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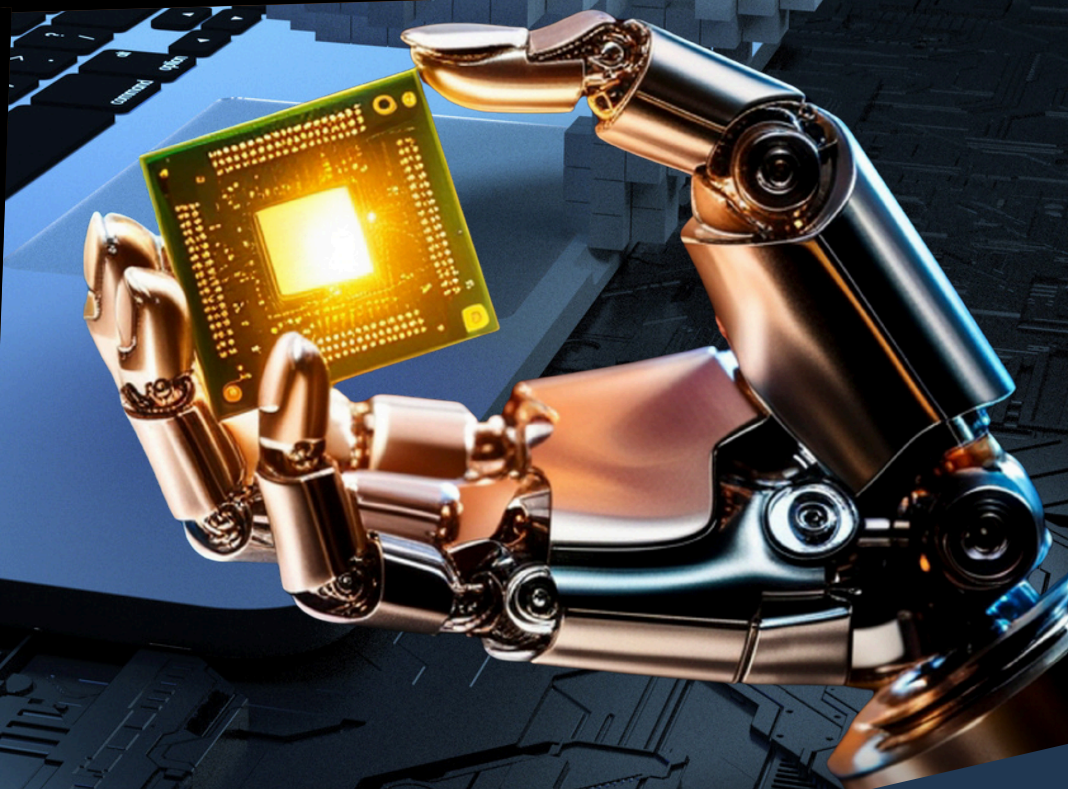


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## TABLE OF CONTENTS

Editorial Board.....	iii
1. <b>TIME FOR CHANGE: REPLACING OUTDATED VIP SPEECHES WITH MEANINGFUL ENGAGEMENT IN MALAYSIAN CEREMONIAL PROTOCOLS</b> <i>Nurliyana Abas*, Nabila Ahmad &amp; Norlizawati Md Tahir</i>	1
2. <b>PSYCHOLOGICAL ORIENTATIONS OF FOMO AND JOMO IN THE DIGITAL AGE</b> <i>Ramli Saad*, Wan Shahrul Aziah Wan Mahamad &amp; Yong Azrina Ali Akbar</i>	5
3. <b>EMBEDDING ISLAMIC ETHICAL PRINCIPLES IN EMOTIONAL INTELLIGENCE DEVELOPMENT FOR CUSTOMER SERVICE: A SCOPUS AI-BASED REVIEW</b> <i>Shakirah Mohd Saad*, Rosliza Md Zani, Abd Rasyid Ramli</i>	9
4. <b>ARTIFICIAL INTELLIGENCE (AI) IN BANK LENDING: MOVING BEYOND HEURISTIC- BASED CREDIT</b> <i>Anita Abu Hassan*</i>	14
5. <b>THE LECTURER'S ROLE IN SHAPING MEANINGFUL LEARNING</b> <i>Nurul Hayani Abd Rahman*, Rabitah Harun &amp; Nani Ilyana Shafie</i>	17
6. <b>WORK-LIFE BALANCE AND THE FUTURE OF EMPLOYEES' WELL-BEING</b> <i>Nurul Hayani Abd Rahman*, Nurul Fazila Abd Rahman &amp; Nani Ilyana Shafie</i>	20
7. <b>ECO-MICROCREDIT AS A CATALYST FOR RURAL SUSTAINABILITY</b> <i>Zuraidah Mohamed Isa*, Dahlia Ibrahim &amp; Zaiful Affendi Ahmad Zabib</i>	23
8. <b>THE ATTRACTIVENESS OF PAWNING GOLD FOR SHORT-TERM FINANCING</b> <i>Dahlia Ibrahim* &amp; Zuraidah Mohamed Isa</i>	27
9. <b>DIGITALISATION AND ECONOMIC GROWTH: INSIGHTS FROM ENDOGENOUS GROWTH THEORY</b> <i>Shahiszan Ismail*, Nor Azira Ismail &amp; Jamilah Laidin</i>	29
10. <b>SUBSIDY DELIVERY IN THE DIGITAL ERA: MALAYSIA'S HYBRID DISTRIBUTION MECHANISMS</b> <i>Anita Abu Hassan*, Syukriah Ali &amp; Najah Mokhtar</i>	33
11. <b>ENDS JUSTIFY THE MEANS: MACHIAVELLIANISM AND COUNTERPRODUCTIVE WORK BEHAVIOUR</b> <i>Mohd Najmie Osman* &amp; Nor Shuhada Mansor</i>	36
12. <b>THE SANDWICH GENERATION: EXPLORING ITS TYPES AND CONSEQUENCES</b> <i>Wan Shahrul Aziah Wan Mahamad*, Ramli Saad &amp; Yong Azrina Ali Akbar</i>	40

