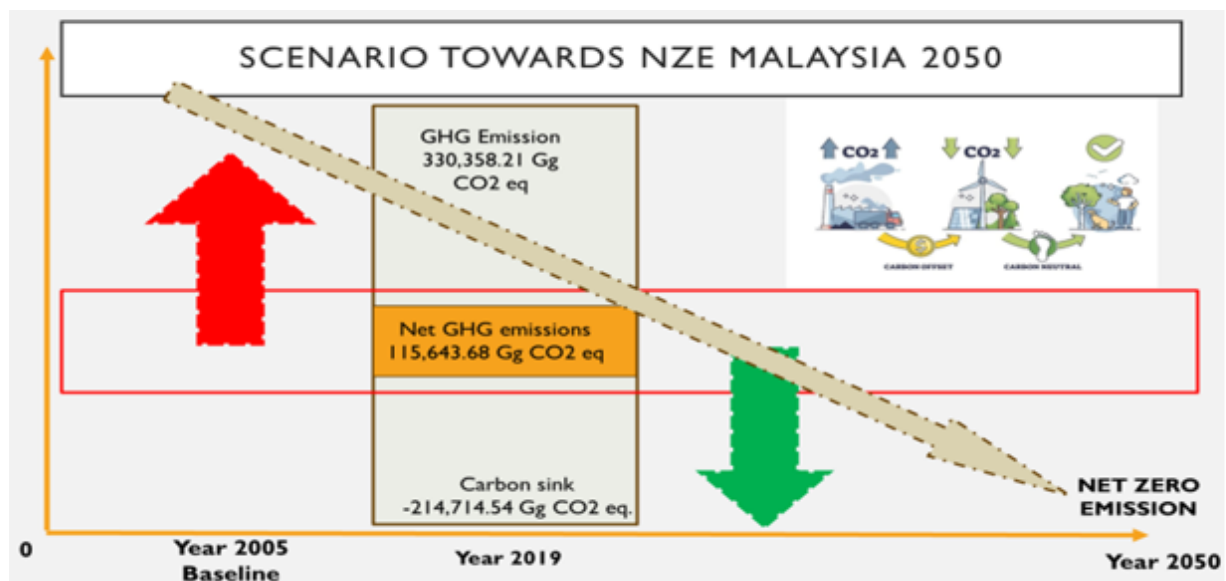


Figure 1: Scenario Towards Net Zero Emission of Malaysia 2050

Despite recent initiatives like the National Low Carbon Masterplan 2021 and the National Urbanization Policy 2 (NUP 2) 2016, challenges remain in mainstreaming climate change policies effectively, particularly at the city level. As of 2024, there are 20 areas in the country are officially termed cities by law. Among them, 16 are from Peninsular Malaysia, while 3 are from East Malaysia. The sixteen cities in Peninsular Malaysia are Kuala Lumpur, George Town, Ipoh, Johor Bahru, Putrajaya, Seremban, Shah Alam, Malacca City, Alor Setar, Petaling Jaya, Kuala Terengganu and Seberang Perai, Ipoh, Johor Bahru, Iskandar Puteri and Subang Jaya. The three cities in East Malaysia are Kuching, Kota Kinabalu and Miri. United Nations Framework for Climate Change or UNFCCC identified that strategies at the city level are needed for a country to achieve net zero emissions country by 2050.



## Problem Statement

Climate change presents complex challenges to Malaysia's institutional framework, hindering the effective mainstreaming of climate change policy. The National Policy on Climate Change (NPCC) 2009 outlines objectives to promote low-carbon growth and ensure climate-resilient development. However, challenges persist in integrating climate change policy into development planning governance, exacerbated by coordination dilemmas and the involvement of multiple actors across various sectors and scales (Abiyot et al. 2022). Hence, it is important to understand the mainstreaming of climate change policy took place within the vertical and horizontal dimensions of climate change governance. Policy fragmentation and capacity constraints (Chee & Lim 2014), particularly at the local level, impede implementation efforts and limit the impact of climate action initiatives (Khailani & Perera 2013, Zen et al. 2019). Moreover, meaningful stakeholder engagement is often lacking, further complicating mainstreaming efforts (Palermo & Hernandez 2020). Without broad-based support and participation, mainstreaming climate change policies becomes more challenging.

