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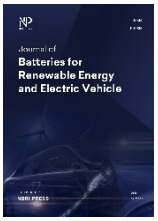

Green Politics and the Policy Cycle in Indonesia's Electrification Journey: A Comparative Analysis of Policy Priorities for Electric Cars and Public Transport

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ABSTRACT

This paper presents a comprehensive descriptive study and document analysis of policy priorities for electric cars and public transport in Indonesia, within the context of the country's electrification journey. Utilizing secondary data sources including policy documents, government reports, academic studies, and news articles, we apply the principles of green politics and the stages of the policy cycle to interpret our findings. Our comparative analysis reveals distinct policy priorities for electric cars versus public transport, with implications for Indonesia's environmental, economic, and social goals. We discuss these findings in relation to the principles of green politics and the stages of the policy cycle, providing insights into the political and policy dynamics shaping Indonesia's electrification journey. The paper concludes with recommendations for future policy priorities and strategies, aimed at promoting a more sustainable and equitable transition to electric mobility in Indonesia, and suggests areas for future research. Our research contributes to the growing body of literature on electrification policies in developing countries, and offers valuable insights for policy makers, industry stakeholders, and researchers.

INTRODUCTION

The global transition towards electric mobility has emerged as a pivotal strategy in mitigating the impacts of climate change and reducing greenhouse gas emissions. This transition, however, extends beyond the mere adoption of new technologies. It encapsulates a complex socio-political process involving a diverse array of stakeholders, including government agencies, industry players, civil society groups, and consumers. This dynamic has given rise to green politics, where environmental sustainability and social justice take center stage in policy-making decisions.

Indonesia, a rapidly developing nation with escalating energy demands, finds itself at the crossroads of this transition. Despite the potential benefits of electric vehicles in mitigating air pollution and addressing public health concerns, the dominance of fossil fuels in Indonesia's energy system persists. This persistence is not solely attributable to fluctuating global prices for these resources, but also to deeply rooted political and economic factors. For instance, vested interests in the fossil fuel industry and the lack of necessary infrastructure could pose significant hindrances.

To successfully navigate this intricate transition, it's imperative to understand the barriers that exist beyond the technological sphere. These obstacles are primarily rooted in the socio-political context, underscoring the need for a comprehensive understanding of the policy landscape for electric cars and public transport in Indonesia.

The research aims to contribute to a more sustainable and equitable transition to electric mobility in Indonesia. Grounded in the principles green politics and the stages of the policy cycle, the study seeks to add to the literature on electrification policies in developing countries. By offering insights into the potential impacts and implications of different policy priorities, the research aims to inform future policy-making and support Indonesia

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efforts to navigate its electrification journey towards a more sustainable and equitable future.

The study provides a comparative analysis of policy priorities for electric cars versus public transport in Indonesia. It reveals that the transition from fossil fuel-based vehicles to electric vehicles (EVs) and the promotion of public transport are critical strategies for addressing environmental issues and strengthening Indonesia's energy resilience. However, these transitions demand significant multi-sectoral engagement and comprehensive ecosystem development.

The research also highlights the role of public acceptance and awareness in a successful transition, indicating the need for strategic policy measures to foster a positive perception of EVs and public transport among the populace. The study underscores the need for improvements in service systems, facilities, and fares to incentivize public transportation usage, and the importance of increasing public awareness as the Indonesian public is the target audience for these programs.

In essence, the research provides a comprehensive overview of the policy landscape for electric cars and public transport in Indonesia, highlighting the complexities of the transition, the need for multi-sectoral collaboration, and the importance of aligning policy priorities with broader sustainability goals. It sets the stage for a deeper exploration of these complexities and the potential solutions to the challenges associated with the transition to electric mobility.

METHODOLOGY

The methodology employed in this research combines descriptive study and document analysis, strategies specifically chosen for their suitability in conducting a comprehensive and comparative analysis of policy priorities for electric cars and public transport in Indonesia.