# GREEN INSURANCE FOR ELECTRIC VEHICLES (EV) IN MALAYSIA: EMERGING TRENDS AND CHALLENGES

Nor Razuana Amram\*

Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kedah  
[razuana@uitm.edu.my](mailto:razuana@uitm.edu.my)

Muhammad Asyraaf Hashim

Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kedah  
[asyraafhashim@uitm.edu.my](mailto:asyraafhashim@uitm.edu.my)

Anisa Irdina Basir

Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kedah  
[anisairdina2601@gmail.com](mailto:anisairdina2601@gmail.com)

\*Corresponding Author

The pace of Malaysia's sustainable mobility transition has increased significantly, confirming Electric Vehicles (EVs) as an integral part of the country's economic and environmental operational framework. This transformation is embedded in and strongly grounded in the National Energy Transition Roadmap (NETR) and the Low Carbon Mobility Blueprint (LCMB). To substantially reduce the factors driving climate change, Malaysia has recognized that transportation is the second-highest contributor. Accordingly, the government has set targets to reach 15% EV market share by 2030 and 80% by 2050 (Reyasudin Basir Khan et al., 2021; Umair et al., 2024).

Recent data demonstrate that significant progress over time has proven effective. The EV market grew slowly over the last two decades, though it has reached an 'inflection point' in 2022 (Knittel & Tanaka, 2025). By the end of 2025, Malaysia recorded substantial growth in EV registrations, peaking at 9,652 units per month in December and increasing the total EV fleet to 113,585 units. Notably, the rapid accumulation of such high-value assets warrants the development of a specialized 'Green Insurance' structure to address the risks of modern EVs. The green insurance structure refers to insurance products specifically designed for environmentally sustainable technologies and assets, as well as for risks unique to EVs. Examples include damage to batteries and charging infrastructure, as well as failures of advanced electronic systems (Hu et al., 2023; Lin, 2025). Accordingly, the EV market recorded exponential growth, with monthly registrations reaching 9,652 units in December and a cumulative fleet of 113,585 units by the end of 2025 (Umair et al., 2024). Hence, the rapid accumulation of such high-value assets warrants the formation of a specialized 'Green Insurance' structure to address the risks of modern EVs.

Furthermore, the technical and financial risks associated with EVs differ significantly from those of a conventional Internal Combustion Engine (ICE)-powered vehicle due to the high cost of specialized parts. Among these, the high-voltage battery poses the greatest risk to insurers, potentially accounting for up to 50% of the total vehicle value (Morgan, 2025). In Malaysia, while micro-EV batteries may be obtained for as low as RM 5,000, replacement costs for popular models such as the BYD Dolphin can reach up to RM 50,000, while those for more

luxury models such as the Tesla Model 3 can easily exceed RM 120,000 (Muzir et al., 2022; Nykvist & Nilsson, 2015).

Additionally, a "repairability gap" has been identified, in which even minor damage to the vehicle's undercarriage can result in the vehicle being classified as a total loss. This is primarily due to the stringent safety guidelines adopted by the vehicle manufacturers regarding battery integrity. This issue is also exacerbated by a global skills gap, with an estimated 25% or fewer repair technicians worldwide expected to be available by 2025 to repair high-voltage vehicle systems (Morgan, 2025). This situation has resulted in repair costs for EVs being 29-35% higher than for ICE vehicles.

Operating the vehicle also presents certain operational challenges that conventional insurance schemes may not fully address. For example, the EV's motor is vulnerable to damage during roadside towing. Although a gasoline engine has a fuel tank that can be replaced during towing, an EV's depleted battery requires flatbed towing (Thatcham Research, 2023). Safety risks also include thermal runaway. Although EV fires are much rarer than gasoline engine fires, such accidents are much harder to control due to the excessive heat generated and the long duration of the burn. Even minor collisions may impose considerable financial burdens if batteries are damaged in the accident. Notably, the vehicle's repair costs may exceed its market value (Ellie, 2026). For example, the greater weight of the batteries increases the risk of third-party damage (Ellie, 2026). Moreover, the charging point poses a risk of electrocution to pedestrians (Andrew, 2018).

To address these challenges, the insurance industry in Malaysia is evolving to create a well-structured ecosystem for EVs by 2026. Following the implementation of the new kilowatt-based road tax system on January 1, 2026. However, while rates remain much lower than those for ICE vehicles, the Malaysian insurance industry is moving towards achieving "product differentiation" (Visshan, 2025). Specifically, major players in the market, such as Zurich and MSIG insurance, have already introduced new EV-centric insurance covers, including Zurich's Z-Driver EV Protect, which offers protection for home wall chargers up to RM 15,000 and personal liability while charging (Chua, 2025). Furthermore, the insurance industry in Malaysia is increasingly adopting UBI (Usage-Based Insurance), setting premium rates based on the risk category of EV owners, especially in high-density areas such as the Klang Valley (Visshan, 2025).

Nevertheless, this suggests that green insurance is no longer just an added accessory. It is now a fundamental component of Malaysia's transition toward sustainable transportation. Additionally, offering insurance for these purposes helps mitigate the high cost of advanced technology and enhances safety. Hence, it will ultimately provide the "peace of mind" necessary to encourage broader public acceptance of the EV transition. As EVs become the future norm on Malaysian roads, the green insurance market plays a critical role in ensuring the shift towards environmentally sustainable practices is respectful, safe, and sensible for all Malaysians.

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