As a signatory of the Paris Agreement and the Nationally Determined Contributions (NDC), Malaysia needs to develop long-term low greenhouse gas emission development strategies (LT-LEDS) to achieve net-zero carbon targets by 2050. The systemic and institutional fragmentation hinder to meet these targets with environmental, economic, and societal consequences. Hence, necessitating urgent and ambitious climate action. The development of a new framework is imperative to steer current trajectories towards sustainability. Malaysia's aspiration to achieve net-zero greenhouse gas emissions by 2050, as outlined in the Twelfth Malaysia Plan (12MP), places cities at the forefront of implementation efforts at the local level. Therefore, it is essential to assess the implications of mainstreaming climate change policy across the various levels of Malaysia's government system.

This policy brief evaluates the degree of mainstreaming climate change policy implications across Malaysia's multi-tier government system and assesses initiatives to adapt and mitigate carbon emissions at the city level. Methodologically, it employs situation analysis, document analysis of key planning documents, and semi-structured interviews with local authorities to understand implementation challenges and opportunities.



To evaluate the degree of mainstreaming either integrated stand-alone climate policies or the 'dedicated approach', the implementation of national physical planning is assessed within Malaysia's three-tier government system. To address our first objective, we assess the mainstreaming of climate policies and actions (De Roeck et al., 2018) through a situation analysis. This involves evaluating the integration of climate change measures into ongoing sectoral and development planning, known as the 'dedicated approach' (Hurtado et al., 2014). Further, the evaluation on the vertical and horizontal axis of integration adopts the multi-level governance system modified from Janick (2013).

Our analysis includes qualitative assessments of the current implementation of the low-carbon development strategy, supported by document analysis of key planning documents such as the 11th and 12th Malaysia Plans (MP), National Physical Planning (NPP), state structure plans, local plans, and climate action plans. This helps evaluate the vertical integration of the low-carbon development strategy within Malaysia's three-tier government system. We complement these assessments with semi-structured interviews with local authorities to understand the implementation of climate action initiatives at the grassroots level.

## ANALYSIS OF EXISTING RELEVANT POLICIES

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Mainstreaming implementation climate policies of NPCC 2009 records ongoing sectoral development strategies in the establishment of an institutional framework and regulations. This is a reflection of the horizontal axis of mainstreaming climate change policy. Among the sectoral policies identified are the National Renewable Energy Policy and Action Plan, renewable energy (Power Sector Development Plan 2021–2039), energy efficiency (National Energy Efficiency Action Plan 2016), for transport (National Automotive Policy 2020, National Land Public Transport MasterPlan, National Electric Mobility Blueprint 2015–2030), building, manufacturing, and waste (Green Technology Master Plan Malaysia 2017–2030) and manufacturing and forestry (Malaysian Forestry Policy). The Ministry of Natural Resources and Environmental Sustainability coordinates these efforts, with support from agencies like the Department of Environment and the Malaysian Green Technology and Climate Change Centre. It shows a continuum-integrated approach to mainstreaming climate change policy on the horizontal dimension of the multi-level government system. Despite their manifestation in sectoral policies and frameworks, the extent of mainstreaming climate policies and actions at the local level remains unclear and creates institutional fragmentation.

Mainstreaming in the climate change literature refers to the integration of policies and measures aimed at addressing climate change into ongoing sectoral and development planning and decision-making processes (Hurtado et al., 2014). The success of implementation is often strongly associated with the degree of mainstreaming of climate policies and actions (De Roeck et al., 2018). This approach is considered one of two distinct policy options for addressing climate change, alongside the development of stand-alone climate policies, also known as the 'dedicated approach' to local climate planning. Some observers view a continuum of integration in local plans, ranging from narrowly addressing single impacts to addressing broader sustainability or resilience issues.

