How Can Risk Management Accelerate BEV's Success Program?

Didik Kurniawan [1], Akhmad Firdiansyah [2]

[1,2]Polytechnic of State Finance STAN, Indonesia

didikur@pknstan.ac.id[1], afirdiansyah@pknstan.ac.id[2]

Abstract. The 2060 net-zero emission program might succeed, so that there is no failure of its implementation in Indonesia. Good collaboration and synergy between the government and the private sector in accelerating Battery Electric Vehicles (BEV) marketing are needed. Several issues of perceived risk have not been explored and are feared to hamper the BEV electrification ecosystem. This research focuses on the BEV program's success by employing SWOT analysis combined with risk management. An in-depth analysis using qualitative methods, relevant stakeholders were interviewed. Literature review pertaining to the issue is scrutinized. Based on the SWOT matrix, this study shows that there are several risks in the BEV program that should be paid attention to, by the government. The risks should be cautiously responded to, due to its vulnerability and its significance. Governments should prioritize to build and to develop supporting infrastructure for the BEV program.

Keywords: Risk Management; Battery Electric Vehicles (BEV); Zero Emission; SWOT Analysis; Risk Response.

1 Introduction

The use of fossil fuel-based motor vehicles, which still dominates in Indonesia, has caused the danger of increasing greenhouse gas emissions and negatively impacting the environment. To overcome this problem, the Indonesian government has set a net-zero emission target by 2060. One of the efforts made is to encourage the use of electric vehicles or Battery Electric Vehicles (BEV) in Indonesia [1].

Based on data from the Indonesia Automotive Industry Association (Gaikindo), BEV sales in Indonesia are less than 2% of total motor vehicle sales and far inferior to sales of conventional vehicles Internal Combustion Engine (ICE). The low adoption of BEVs indicates that there are still various problems existing and future risks faced in BEV sales in Indonesia [2]. In fact, the world's BEV demand and its current marketing development tend to increase significantly. This factual condition in is depicted in Figure 1 below [3].

ICONIC-RS 2024, October 03, Surakarta, Indonesia

DOI 10.4108/eai.3-10-2024.2358767

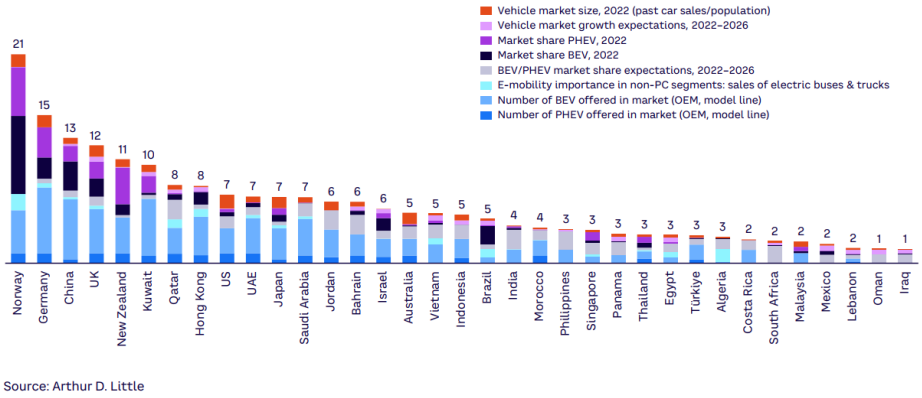

Fig. 1. Summary of market and competitive landscape. Sourced: Global Electric Mobility Readiness Index – GEMRIX Report 2023

Figure 1 shows that Indonesia's position is still ranked 5th. It means that Indonesia still has great potential marketing opportunities in the use of BEVs. The insight to be focusing on is about the factors that support and hinder the usage of BEV in Indonesia, both internally and externally. The two factors must be explored carefully in order to get a whole picture and a comprehensive condition. As a result, proper decisions could be made to leverage the effort to succeed in the BEV program.

BEV sales data compared to Internal Combustion Engine (ICE) in Indonesia sales figures are still low [4]. The ratio of BEV sales to ICE sales is less than 2% per year [5]. This condition is illustrated by Figure 2 below. Figure 2 portrays BEV car sales compared to ICE in Indonesia, from year 2019 to year 2025 (first quarter). The data collected is sourced from Gaikindo as published by Autojago [6].