The descriptive study component of our methodology is designed to provide a detailed and comprehensive overview of the current policy landscape in Indonesia. This involves a systematic examination of existing policies, initiatives, and strategies related to electric cars and public transport. By describing these policies in detail, we aim to create a clear and comprehensive picture of the current state of electric mobility in Indonesia, which serves as a foundation for our subsequent analysis.

The document analysis component, on the other hand, involves a deep dive into various policy documents, government reports, academic articles, and other relevant texts. This analysis is not merely about summarizing these documents but rather about critically examining them to uncover the underlying political ideologies and policy-making processes that are driving the electrification journey in Indonesia.

By combining these two methods, we are able not only to describe the current state of affairs but also to analyze and interpret the complex factors that are shaping policy priorities. This dual approach allows us to move beyond the surface level of policy descriptions and delve into the deeper, often hidden, dynamics of policy-making.

In essence, our methodology is designed to provide a holistic understanding of the policy landscape for electric cars and public transport in Indonesia. It allows us to explore not just what the policies are, but also why they are the way they are, and how they might evolve in the future. This comprehensive understanding is crucial for making informed recommendations for policy priorities and strategies in Indonesia's electrification journey.

Data Collection

Given the limitations of using only secondary data, the data collection process involves a thorough review of a wide range of secondary data sources. These sources include government reports, policy documents, academic articles, industry reports, and news articles. The sources were selected based on their relevance to the research questions and the credibility of the source. The data collection process was guided by the principles of systematic review, ensuring that the process was rigorous, transparent, and replicable.

Data Analysis

Following the data collection, we move to the data analysis process. This process involves two main steps. First, the data is organized and categorized based on the key themes of the research, namely the policy priorities for electric cars and public transport, the principles of green politics, and the stages of the policy cycle. This thematic analysis allows us to identify patterns and trends in the data and to draw comparisons between the policy priorities for electric cars and public transport.

Second, the data is analyzed through the lens of green politics and the policy cycle. Green politics provides a theoretical framework for understanding the environmental and social justice implications of the policy priorities. The policy cycle, on the other hand, provides a framework for understanding the processes of policy formulation, implementation, and evaluation. By applying these theoretical frameworks to the data, we can gain deeper insights

into the political ideologies and policy-making processes that underpin the policy priorities.

Limitation and Ethical Consideration

It is important to acknowledge the limitations of this methodology. The use of secondary data means that the research is dependent on the quality and availability of the existing data. Furthermore, the interpretation of the data is subject to the researchers' understanding and interpretation of the theoretical frameworks. Despite these limitations, this methodology provides a robust and systematic approach to answering the research questions.

As this research involves the use of secondary data, there are no direct ethical considerations related to participants. However, the research adheres to the principles of academic integrity, including the accurate representation of the data and the proper citation of sources.

In conclusion, the methodology outlined above, which combines descriptive study and document analysis with the theoretical frameworks of green politics and the policy cycle, sets the stage for the forthcoming results and discussion section. The insights gained from this methodological approach will guide our exploration of the policy priorities for electric cars and public transport in Indonesia, their alignment with the principles of green politics, and their evolution through the stages of the policy cycle. The next section will delve into these findings, providing a detailed analysis and discussion of the results.

RESULTS AND DISCUSSION

Preliminary Observations: Policy Directives for Electric Vehicles and Public Transport

The escalating global warming, influenced by carbon and greenhouse gas emissions, results in a rise in global temperatures. This environmental issue has been addressed at the international level through the United Nations Framework Convention on Climate Change (UNFCCC), culminating in the Paris Agreement of 2016, which outlines a mission to limit global warming [1]. Indonesia has responded to this global agenda by ratifying the Paris Agreement through UU No. 16 of 2016.

