

# Low Emission Zone Policy in Indonesia: Opportunities and Challenges

Fathoni Agung Nugraha

## Summary

Carbon emission is a severe problem faced by Indonesia today. Data shows that Indonesia's carbon emissions level will reach 692 million tons of CO<sub>2</sub> in 2022 and is projected to increase significantly. Of the various sources of carbon emissions, the transportation sector is one of Indonesia's second most significant contributors to greenhouse gas emissions. Responding to existing problems, the government initiated the Low Emission Zone (LEZ) policy, a restriction scheme for vehicles that do not meet emission requirements in an area. Implementing the LEZ policy is a new opportunity for the Indonesian government to face the problem of climate change. However, implementing the LEZ policy still has several challenges, such as policy monitoring, regulatory strictness and low public awareness. If the adaptation of the LEZ policy can accommodate existing challenges, this policy certainly has great potential to reduce carbon emissions and the impact of climate change significantly.

**Keywords:** Carbon emissions, Transportation, Low Emission Zone, Climate Change

## Introduction

Climate change is a serious problem that threatens global society today. Data from the United Nations shows that climate change has caused increased temperatures, high-intensity disasters, decreased water availability, and high health risks (United Nations, 2023). In Indonesia, climate change has caused several problems, such as rising sea levels, the increasingly rapid frequency of El Niño and La Niña and the increasingly high intensity of extreme weather (BMKG, 2023). This condition is increasingly exacerbated by the high concentration of carbon emissions increasing in Indonesia. Data from the Energy Institute shows that Indonesia is in sixth place as a global carbon emitter, with 692 million tons of CO<sub>2</sub> and is below Japan and Russia (Energy Institute, 2022). Increasing gas concentrations will undoubtedly lead to more severe climate change problems if unchecked.

One of the sectors contributing to Indonesia's most significant carbon emissions is the transportation sector. Data from the Indonesian Ministry of Energy and Mineral Resources (Energi dan Sumber Daya Mineral/ESDM) shows that the transportation sector is Indonesia's second largest

contributor to greenhouse gas emissions after the energy sector (ESDM, 2020). The intensity of carbon emission in this sector will continue to increase due to the transportation sector's high dependence on fossil fuels. More specifically, other data shows that land transportation in Indonesia contributes at least 90% of emissions and is projected to increase in the next few years (IESR, 2023). Increasing emissions in the transportation sector will undoubtedly have a more dangerous impact on Indonesian society in the future.

Responding to existing problems, several regional governments in Indonesia have begun to initiate the Low Emission Zone (LEZ) concept. LEZ is a restriction scheme for vehicles that do not meet emission standards in a region. One of the regional governments that applies the LEZ concept is the Special Capital District (Daerah Khusus Ibukota/DKI) of Jakarta Provincial Government. In February 2021, the LEZ concept was first implemented in the tourist destination area of Kota Tua, Jakarta. Through traffic engineering and restrictions on motorised vehicles, the DKI Provincial Government aims to improve

the air quality in the Kota Tua tourist area (Wihanesta et al., 2022). In its implementation, only pedestrians, cyclists, public transportation and vehicles with low-emission stickers can enter the Kota Tua tourist area.

Furthermore, a similar concept is also included in the Bali Regional Government's Development Plans through Low Emission Areas (Kawasan Rendah Emisi/KRE). KRE is a derivative of the Bali government's ambitious target of achieving Net Zero Emissions in Bali by 2045 (WRI Indonesia, 2023). Implementing the LEZ concept in several regions is a good start for the Indonesian government in facing the problem of climate change.

However, implementing the LEZ concept still has challenges that must be considered. Applying the LEZ concept has provided a new step for climate change mitigation efforts in Indonesia. Nevertheless, in a more profound analysis, the LEZ policy still requires several adjustments, such as the need for a national grand design regarding this policy and a policy focus that is not only short-term-oriented. The Indonesian government needs to consider existing challenges to achieve the ambitious target of Net Zero Emissions by 2050. This circumstance raises the question: **What are the opportunities and challenges of implementing the LEZ policy in Indonesia?**

To answer this question, this op-ed will comprehensively analyse the challenges of the LEZ policy as well as the opportunities for this policy in the future. It is hoped that the Indonesian government can implement this policy optimally.

### **Low Emission Zone Concept**

The LEZ concept was first initiated by the Swedish government. In the 1990s, the Swedish government implemented the LEZ concept through the Trafikförordningen policy (Swedish Government, 1998).