## ANALYSIS OF EXISTING RELEVANT POLICIES

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Further analysis, describes the vertical axis analysis of a multi-tier government system that accommodate mainstreaming climate change policy. From the three-tier government system, the National Physical Planning (NPP) frameworks, particularly NPP 3 and 4, demonstrate efforts to integrate low-carbon development strategies at the national level. After NPCC 2009, the first manifestation of climate change policies was recorded in the National Physical Planning, NPP 3 (2016 – 2020) and 4 (2020-2025). This slow response, however, the NPP3 spelt out in thrust 2: spatial sustainability and climate change resiliency for assessment purposes, under SR 3 low carbon cities and sustainable infrastructure. Further, the document stated the need to develop a low-carbon city action plan developed by the State Structure Plan (SSP) and Local Plan (LP). The continuity of this effort is recorded in the NPP4 (2020-2025), which is focused and strengthened aspects to complement the 12th Malaysia Plan: A Prosperous, Inclusive, Sustainable Malaysia. NPP 4 Spatial Strategies: Towards 'A Prosperous, Resilient and Liveable Nation', under Strategy 8, it is stated 'Development Towards a Carbon Neutral Nation', which states 'Towards Carbon Neutral Nation'. It is further detailed in Chapter 8. Advancing Green Growth for Sustainability and Resilience and SR 3.1 Expand the Implementation of the Low Carbon Cities Framework.

Despite the absence of National level facilitation, the vertical axis of mainstreaming climate change policy analysis found the voluntary effort at the regional level, Iskandar Malaysia via Low Carbon Society (Ho et al. 2013). As a voluntary bottom-up approach, this initiative helps in facilitating several local authorities to implement the LCS agenda in Iskandar Puteri Municipal Council and Johor Bahru City Council (Zen & Mohammad 2022). At the state level, the Melaka Climate Action Plan is among the documents referred to by the Hang Tuah Jaya Municipality to develop its climate action plan (Ho et al. 2020). Hence, indicate progress in the vertical integration of mainstreaming climate change policy at the state level. The integration of policies and measures to tackle climate change within ongoing sectoral and development planning, as highlighted by Hurtado et al. (2014), represents an integration policy approach which is often referred to as the 'dedicated approach' to local climate planning. It can be concluded that despite the absence of stand-alone climate policies and their regulatory binding, the mainstreaming climate change policy exists on the vertical axis exists via integrative planning governance. This sporadic and fragmented effort needs to be recognised for better coordination and monitoring of the performance in carbon emission reduction and its initiative at the local level under Malaysia's multi-level climate governance (Figure 2).