In facing environmental issues, Indonesia is initiating a transition from fossil fuel-based vehicles to battery-based vehicles, and promoting public transport as a means of controlling air pollutants. The first strategy involves accelerating the transition from fossil fuel-based vehicles to electric vehicles (EVs), either hybrid or battery-based. This strategy aims to address environmental concerns and potential resource scarcity. It also ties into the concept of achieving national energy resilience [2].

Indonesia’s dependence on fossil fuels is also an economic issue related to the supply-demand equation and the finite nature of natural resources. To tackle this imminent threat, Indonesia is promoting the use of electric vehicles. This shift is further underscored by data from the Ministry of Energy and Mineral Resources (ESDM) highlighting a decline in energy resource production, resulting in a supply deficit filled through oil imports, thus underlining Indonesia's 35% import dependence.

To enhance the transition to electric vehicles, a set of policies is necessary to stimulate public demand. Under Presidential Regulation No. 55 of 2019, the Indonesian government promotes this acceleration by providing incentives to facilitate the transition, stimulate public interest, and ensure that EVs are affordable for consumers.

These strategies are also detailed in Presidential Regulation No. 55 of 2019 which provides various incentives. Some of the primary policy measures are:

1. Tax and import tariff policies: The Indonesian government provides lower taxes and import tariffs for electric vehicles than conventional ones.
2. Electric charging infrastructure: The government ensures the availability of suitable infrastructure, particularly charging stations.
3. Subsidy and incentive programs: In addition to tax and purchase policies, the government encourages the buying of EVs by providing subsidies and tax incentives.
4. Partnerships with industry: In the context of energy management and economic considerations, the government collaborates with the industry to enhance local production of EV components.
5. Enhancing public awareness: As the target of government policies, efforts are made to raise public awareness about environmental issues arising from vehicular emissions and encourage the transition to EVs.

The Indonesian government's strategy to drive this transition involves leveraging various stakeholders. The plan encompasses a comprehensive approach that includes cheaper import incentives for production materials, tax breaks and subsidies for EV users, industry partnerships, public awareness enhancement, and infrastructure development to motivate the target consumers to make the switch.

Addressing the environmental issues and threats to our national mineral resource production necessitates a shift in transport modes, particularly towards public transportation. This transition

appears more viable and expeditious compared to electric vehicles (EVs), which demand significant multi-sectoral engagement and comprehensive ecosystem development. A similar result of the product quality but on a larger production scale.

Concentrating human mobility within public transport systems could potentially mitigate the carbon pollution and traffic congestion resulting from the existing one-person-one-vehicle paradigm [3]. The successful implementation of these changes, however, hinges on the development of policies designed to incentivize public transportation usage, particularly given Indonesians' predilection for private vehicles [4]. This necessitates stimulating public awareness through strategic policy measures, such as those exemplified by the Transjakarta service [5].

The reformation of the public transportation sector, as mandated by PMK 138 of 2022 and UU No. 22 of 2009, seeks to encourage public transport usage. This involves improving public transport services via the Buy The Service (BTS) program, currently implemented in ten Indonesian cities. The policy, accompanied by affordable transport service costs, aims to sway public preference economically. However, the policy's success and sustainability require supporting infrastructure that is pedestrian-friendly, reflecting the government's commitment to addressing carbon emissions and greenhouse gas effects.

These initiatives can help mitigate environmental problems and enhance national energy resilience, all while aiming to reduce carbon emissions, the greenhouse effect, and foster sustainability.These efforts are further bolstered by subsidies and incentives, encapsulated in policies geared towards shaping societal culture through ecosystem development. The electric vehicle ecosystem, for instance, harbors considerable potential and necessitates collaboration across various stakeholders, as specified in Presidential Decree No. 55 of 2019.

Conversely, transitioning towards public transport use is comparatively straightforward, not requiring specific infrastructure like EVs, even amidst plans for electrified public transportation. Despite some operational hurdles, the BTS program in 10 cities offers a feasible economic alternative with relatively low costs to incentivize public transportation usage. Pedestrian-friendly infrastructure enhancements also constitute an essential part of the supporting policy framework for sustainable programs.