CATEGORY	2019		2020		2021		2022		2023		2024		YTD. APR 2025	
	UNITS	SHARE	UNITS	SHARE	UNITS	SHARE	UNITS	SHARE	UNITS	SHARE	UNITS	SHARE	UNITS	SHARE
HEV (Hybrid Vehicle)	787	0.1%	1,191	0.2%	2,472	0.3%	10,344	1.0%	54,179	5.4%	59,903	6.9%	18,462	7.2%
PHEV (Plug In Hybrid Vehicle)	25	0.0%	8	0.0%	46	0.0%	10	0.0%	128	0.0%	136	0.0%	91	0.0%
BEV (Battery Electric Vehicle)	-	0.0%	125	0.0%	687	0.1%	10,327	1.0%	17,051	1.7%	43,188	5.0%	23,952	9.3%
Fuel Cell Electric Vehicle (FCEV)	-	0.0%	-	0.0%	-	0.0%	-	0.0%	-	0.0%	1	0.0%	-	0.0%
TOTAL X-EV	**812**	**0.1%**	**1,324**	**0.2%**	**3,205**	**0.4%**	**20,681**	**2.0%**	**71,358**	**7.1%**	**103,228**	**11.9%**	**42,505**	**16.6%**
ICE KBH2/LCGC	217,454	21.1%	104,650	19.7%	146,520	16.5%	158,206	15.1%	204,705	20.4%	176,766	20.4%	47,755	18.6%
ICE NON KBH2 (PC & CV)	814,641	78.9%	426,053	80.1%	737,477	83.1%	869,153	82.9%	729,739	72.6%	585,729	67.7%	166,108	64.8%
TOTAL ICE	**1,032,095**	**99.9%**	**530,703**	**99.8%**	**883,997**	**99.6%**	**1,027,359**	**98.0%**	**934,444**	**92.9%**	**762,495**	**88.1%**	**213,863**	**83.4%**
TOTAL MARKET	**1,032,907**	**100%**	**532,027**	**100%**	**887,202**	**100%**	**1,048,040**	**100%**	**1,005,802**	**100%**	**865,723**	**100%**	**256,368**	**100%**

Fig. 2. Indonesia Market ICE & Non ICE. Sourced: Gaikindo as published by Autojago

Based on Figure 2 above, we can conclude that the number of BEV sales in Indonesia is increasing. The market share from BEV sales could be seen by the percentage of BEV sales compare to ICE sales. From year 2020 until year 2024, this BEV market share has increased from 0% to 5%. Furthermore, in the first quarter of 2025, the market share of BEV has reached 9,3%. Based on the data, it is indicated that there is a very good signal for the sales of BEV for the future in Indonesia.

Actually, the Government of Indonesia, through the Ministry of Industry, already has a roadmap for the stages of the phase for BEV development in Indonesia until 2035. The roadmap can be seen in Table 1 below. The data in Table 1 is sourced from The Minister of Industry Regulation No. 6 Year 2022 about Specifications, Development Roadmaps, and Provisions for Calculating Domestic Component Level of Battery Electric Vehicle [7].

Table 1. BEV road map in Indonesia. Sourced: Ministry of Industry Regulation No. 6 Year 2022, adopted by researchers

Vehicles	Target 2025	Target 2030	Target 2035
4 or more wheels	400.000 units	600.000 units	1 million units
2 wheels or 3 wheels	6 million units	9 million units	12 million units

Based on Table 1 above, explicitly, Government of Indonesia has given support for the development of BEV. It is indicated by the existence of BEV target, set by the Ministry of Industry. In the short range, it is targeted by the government amount of 400.000 units of BEV in Indonesia by the end of 2025. Considering the data from Gaikindo, as shown in Figure 2 above, it is quite challenging to adopt BEV in Indonesia. Until the end of April 2025, the BEV sales is about 24 thousand units. Considering the 2025 target, it is a high risk for Government of Indonesia to meet the target.

Based on the previous discussion, the topic of BEV is quite interesting to research. There are still good prospects of developing BEV in Indonesia. However, currently the reality shows that the adoption is still minimal. This study aims to portray the possibility of risk management in revealing and treating factors related to the BEV program.