## ANALYSIS OF EXISTING RELEVANT POLICIES

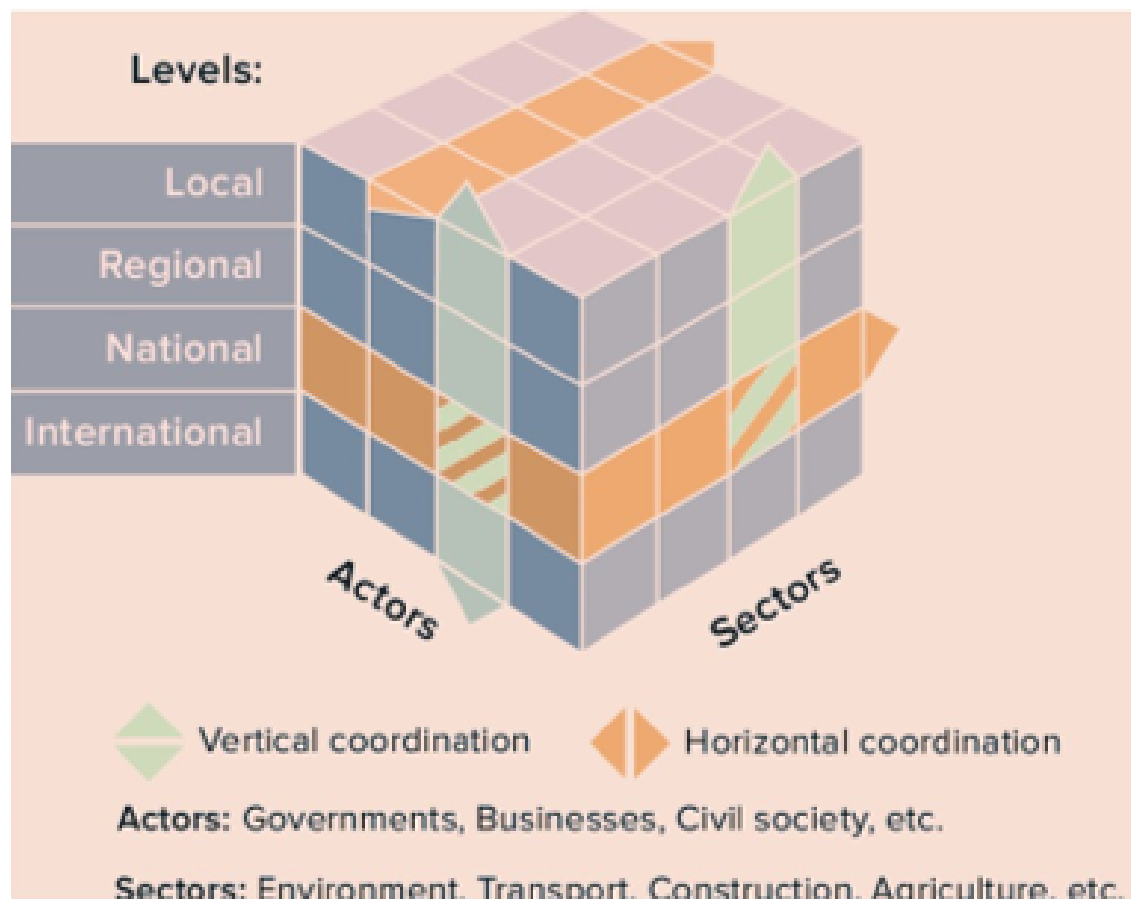


Figure 2: Proposed Malaysia's Multi-Level Climate Governance

In multi-level climate governance, both top-down and bottom-up approaches can enhance vertical cooperation (Bauer & Steurer, 2014). The top-down approach involves actions initiated by higher levels of government and implemented at lower levels, like national to local. This includes translating the Paris Agreement's net zero commitment to local governments. Studies suggest healthy competition among cities within this framework (Ken & Alber, 2009). Conversely, the "bottom-up" approach of low carbon governance involves actions and initiatives initiated at the grassroots level, often by local communities, and subsequently integrated into higher levels of government policy (Markantoni 2016).

Efforts by Iskandar Puteri City Council (MBIP) in providing the Low-Carbon Community Grants programme have succeeded in stimulating collaboration with the local community. About MYR 440,000 was provided to fund 31 projects in their respective locality which encourages collaborative work with various stakeholders (Yee 2022). Currently, about 71 projects launched that support close to MYR 1 million under the quadruple helix framework.

The connection established between local government with the community will support the local government's adaptation policy strategy which has been successfully applied in Copenhagen, Denmark. This alternate strategy supports local adaptation and the decision-making process when it is based on feedback and action from the community. The input should be seen as a component of a larger system approach to climate change adaptation as it might be crucial in developing local coping and adaptation methods (Ersbak 2011). Therefore, acknowledging community action as a crucial phase in the policy-making process increases communities' ability to adapt and can connect to more extensive initiatives by state and local governments.

At the sub-national level, states like Melaka and Selangor have developed climate action plans, either independently or as part of their structure plans. These plans integrate green technology across energy, building, water, and waste management sectors. For example, Selangor's Structure Plan (SSP) emphasizes environmental sustainability, aiming for net-zero greenhouse gas emissions and promoting renewable resources. At the local level, some authorities have adopted the global protocol for greenhouse gas community-wide or GPC developed by the World Research Institute (WRI). Despite the involvement of local authority, Las in low carbon cities framework, LCCF as a national initiative, the GPC method was adopted for their climate action plan, i.e. Melaka State Climate Action Plan 2020 - 2030 (Zen et al. 2019), Subang Jaya Climate Action Plan (<https://www.facebook.com/MBSubangJaya/videos/1229535117607088/>) to support country's Net Zero Carbon by 2050.