In-depth Analysis: Implementing Green Politics and Policy Cycle Theories

In this research, the concepts of green politics and policy cycle theories serve as analytical tools. We examine two programs viewed as sustainability efforts: the initiation of electric vehicle use and the promotion of public transportation. Both efforts are rooted in addressing environmental concerns and strengthening Indonesia's energy resilience [5], [6].

The ongoing environmental issues and societal impacts are largely attributed to accelerated globalization. Rather than merely the exchange of goods and services, globalization encompasses a borderless market, facilitating flows of people, information, and resources. Four key elements of globalization include spatial expansion of socio-political and economic activities, increased interdependence due to enhanced exchange, acceleration of trade and economics, and the advanced impacts on human life [6].

In this context, globalization allows access to natural resources worldwide, resulting in significant environmental impacts - termed as 'externalities' [7]. These consequences, such as pollution and industrial waste, are central concerns of green politics, a field gaining academic interest in the wake of globalization.

Green politics emerged in the late 1960s and early 1970s in Europe when societal consciousness was raised towards environmental threats [8]. This field emphasizes prioritizing humans and Earth in economic development and critiques profitability-oriented economic actions. It leans more towards ecology than environmentalism, highlighting the need for long-term sustainable solutions [9].

According to Newell, politics can enable change affecting the environment and socio-economic life. In line with this, Scoones, Newell, and Leach [10] propose the concept of 'green transformations,' which includes five components: framing, technocentric, marketized, state-led, and citizen-led transformations. This framework offers a comprehensive approach to tackle environmental challenges.

Efforts towards green transformation in Indonesia are observed through actions such as the Presidential Decree number 55 of 2019 for electric vehicle procurement and initiatives to encourage public transportation use. This signifies the application of green transformation politics, addressing environmental issues and energy resilience concerns. Government policies, encompassing incentives, subsidies, and infrastructure development, are creating a supportive ecosystem for societal change. Government-led collaborations and resource allocation are key in fostering transformations in technology and economics, eventually driving society towards self-sustained execution of these plans.

Green transformation politics yield policies, as defined by Laswell and Kaplan, which are projected programs with specific objectives, values,

and targeted achievements. The concept of policy aligns with various goals, programs, decisions, and laws, and constitutes a choice for government action. Public policy categories include substantive and procedural, distributive and regulatory, material and symbolic, and public goods and private goods [6], [9], [10].

The policy-making process, according to Thomas R. Dye, involves stages like problem identification, agenda setting, policy formulation, legitimation, implementation, and evaluation. Modern understanding of this process uses the policy cycle stages model by Bridgman and Davis (2004), revised by Althaus, Cathrine, Peter Bridgman, & Davis, 2013. This model encapsulates eight stages: problem identification, agenda setting, policy analysis, policy instrument development, consultation, coordination, decision making, implementation, and evaluation [8], [10].

The two aforementioned policy programs are evaluated to address environmental issues through different solutions. Both, with their backgrounds in reducing carbon emissions and greenhouse gases, respond to current environmental issues. Preliminary findings suggest that ground transportation contributes significantly to carbon emissions. According to the Statistics Indonesia, as of 2021, there were 136,455,646 private vehicles and 237,566 buses. This high vehicular density results in road congestion, subsequently escalating pollutant concentration in congested areas.

These issues are addressed through programs like electric vehicle procurement, aiming to reduce carbon emissions, and public transportation to alleviate and dilute private vehicle concentrations. To date, the electric vehicle program has had better strategic penetration than public transportation. The policy instrument has accelerated this, making it a coordinated project that involves several stakeholders (ministries).

The acceleration of the implementation process is promoted to enhance public awareness about the convenience of electric vehicles, as they would experience with fossil fuel vehicles. This is apparent from the previously discussed plan involving multiple ministries, state-owned enterprises, and partnerships with industries or manufacturers producing electric vehicles. The project manifests in the procurement of charging stations at specific places such as rest areas, regional PLN offices, and car showrooms that manufacture electric vehicles. Many breakthroughs have been made to normalize the presence of electric cars, including the involvement of influencers in promotional activities.