This research starts from a SWOT analysis and analyzes the involved factors through risk management concepts. Qualitative research methods is employed to identify the causes of the low adoption of BEVs in Indonesia. SWOT analysis can mitigate the strengths, weaknesses, opportunities, and threats in the development of BEVs, as well as formulate a risk management model that can be applied to increase BEV adoption in Indonesia [8].

Through this systematic and holistic approach, it is hoped that this research can make a practical and theoretical contribution to supporting the development of BEV in Indonesia as part of efforts to achieve the net-zero emission target in Indonesia. This research discusses the acceleration of the energy transition towards environmentally friendly green energy. The research objectives can be detailed as follows:

1. to analyze the current state of BEV sales in Indonesia and the factors that affect it;

2. to conduct a SWOT analysis on the development of BEVs in Indonesia to support the government's net-zero emission program; and to develop a risk management model that could be applied to increase BEV adoption in Indonesia.

2 Theoretical Background

2.1 Risk Management Theory

In this research, the literature review is dominated by reviewing secondary library materials scattered in journal literature, online newspapers, and the theories that support the research. The study materials were analyzed and synthesized qualitatively to find the truth in accordance with the research theme.

There are various definitions of risk. Initially, the Australian and New Zealand Standard for Risk Management AS/NZS 4360:2004 described risk management as a culture, process, and structure aimed at realizing potential opportunities while managing adverse impacts [9]. This definition was later updated to align with ISO 31000's definition of risk management as coordinated activities that guide and control an organization concerning risk [10]. The Institute of Internal Auditors (IIA) defines risk management as a process undertaken by an organization's management and employees, designed to manage risks in line with their risk appetite while providing sufficient assurance regarding the achievement of the entity's objectives [11]. Additionally, the Minister of Finance Regulation No. 222/PMK.01/2021 on Risk Management for State Financial Management defines risk management as a systematic and structured process supported by a risk-aware culture, aimed at managing risks at an acceptable level to ensure confidence in achieving targets [12].

From those various definitions, it can be concluded that risk management serves as a management tool for controlling and managing risks to maintain organizational success. Currently, risk management is a focal point for executives, leading many companies to implement it. It is an essential tool for managers to make optimum decisions that enhance the likelihood of success in their roles. Organizations must effectively implement risk management to safeguard against various potential risks and minimize the impact of unforeseen events [13]. Effective risk management involves proactive measures to control future outcomes rather than reactive responses.

The success of risk management implementation is influenced by several factors, including foundational skills and knowledge of risk management, commitment from management, risk management structure, and the availability of a budget for risk management activities [14]. Risk management is a systematic and realistic process for evaluating an organization's level of risk. This process includes a series of scheduled administrative steps through which the organization must execute a risk management program and monitor ongoing activities. The risk management process consists of five concurrent stages: risk identification, risk analysis, risk control, risk transfer, and risk review. According to ISO 31000:2018, several stages must be followed in the risk management process: establishing context, assessing risks, mitigating or managing risks, communicating and consulting about risks, monitoring and

reviewing risks, and recording and reporting risks [10]. The assessment stage includes three activities: identifying risks, analyzing risks, and evaluating risks.

2.2 Energy Transition Theory

Strong carbon or road pricing policies are often met with political resistance [15]. However, market-based regulations that include firm requirements alongside tradeable credits, such as zero-emissions vehicle mandates [16] or low-carbon fuel standards [17] can yield societal benefits. Policymakers and planners should be cautious, as any policy that encourages efficient (but motorized) travel without addressing actual vehicle usage may lead to a rebound effect, potentially undermining the societal advantages gained from enhanced efficiency or the adoption of low-carbon fuels. In recent years, resilience researchers have emphasized the importance of adaptive governance in understanding how societies manage and interact with ecosystems [18]. This concept includes identifying adaptive strategies for uncertain environmental risks, highlighting the necessity for societies to remain flexible in their responses to environmental challenges.

Governance encompasses all governing processes, whether executed by governments, markets, or networks, and can involve various methods such as laws, norms, power dynamics, or language [19]. Effective adaptive governance necessitates nested and networked governance structures. In contrast to traditional top-down methods, polycentricity emphasizes the importance of detailed and current bottom-up information to inform central decision-making [20].

