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Addressing pollution and climate change within urban transport in Southeast Asia

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Summary

This policy brief presents innovations in urban transport that could decrease pollution levels and contribute to climate change actions. The research focuses on solutions implemented in Malaysia and assesses the potential for replication and adaption in Indonesia, one of the largest greenhouse emitters in the ASEAN (Association of Southeast Asian Nations) region (Government of Indonesia, 2021a). Indonesia aims to reduce greenhouse gas emissions (GHG) by 29 per cent voluntarily, or 41 per cent with international support.[1] There is potential for Indonesia to reduce GHG emissions with measures such as investments in public transport and low-emission transport technologies. This policy paper aims to present key recommendations to achieve these objectives based on the lessons learned in Malaysia.

Key messages

- **Increase public transport provision in the urban area.**
- **Develop travel on demand method e.g. public transport planning, park-and-ride hubs.**
- **Increase infrastructure development with links to technology and apps.**
- **Create an integrated ticketing system.**
- **Expand infrastructure and develop policy to accelerate the shift to electric vehicles and buses.**
- **Increase fiscal incentives to boost the usage of low-carbon fuels in the transport sector (for example, phase out subsidies to coal-based fuels).**
- **Increase international co-operation oriented to ease access to low emission transport technologies.**

Introduction

Climate change has clear implications, with hydrological patterns changing due to GHG emissions (Li *et al*, 2022) and resulting in widespread destruction, financial losses, and a hazard to human life (Chang *et al*, 2020; Li *et al*, 2022) which cost more than $1.75 trillion (Smith and Arndt, 2020). It is estimated that climate change-related disruptions in Asia will cost more than a quarter (26.5 per cent) of the region's Gross Domestic Product (GDP) by 2050 (Higginbotham, 2021) and transport is part of the contributing factors (OCDE,2022).

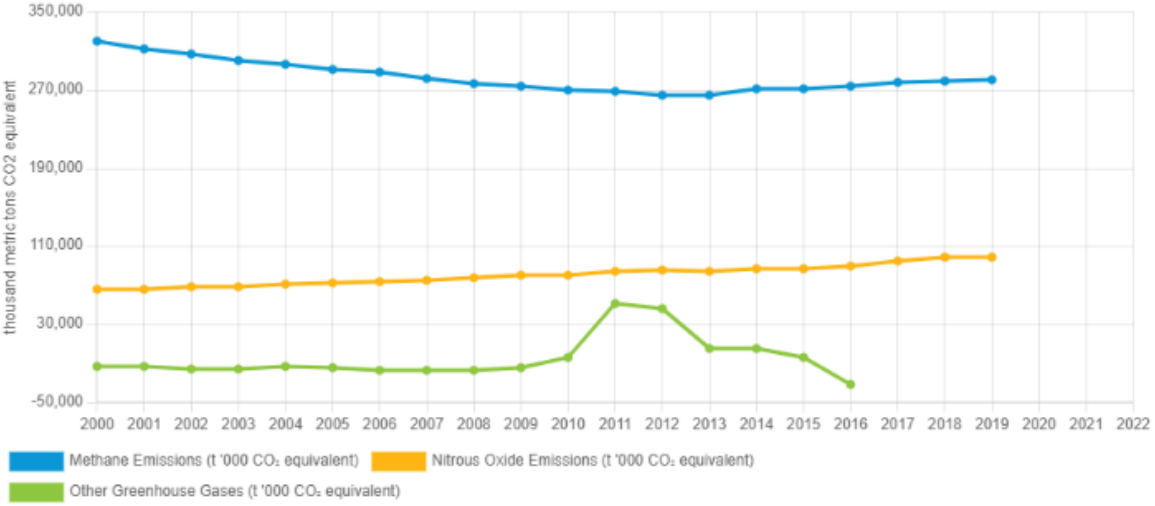
The study

This research presents innovations in urban transport to address the problem of pollution and climate change. The primary focus is on transportation planning and operational strategies in Malaysia. Subsequently, the authors present the potential implementation of these solutions in Indonesia, as one of Southeast Asia's most significant contributors to climate change. The first part of this policy brief presents potential improvements in Indonesia's policy framework and the contribution of transport to pollution. The second part focuses on understanding the potential for improvement in Malaysia's transportation and planning operation strategies.

[1] This is part of the Paris agreement ratified by Indonesian through Law No. 16 Year 2016

In ASEAN, climate change is likely to impact water availability, health and nutrition, disaster risk management, and urban development, particularly in coastal zones, with implications for poverty and inequality. By 2030, Indonesia is expected to endure temperature increases of about 0.8 degrees Celsius (BAPPENAS,2018) with frequent rainfall El Niño/La Niña events expected. These disturbances in the weather could contribute to a loss of up to 20 per cent of GDP (BAPPENAS, 2018).