Public transportation, on the other hand, already shares infrastructure with conventional vehicles. The essential factor that needs to be recognized and promoted is the supporting infrastructure for pedestrians, who are public transport users. Improvements in service systems, facilities, and fares should be offered to the public. This has long been implemented in Jakarta, while the pilot project for other regions began in 2020 with five initial cities as test sites for the BTS (buy the service) program offering punctual service and relatively cheap fares.

Several obstacles, particularly field-related, hinder the smooth execution of both programs. Therefore, the initial emphasis on increasing public awareness is critical because the Indonesian public is the target audience for these programs. The end goal is for the public to be able to lead transformations. Deep-rooted culture is a significant hurdle for the public. The government works on regulations and provision of public goods to encourage cultural transition. However, the government's previous policies have played a crucial role in impeding the transition process.

Comparative Analysis: Electric Cars vs Public Transport

Assessing the effectiveness of two emerging electric transportation models requires a comparative analysis of government subsidies for private electric vehicles (EVs) and public transportation. This analysis reviews subsidy models in Singapore, China, and Norway - nations that have notably supported EV production and sales.

Singapore has embarked on an environmental mission, as evidenced by their Carbon Emission-based Vehicle Scheme (CEVS). This initiative encourages citizens to adopt environmentally-friendly transportation through various incentives [11].

China's remarkable progress in personal EV adoption began with the launch of electric car sales in 2013. A comprehensive government strategy, providing vehicle purchase and operation incentives, propelled significant growth over four years [10], [11].

European nations, particularly Norway, view EVs as key to reducing greenhouse emissions and other forms of pollution. Public awareness and government incentives have significantly driven EV demand in Norway, where motor vehicles contribute to one-third of the nation's greenhouse gas emissions. By examining these distinct case studies, we gain a comprehensive perspective on policy variations and their impacts on both private EVs and public transport subsidies [8], [11].

Singapore's CEVS system reduces taxes for residents who purchase electric cars. The amount of the deduction, which can reach up to S$30,000, depends on the vehicle's carbon emissions. Additionally, high tariffs on conventional motor

vehicles serve to push residents toward electric alternatives. In contrast, China employs a top-down approach, creating national policies that include annual tax incentives and lower purchase prices. These are augmented by local incentives like reduced road tariffs and group purchase subsidies. Norway, meanwhile, subsidizes battery electric vehicles (BEVs) and offers tax incentives to their owners. This strategy has led to a surge in EV sales, which now comprise half of all car sales in Europe [11].

From the three case examples, we can conclude that these three countries have something in common, namely that the government is trying to increase the interest of vehicle users to switch from motorized vehicles to electric vehicles. The problem with these three countries is how these efforts are still not enough to solve the problems of each country. While Singapore, China, and Norway have each made significant strides toward increasing the adoption of electric vehicles (EVs), each nation faces distinct challenges in fully implementing this transition.

In Singapore, public perception is a significant barrier. Singaporeans cite high vehicle prices, charging issues, and unattractive incentives as the primary deterrents to EV ownership [8]. Interestingly, despite the potentially appealing Carbon Emission-based Vehicle Scheme (CEVS), the majority of Singaporeans favor car-sharing over personal EV ownership. Despite the presence of 60 regular and 3 fast-charging stations, only a small percentage of Singaporeans acknowledge these facilities as adequately meeting their needs.

In China, the challenges lie in infrastructural issues and the management of congestion and battery recycling [9], [10]. Although there are efforts to build charging stations, their adequacy remains questionable. Moreover, congestion has increased due to the unrestricted acquisition of EVs, which mostly lack license plates. Despite the implementation of a license plate system in large cities such as Beijing, Shanghai, and Shenzhen, severe congestion remains an issue. Lastly, the end-of-life management of EV batteries is yet to be prioritized, thus hindering the establishment of a sustainable industry.