Trafikförordningen policies aim to reduce air and noise pollution in several areas through restrictions and regulations for heavy vehicles such as buses and trucks. The Trafikförordningen policy limits and prohibits heavy vehicles exceeding 3.5 tonnes and vehicles over eight years old from the time they are registered from passing through LEZ areas such as Gothenburg, Stockholm and Malmo (ITDP Indonesia, 2022). Furthermore, the Trafikförordningen policy has been further strengthened and integrated nationally and applies to all Swedish city centres.

Not only in Sweden, the LEZ concept is also implemented in many other countries. One country that applies the LEZ concept is Germany. Germany implemented the LEZ concept in its policy called Umweltzone in 2008. Almost similar to the policy in Sweden, the Umweltzone policy limits vehicle traffic in Berlin by classifying stickers affixed to car windows. Only vehicles with green stickers (tested to use environmentally friendly fuel) can pass through LEZ areas (ITDP Indonesia, 2022). The following country to implement the LEZ concept is Italy, with the target LEZ area in Milan. Through the congestion pricing policy, every vehicle passing through the LEZ area must pay according to the vehicle's emission level. Apart from Germany and Italy, the LEZ concept is also applied in China, in the Beijing city area. The Chinese government prohibits vehicles with the potential to have high pollutants or vehicles with yellow labels during registration from entering areas by the LEZ area zoning.

In Indonesia, the LEZ concept was first initiated by the DKI provincial government through the Kota Tua pilot area. In February 2021, the DKI Jakarta provincial government inaugurated the LEZ program in the Kota Tua area after conducting trials in the previous few months. Implementing the LEZ concept in the Kota Tua area is a derivative of the central policy regulated in DKI Jakarta Governor Regulation No. 36 of 2014 (Sofyaningrat & Hanggara, 2021).

In its implementation, the Kota Tua LEZ area includes several roads that lead to Kota Tua tourism, including Jl. North Big Door, Jl. West Kalibesar South side, Jl. South side of Kunir, Jl. Kemukus, Jl. Coriander and Jl. Pepper. Motor vehicle restrictions apply to private vehicles for 24 hours and only allow pedestrians, public transportation, cyclists and vehicles with unique low-emission stickers (Wibawana, 2022). Implementing the LEZ policy is a step by the DKI Jakarta Provincial Government to minimise pollution levels. It is expected to achieve the target of reducing up to 26% of current pollution.

### **The Opportunity of LEZ policy in Indonesia**

The Low Emission Zone (LEZ) approach has proven successful in providing a significant impact in reducing air pollution levels in an area. One of them is the implementation of LEZ in Sweden; through the Trafikförordningen policy, the Swedish government succeeded in reducing Particulate Matter (PM) by 40% and reducing truck emissions by up to 67%. Furthermore, the implementation of LEZ in Germany also has the impact of reducing emissions by up to 20% every year. Apart from that, the LEZ approach in Italy has also succeeded in reducing PM2.5 and PM10 concentrations every year. Lastly, implementing the LEZ in Beijing has also proven successful, with carbon emissions decreasing by 34% compared to before the LEZ was implemented.

Projected success can also be seen in the implementation of LEZ in Kota Tua, Jakarta. Emission measurement data from the Environmental Service shows decreased emission concentrations before and after implementing the LEZ policy (Damarjati, 2021). The reduction in emissions in the spotlight is the PM2.5 and SO2 levels in the Kota Tua area. Before the implementation of the LEZ, PM2.5 levels in the old city were at 25-28 micrograms, and SO2 levels were at 53 micrograms. After the implementation of the LEZ, the concentration

of these two emissions decreased, with PM2.5 levels being 18 and SO2 levels being 49. This is only temporary by comparing conditions before and after LEZ implementation. Further analysis of LEZ implementation is undoubtedly needed to draw more long-term conclusions.

### **Challenges of Implementing LEZ Policy in Indonesia**

Even though it has significant implementation opportunities, the LEZ policy in Kota Tua still has several challenges. Since it was implemented in February 2021, monitoring and evaluation results show several notes on the implementation of LEZ in the Kota Tua area (ITDP Indonesia, 2022). The main challenge that is an obstacle to implementing LEZ is motor vehicle restrictions that are not optimal. From several points that serve as borders in the LEZ area, there are still many motorised vehicles that violate regulations. There needs to be more than the presence of point guards to stem the behaviour of motorised vehicles that are reluctant to take detours. The traffic restriction scheme in the Kota Tua area has also been proven to cause congestion on alternative roads (Iman A, 2021). Motor vehicle congestion is estimated at up to 450 meters due to road closures in the Kota Tua area.