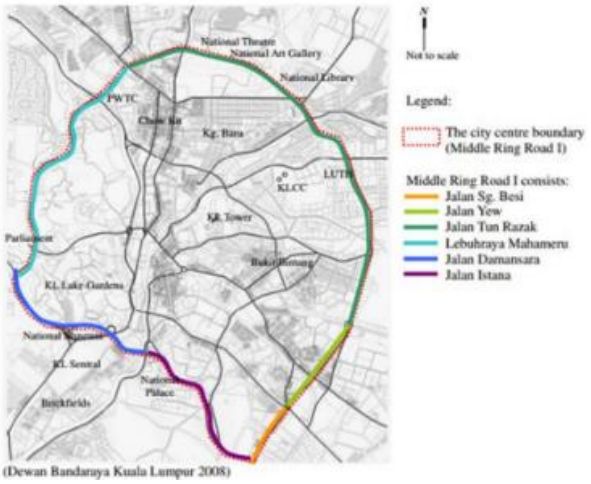
Pollution Key Indicators: Evolution Indonesia 2000-2019



Source: ADB (Asian Development Bank, Key Indicators Database 2022).

The graph above shows current emissions are well above projections. To achieve its targets, Indonesia may need to amend its policy framework to incentivise the transformations required in the energy and transport sectors. The energy sector, which transportation is dependent upon, was the second largest emitting sector in Indonesia, contributing to 34 per cent of total emissions in 2019 and is projected to turn into the largest emitter by 2030, if no decarbonisation efforts are implemented (OECD, 2022, Solaymani,2019). Transportation is regarded as one of the fastest-growing sources of GHG emissions worldwide (Grazi and van den Bergh, 2008).

Kuala Lumpur and its pedestrian 'unfriendly' walkways



(Dewan Bandaraya Kuala Lumpur 2008)

The regulatory review process was strengthened to ensure consistency, and these policies have made fossil fuels more financially attractive than less emission-intensive energy. This issue could be redressed by raising fuel taxes (or phasing out the subsidies) and developing support measures for adopting electric vehicles. Fiscal

and non-fiscal incentives should also be considered. This includes the development (and financing) of infrastructure. In the case of electric cars, charging stations, special lanes to avoid traffic, and tax exemptions.

Apart from that, understanding the commuter's needs is crucial because Malaysian citizens, especially those living in the city centre, have been too dependent on private transport due to high dissatisfaction with most transport design provisions (Sham *et al,* 2020). The research also showed that 90 per cent of the current public transport commuters would shift to private transport if they were given a choice to ride in a private vehicle. As reported in a previous study, walking can reduce carbon emissions and improve green mobility (Sham *et al*, 2022). Moreover, delighted passengers indicated a higher perception of safety while travelling and tend to repeat the usage of public transport if given a choice.

In May 2022, data was collected among urban citizens living in the city centre of Kuala Lumpur, Malaysia, using a stated preference survey. They were selected within the active working age who live and work in the city centre and commute to work using public transport.

Walking activities among pedestrians and users of public transportation have been disturbed by poor accessibility and an unpleasant walking environment (Walton *et al*, 2010). There have been complaints from pedestrians of how unfriendly local pedestrian walkways are, expressing dissatisfaction, and suggesting improvements for sidewalks along Klang Valley. If the problem is not solved, their level of satisfaction while riding on public transport would be affected, and this will be reflected in a reduction in the ridership of the public transport that leads to higher carbon releases if private vehicles are used.

Results, conclusions, and recommendations

Below are the study recommendations…

- National energy policies need to be integrated into national climate change policies.
- Engage a good public transport provision and infrastructure in an identified urban area.
- Engage in a proper demand travel by having ample park-and-ride centres.
- Operate an electric bus service in a selected urban area.
- Increase the usage of integrated ticketing in the public transport payment system.
- Policy measures to encourage the usage of electric motorcycles are required.

These recommendations will result in a sustainable transport practice that reduces the carbon released that indirectly affects climate change.

Enhance the public transport provision, infrastructure, and operation

This can be done through a strategy of push factors towards the usage of public transport over private transport. Among the methods used is to focus on the transport service characteristics and provision in the urban area for people to commute.

Engage with the integrated ticketing

With integrated ticketing, no printing is required, and this creates attraction for public transport usage. In the long run, this will indirectly reduce carbon emissions and address future climate change.

Implement a travel on demand approach with park-and-ride hubs

This will create a centre of attraction and the public could be attracted to use the public transport as compared to their private transport.

About the authors

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