Despite of different assessment tools adopted; the local government has responded to the requirement of developing a climate action plan by NPP4. Different assessments method challenges the execution of a low-carbon development strategy at the city level (NLCCM 2021). For LAs that have executed LCCF for the past ten years, the carbon assessment tools are not recognized as a global standard. This challenge has been stated as one of the obstacles in NLCCM which is focused on the mitigation aspect.

Recent studies highlight integrated approaches in climate policy at the local level in Europe and the United States combining mitigation and adaptation (Reckien et al., 2014, 2018; Grafakos et al., 2020). Key strategies include identifying factors for integrated climate planning, such as mitigation and adaptation strategies and mainstreaming mechanisms by using recognised global standard assessment tools (Reckien et al., 2014, 2018; Aylett, 2015). The Danish city of Copenhagen is one of the examples of a municipal government in Europe that has adopted an integrated approach to climate policy. To reduce greenhouse gas emissions and prepare for climate change, Copenhagen has implemented a comprehensive plan known as the "Copenhagen Climate Plan" (Hofstad & Vedeld 2020). This strategy combines many policy initiatives from several industries, including waste management, buildings, energy, and transportation.

Climate mitigation and adaptation initiatives in many cities are progressing slowly. In Kuala Lumpur, the Climate Action Plan (KLCAP) aims to transform the city into a low-carbon and resilient urban centre by 2050. Despite slow buy-in since 2009, recent efforts like the Kuala Lumpur Low Carbon Society Blueprint 2030 show promise. Mitigation priorities include transportation and energy efficiency in buildings. Key factors for successful climate action plans include political will, public engagement, innovation, and international cooperation. Several international cooperations found in KLCAP, Petaling Jaya Climate Action Plan, Low Carbon Society

At the local level, cities like Petaling Jaya and Cyberjaya prioritize low-carbon mobility and green building practices, though challenges in carbon emissions assessment persist. On the analysis of the vertical dimensions, the Petaling Jaya City Council initiated the low-carbon cities initiative earlier than the SSP produced. This voluntary bottom-up approach shown in the assessment tax rebate for eco-friendly house owners with low carbon in the green city of Petaling Jaya since 2015. The initiative encourages carbon emission reduction from the residents. In Hang Tuah Jaya, the Climate Action Plan 2030 focuses on protecting and establishing green spaces under Theme 3, managed by the Town Planning Department. It invites private sector partners, targeting completion by 2025.



Overall, while Malaysia's policy landscape reflects a commitment to mainstreaming climate change policy, further coordination and implementation are needed across all levels of government to effectively address climate challenges. Multilevel governance theory and empirical evidence demonstrate that the coordination and vertical integration of climate actions can help alleviate domestic political constraints (Muller 2015). By having a low-carbon city strategy, it deploys the integrative approach in the ongoing development across sectoral policies and institutional fragmentation via the introduction of a low-carbon city/development strategy under NPP 3 and 4. Under the Town and Country Planning Act 1976 (Act 172) where the three-tier level of the Malaysia government system has jurisdiction power to execute the planning development at the regional/ state and local levels, the interpretation of low-carbon development strategy to support net-zero carbon becomes imperatives.



## POLICY RECOMMENDATIONS

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To take advantage of a strategic vision of a net zero carbon path in 2050, the following recommendations are made for policymakers and other stakeholders to facilitate low-carbon transitions in meeting the global net zero emission for climate change. Grounded in a decentralised government system and approach, mainstreaming climate change policy within planning governance could be enhanced with several actions:

1) Adopt a multi-level climate governance framework for the empowerment of each level of vertical axis actor toward net-zero city. The existing three-tier of a government system that adopts planning governance needs to be strengthened by providing public-private partnerships and inter-ministerial consultations to support the multi-tier government. This is to help in delivering the best possible sustainable outcomes by catering to multiple objectives through the empowerment of the climate adaptation approach. In this sense, the multi-levels of government definition are also about reconfiguring the relationships between the central government and subnational governments towards more cooperation and coordination in combating climate change.