Not only that, the implementation of LEZ also needs to pay attention to the flow of public transportation in the Kota Tua area. The existence of the Kota Tua train station also needs attention because there are still many train passengers who order online motorbike taxis and invite motorised vehicles to enter the LEZ area (Dewi, 2023). The DKI Jakarta Provincial Government and related institutions need to educate the people in the Kota Tua area about existing regulations in the LEZ area and their implementation.

Furthermore, the LEZ policy concept also requires a grand design that can be implemented nationally. Until now, there are still two regions in Indonesia

that are starting to implement the LEZ policy, namely Kota Tua and Bali. In Bali, the LEZ concept or what is called a Low Emission Area (KRE) is contained in the ambitious scenario of the Bali provincial government's Regional Action Plan (RAD) for 2022-2026 (Muhammad R, 2023). The KRE program complements the program previously running, namely the Acceleration of Battery-Based Electric Motor Vehicles (KBLBB) in Bali.

Implementing the LEZ program, which is still regional, requires a more national policy umbrella. The detailed LEZ policy indicators and timeline are notes the Indonesian government needs to consider in the future.

### **Conclusion**

The implementation of LEZ is an excellent first step for Indonesia in reducing motor vehicle emissions. The implementation of LEZ in several countries has proven successful in improving air quality in LEZ areas. An area's motor vehicle restriction scheme has encouraged public awareness to choose to use public transportation or walk. Through optimal traffic speed planning, carbon emissions in an area will decrease significantly and the existing air quality will improve. Based on monitoring before and after the policy, the implementation of LEZ in Kota Tua also succeeded in having a good impact, as seen by the reduction in PM2.5 and SO<sub>2</sub> in the area. The hope is that this positive trend will not only last in the short term but also in the long term.

However, the implementation of LEZ in Indonesia still has several challenges. The main challenges faced by LEZ implementation in Indonesia are regulatory commitment and public awareness. Based on the results of the program evaluation, there are still many violations done by motorised vehicles passing through the LEZ area.

Portal guards at several border points still lack enforcement, allowing vehicles without stickers to enter the LEZ area. Apart from that, in the broader scope, implementing the LEZ policy also requires a national grand design so that the LEZ area can be massively implemented throughout Indonesia. Furthermore, implementing the LEZ policy also requires awareness from the public to comply with existing regulations.

In conclusion, LEZ will significantly impact the air quality of an area if it accommodates existing challenges.

Reflecting on the success of several countries that have previously implemented LEZ, this policy concept has achieved an optimal impact in reducing motor vehicle emissions. Even though its implementation faces several challenges, long-term-oriented policies can gradually change people's habits and initiate better ones. The implementation of the LEZ in Kota Tua has become a good starting line for further future projections for Indonesia.

### **Disclaimer**

The views expressed in this op-ed are those of the author or authors of this article. They do not necessarily represent the views of RDI, its editorial committee, or the mentioned speakers' affiliation.

---

### **Author**

**Fathoni Agung Nugraha**  
Jember University

### **Supervisor**

**Nabila Safitri, Rufaida Nurul Vicri**  
Research Officer & Academic Programme Manager  
Resilience Development Initiative

## References

- BMKG. (2023). Informasi Parameter Iklim.
- Damarjati, D. (2021, February 17). DKI Nyatakan Kualitas Udara Menjadi Baik Setelah LEZ Kota Tua.
- Dewi, M. F. (2023, January 17). Zona Rendah Emisi Kota Tua Minim Implementasi.
- Energy Institute. (2022). Penghasil Emisi Karbon Sektor Energi Terbesar Global.
- ESDM. (2020). Inventarisasi Emisi GRK Bidang Energi.
- IESR. (2023). Elektrifikasi Transportasi Demi Tekan Emisi GRK.
- ITDP Indonesia. (2022). Dokumentasi dan Rekomendasi LEZ Kota Tua Jakarta.
- Sofyaningrat, S., & Hanggara, A. (2021). Jakarta's Kota Tua is Now a Low Emission Zone.
- Swedish Government. (1998). Trafikförordning (1998:1276).
- United Nations. (2023). Causes and Effects of Climate Change.
- Wibawana, W. (2022, September 11). Low Emission Zone Artinya Apa? LEZ Berlaku di Kota Tua Jakarta.
- Wihanesta, R., Rizki, M., & Nindyarini, A. (2022, August 5). Kawasan Rendah Emisi (KRE): Langkah Strategis Kota untuk Mengurangi Emisi dan Polusi Udara.
- WRI Indonesia. (2023). Deklarasi Menuju Bali Emisi Nol Bersih 2045 Pertegas Komitmen Visi Pembangunan “Nangun Sat Kerthi Loka Bali.”