Norway’s challenges, as outlined by Olson (2015), stem from the environmental impact of EVs not aligning with the generous government subsidies. Olson argues that the Norwegian government’s focus on the ideal use-case scenario for battery-electric vehicles (BEVs) neglects to account for other emission sources, such as carbon-fueled power plants used for charging EVs. As such, the Return on Investment (RoI) calculations are skewed. Furthermore, RoI only considers Norwegian emissions, excluding those generated internationally to support Norway's vehicle electrification. Hawkins’s research cited in Olson’s work indicates that the production of EV batteries can emit 50-125% more CO_2 than conventional vehicle manufacturing. Norway's abundant hydroelectric resources can support battery charging infrastructure, but such conditions cannot be generalized to other countries, potentially leading to higher costs for developing more sustainable power plants [10], [11].

On the other hand, about public transport incentives, the path towards widespread electric bus and rail adoption faces several challenges that require urgent policy attention. Despite the immense benefits these modes can provide in reducing congestion and emissions, transit agencies continue relying heavily on diesel buses in many cities worldwide. The high upfront price tag of electric buses gives procurement departments sticker shock, with costs running 2-3 times higher than diesel counterparts. Paying these premiums requires dipping deep into tight capital budgets, especially if it involves an entire depot or fleet.

Compounding matters, government subsidies and incentives rarely seem to close this glaring price gap. The caps placed on transit electrification subsidies pale in comparison to the generous and guaranteed perks given to private electric car owners. For example, Norway's lavish incentives take nearly $34,000 off the cost of an electric vehicle at purchase, yet public transit upgrades in Norway get a fraction of this support. Even leading the charge in Asia, Shenzhen's strong subsidies that make electric buses 70% cheaper than diesel models are the exception, not the norm.

Transit officials rightly ask - where are the incentives for us? Electric buses deserve similar usage rewards to electric cars, like driving in restricted zones or discounted tolls. Buses plying city streets keeping commuters and shoppers moving deserve similar rewards based on the public value provided, rather than just odometer readings. Even tweaks to subsidy structures, like funding a share of electric mileage travelled instead of capping at purchase, might distribute incentives more fairly.

Until the benefits and technological maturity of electric buses receive acknowledgment through policy, transit agencies will act cautiously. With diesel buses entrenched and incentive uncertainty swirling, few are willing to take the plunge into electrification. Constructing a smoother path forward requires government leadership, bold pilot projects, and steadfast incentives lasting a decade or more. Though the road is long, the destination promises reduced emissions and stronger, more liveable transit networks at the heart of communities.

Recent lifecycle assessment studies reveal that

the environmental sustainability benefits of transportation electrification are more nuanced than they may appear. While electric vehicles offer clear advantages over conventional vehicles in localized air pollutant and greenhouse gas emissions during usage, the implications are more complex when factoring in manufacturing and end-of-life impacts.

The production of lithium-ion batteries, electric motors, and other components for EVs is energetically intensive, with some estimates suggesting it can emit up to 68% higher CO2e emissions compared to manufacturing an efficient internal combustion engine vehicle [3], [5]. Furthermore, the electricity generation mix used to charge EVs influences total lifecycle emissions, with coal-dependent grids diminishing potential gains [11], [12].

However, public transportation modes like electric buses demonstrate advantages when assessed on a per kilometer-basis. Nylund and Erkkilä (2022) posit a breakeven point of just 2 years for electric buses compared to 6 years for electric cars when weighing manufacturing impacts against usage. This faster offset time is attributable to the higher annual mileage of public transit fleets. Still, further research incorporating robust usage data across geographies is imperative for comprehensive environmental impact comparisons.

Realizing the purported sustainability benefits of transportation electrification will require careful attention to system-level interactions. Grid decarbonization, battery recycling protocols, and material sourcing standards are critical considerations alongside vehicle technology improvements. Adopting a holistic lifecycle perspective allows cities to maximize environmental gains as they transition to electric mobility systems.