2) Increasing co-benefits linking city/local priorities with diverse development objectives by creating a more bankable 'low-risk' environment for infrastructure finance. The concept of multi-level governance has gained traction, especially at the local level, echoing the principle of 'think global, act local,' particularly in urban areas. Cities, in particular, serve as prime examples of such locations where local governance actions can play a pivotal role in reducing GHG emissions (Kem & Alber 2008). In some cases, the authority granted to local governments within cities has been seen as surpassing policy goals at the national and international levels. Consequently, many local governments have taken proactive steps to combat urban climate change, underscoring the importance of local-scale multi-level governance in addressing global climate challenges within urban environments.

## POLICY RECOMMENDATIONS

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**3)** Enhance the top-bottom coordination for low-carbon cities towards long-term emissions.

**4)** It is imperative to have one body to connect private entities/ industry, local authority and higher education institutions at the sub-national level, such as Melaka Green Technology Corporation to accelerate the city accelerate low carbon development agenda.

**5)** Despite challenges in providing greenhouse gas, and GHG data at the city level, climate action initiative needs to be accelerated with a low-hanging fruit approach by aligning existing initiatives.

**6)** City climate action plan is crucial to support Malaysia NZE 2050.

## References

- Abiyot, Dagne, Belay., Cynthia, Elliott., Jan, Corfee., Solomon, Tsehay. (2022). Mainstreaming Climate Change in Ethiopia's Planning Process. doi: 10.46830/wriwp.21.00032
- Bauer, A., & Steurer, R. (2014). Multi-level governance of climate change adaptation through regional partnerships in Canada and England. *Geoforum*, 51, 121-129.
- Betsill, Michele; Harriet Bulkeley (2006). "Cities and the Multi-level Governance of Global Climate Change". *Global Governance*. 12 (2): 141–159. doi:10.1163/19426720-01202004. S2CID 154505883
- Chee, Y. L., & Lim, L. C. (2014). Fragmentation to Integration: Environmental and sustainable development challenges in Malaysia. In *Environmental Policies in Asia: Perspectives from Seven Asian Countries* (pp. 109-132).
- Cheema, G. S., & Rondinelli, D. A. (Eds.). (1983). Decentralization and development. Policy implementation in developing countries (p. 319pp).
- De Roeck, F., Orbie, J., & Delputte, S. (2018). Mainstreaming climate change adaptation into the European Union's development assistance. *Environmental Science & Policy*, 81, 36-45.
- Ersbak, K. (2011). Assessing An Alternative Approach Perspectives on Adaptation Planning and Climate Change Policy from Copenhagen, Denmark. Department Of Urban and Regional Planning, The University of Hawai'i At Manoa.
- Hofstad, H., & Vedeld, T. (2020). Urban climate governance and co-creation–In Cape Town, Copenhagen, Gothenburg and Oslo.
- Jänicke, M., Schreurs, M., & Töpfer, K. (2015). The potential of multi-level global climate governance. Institute for Advanced Sustainability Studies (IASS) Policy Brief, 2, 2015.
- Khailani, D. K., & Perera, R. (2013). Mainstreaming disaster resilience attributes in local development plans for the adaptation to climate change-induced flooding: A study based on the local plan of Shah Alam City, Malaysia. *Land use policy*, 30(1), 615-627.
- Markantoni, M. (2016). Low carbon governance: Mobilizing community energy through top-down support? *Environmental Policy and Governance*, 26(3), 155-169.
- Muller, Scott A. (2015). "The Coordination and Vertical Integration of Climate Actions" (PDF). LEDSGP Working Paper.
- Palermo, V., & Hernandez, Y. (2020). Group discussions on how to implement a participatory process in climate adaptation planning: a case study in Malaysia. *Ecological Economics*, 177, 106791.
- Yee, X. Y. (2022, Oct 12). 31 projects get Iskandar Puteri low-carbon grants worth RM440,000. The Star. [https://www.thestar.com.my/metro/metro-news/2022/10/12/31-projects-get-iskandar-puteri-low-carbon-grants-worth-rm440000]
- Zen, I. S., Al-Amin, A. Q., & Doberstein, B. (2019). Mainstreaming climate adaptation and mitigation policy: Towards multi-level climate governance in Melaka, Malaysia. *Urban Climate*, 30, 100501.

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