Beyond Borders: International Examples of Policy Failures and Their Implications for Indonesia

Examining the successes and challenges encountered by countries in implementing electric vehicle (EV) policies provides valuable insights for Indonesia as it embarks on national and local transportation electrification. Indonesia, with its large population and rich resources of nickel and lithium essential for battery production, has the potential to develop a robust EV market. However, in comparison to China, the European Union, and the United States, Indonesia lags behind in widespread EV adoption [9], [10], [11].

Through Presidential Regulation No. 15 of 2019, Indonesia initiated the electrification of private vehicles. Despite this, EVs remain sparingly used and have largely been confined to official state events, such as the G20 Meeting in Bali in 2022 and a limited Transjakarta fleet [11], [13].

Taking into account the experiences of Singapore, China, and Norway, Indonesia can focus on two primary elements to aid the transition from conventional to electric vehicles: (1) Significant incentives to encourage personal EV ownership, and (2) Development of clean power generation sources.

The first point encompasses both the readiness of EV infrastructure and the government's commitment to driving change. As of now, there are 632 charging stations and 1,184 battery swapping stations, a figure dwarfed by the government's ambitious target of having 400,000 EVs by 2025. Achieving this target requires an estimated 20,000 charging stations, implying a substantial budget allocation for EV infrastructure [13-15].

In terms of clean energy, the existing electricity supply chain used to distribute power across the country is still heavily reliant on "dirty" energy sources. As per the National Electrics Company's (PLN) records, by 2030, coal-fuelled power plants will still contribute to 45% of the total installed capacity, followed by gas power plants at 26%, hydroelectric at 15%, geothermal at 6%, solar power at 5%, and other renewables at 3% [12], [14].

Comparatively, the preparation for public transportation electrification, such as electric buses, appears more complex and time-consuming. Xie proposes the following steps to facilitate this transition: (1) Legislation providing a definitive timeline for bus electrification. (2) A progressive timeline to reach zero-emission transportation technology goals, drawing from TransJakarta's model. (3) Clear targets focusing on zero-emission technology rather than merely low-carbon transportation [16], [18], [20].

Xie contends that firm legislation and ambitious targets can make policies more effective [15]. Thus, achieving carbon emission targets may be more viable via the transition to electric public transportation rather than private EVs, considering its broader impact and governmental oversight [17-21].

Nonetheless, the government's plan for transitioning from conventional to electric vehicles, as outlined in Presidential Regulation No. 55 of 2019, presents legal challenges. Nur and Kurniawan argue that this regulation, not being linked to any law but formed to exercise government power, is a standalone legislation that is vulnerable to non-implementation with a change in ruling government [16], [19], [22].

Reflecting on the research findings and analysis, the transition towards electric vehicles (EVs) is a complex process involving multiple considerations and facets. The challenges encountered by Singapore, China, and Norway, despite their varying socio-economic backgrounds, highlight that government policies and incentives, while crucial, may not suffice to address the inherent difficulties associated with EV adoption.

The apprehensions surrounding affordability, charging infrastructure, and attractiveness of incentives indicate that public acceptance plays a vital role in a successful transition. This underscores the need to not only provide monetary incentives but also promote awareness and foster a favourable perception of EVs among the populace.

The technological and infrastructural challenges faced by these countries further emphasize the need for comprehensive planning and execution. The provision of an adequate number of charging stations, development of efficient batteries, and managing traffic congestion due to increased EVs, all point towards the need for robust infrastructure and technical advancements.

Drawing lessons from these countries, Indonesia's ambitious plans for EV adoption face similar hurdles. Despite having the potential for developing a strong EV market, a substantial gap exists in the required and existing infrastructure. Furthermore, the country's reliance on fossil fuels for power generation poses additional challenges in achieving the intended environmental benefits of EVs [18], [20], [22].

Comparatively, the electrification of public transportation might offer a more feasible approach to achieving carbon emission targets. This calls for clear and ambitious legislation with definitive timelines for the transition. However, such legislation must be underpinned by legal force to ensure its implementation, irrespective of changes in the ruling government.

In essence, the transition to electric vehicles is a multifaceted task, necessitating coordinated efforts from the government, private sector, and the public. Recognizing these challenges and devising strategies to overcome them forms a crucial step in the successful implementation of EV policies. This paper will conclude by synthesizing the key findings for Indonesia's approach to EV transition.

CONCLUSION

Summary Findings

The research presents a comprehensive analysis of Indonesia's policy priorities for electric cars and public transport within the broader context of the nation's electrification journey. It underscores the critical role of transitioning from fossil fuel-based vehicles to electric vehicles (EVs) and enhancing public transport usage in addressing environmental concerns and fortifying Indonesia's energy resilience. However, these transitions necessitate extensive multi-sectoral collaboration and comprehensive infrastructure development. The study also highlights the pivotal role of public acceptance and awareness in ensuring a successful transition, indicating the need for strategic policy measures to cultivate a positive perception of EVs and public transport among the populace.

Implications

The research findings have profound implications for policy-making in Indonesia. The apprehensions surrounding affordability, charging infrastructure, and the attractiveness of incentives underscore the importance of public acceptance in the successful transition to EVs. This necessitates not only financial incentives but also awareness campaigns to foster a positive perception of EVs among the populace.

The experiences of countries like Singapore, China, and Norway highlight the complexities of EV adoption, including infrastructure development, technological advancements, and traffic management. These challenges suggest that government policies and incentives, while crucial, may not be sufficient to address the inherent difficulties associated with EV adoption. The research suggests that the electrification of public transportation might provide a more feasible approach to achieving carbon emission targets. This approach requires clear and ambitious legislation with enforceable timelines for the transition.

The study also underscores the relevance of green politics and policy cycle theories in examining sustainability efforts. These theoretical frameworks provide valuable insights into the political ideologies and policy-making processes that underpin the policy priorities.

The research calls for comprehensive policy reforms that align with renewable energy goals and broader sustainability objectives, considering the global commitments to environmental sustainability.

Recommendation and Future Research

The research concludes with several recommendations for future research and policy-making. It suggests that the transition to electric vehicles is a multifaceted task, necessitating coordinated efforts from the government, private sector, and the public. Recognizing these challenges

and devising strategies to overcome them forms a crucial step in the successful implementation of EV policies.

The research also recommends improvements in service systems, facilities, and fares to incentivize public transportation usage. It emphasizes the importance of increasing public awareness as the Indonesian public is the target audience for these programs. The end goal is for the public to be able tolead transformations. Deep-rooted culture is a significant hurdle for the public. The government works on regulations and provision of public goods to encourage cultural transition. However, the government's previous policies have played a crucial role in impeding the transition process.

For future research, the study suggests a more in-depth exploration of the political ideologies and policy-making processes that underpin the policy priorities. It also recommends further research into the challenges and potential solutions associated with EV adoption and the promotion of public transportation. This includes research into the technological and infrastructural requirements, the economic feasibility, and the social and cultural factors influencing public acceptance and usage.

The research also highlights the need for future studies to consider the limitations of the methodology, particularly the use of secondary data, and to explore ways to overcome these limitations.

In conclusion, the research provides a roadmap for future research and policy-making in the field of electric mobility in Indonesia. It highlights the complexities of the transition, the need for multi-sectoral collaboration, and the importance of aligning policy priorities with broader sustainability goals. It also underscores the need for future research to delve deeper into these complexities and to explore innovative solutions to the challenges associated with the transition to electric mobility.

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AUTHOR CONTRIBUTION

A. J. Perdana, R. R. Tjioediningrat, S. Rizkiawan equally contributed as the main contributors of this paper. All authors read and approved the final version of the paper.

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