According to Shahzad Mozin et. al., organizations exhibit various levels of responsiveness to external institutional pressures [21]. These pressures, originating from both market and non-market sources, are processed through various functional departments, influencing how managers perceive and respond to them in the context of adopting green innovation. This implies that differences in organizational management practices are not solely shaped by the intensity of institutional pressures, but also by the environmental, social, and economic performance factors specific to each country. This underscores the significance of understanding functional departments' roles in the adoption of management practices and suggests that organizations can strategically leverage these departments to navigate institutional pressures to become a leading sector.

2.3 Green Innovation

The adoption of green technologies and enforcement of regulatory policies are essential to promote and support GIA (Green Innovation Adoption) [22]. Achieving GIA demands innovative organizational strategies that transition from conventional production methods to new, sustainable practices [23]. As environmental degradation and climate change continue to intensify, driven by increasing hazardous emissions and pollution, the global push for a sustainable economy faces significant challenges [24]. However, this shift is often fraught with difficulties, as organizations must navigate numerous uncertainties and complexities throughout the transformation process [25].

The former aims to assimilate various advanced and novel technologies that can improve the existing process and products to reduce energy consumption, prevent pollution and save natural resources [24, 26, 27]. It also alludes to process and product innovation. The latter encompasses adopting/restructuring firms management strategies, i.e. environment, energy, quality management, green supply chain, and green marketing to minimize harmful environmental effects. Green Innovation (GI) is described as "hardware or software innovation that is related to green products or processes, including innovation in technologies that are involved in energy saving, pollution prevention, waste recycling, green product design, or corporate environmental management" [28, 29, 30].

Moreover, the explanation from several researchers encompasses various forms of Green Innovation (GI), including green technological innovation—which involves product and process innovations—and green nontechnological innovation, which includes management and organizational structure innovations [30, 31, 32, 33]. The former focuses on integrating advanced technologies to enhance existing processes and products, thereby reducing energy consumption, preventing pollution, and conserving natural resources [24, 26, 27]. The latter pertains to modifications in management strategies related to environmental, energy, quality management, green supply chains, and green marketing to lessen detrimental environmental effects [28, 29]. According to Chen Y.S. et. al., GI encompasses "hardware or software innovations related to green products or processes," including advancements in technologies aimed at energy conservation, pollution prevention, waste recycling, green product design, or corporate environmental management [30]. GI is viewed as a crucial driver of long-term socio-economic development.

Furthermore, organizational innovation plays a significant role in enhancing industrial exports, environmental performance, and ultimately achieving business excellence and sustainable development [22, 34]. In summary, GI tends to enhance competitiveness through the development of innovative products, processes, materials, and institutional frameworks.

3 Research Method

The approach used in this study is a descriptive qualitative method, in the form of initial data from literature and other source reviews about the research object. The data used for the study is secondary data obtained from the results of reviewing and analyzing supportive literature and other relevant sources.

In qualitative research, researchers attempt to dig up information through simple interviews with interested respondents. The main respondents in this study were several officers from the Ministry of Industry of the Republic of Indonesia. The respondents have been perceived to have some knowledge and data about BEV and its prospects in the future. In addition, respondents in this study were also interviewed about risk management for the BEV Program.

In descriptive research, researchers try to describe the situation encountered as it is, without manipulating or changing any variables being observed or studied. The approach taken in this study is based on basic theory (grounded theory), namely the existence of significance,

compatibility between theory and research object, can be generalized, can be re-examined by other researchers, and there is accuracy, precision, and can be proven empirically.

The data and information collected are analyzed and evaluated in order to find an insight. Firstly, the data and information gathered will be analyzed using a SWOT approach. By this method, the whole picture of opportunities (upside risks) and threats (downside risks) can be found. Secondly, the process is continued by analyzing the two aspects using risk management concepts. This method will sharpen the analysis in order to find the proper treatment to increase potential opportunities and to lower potential risks.

4 Results and Discussions

4.1 SWOT Analysis

The initial step in this research is to determine the internal and external analysis of problems encountered in BEV development by utilizing the SWOT (Strength, Weakness, Opportunity, and Threat) matrix. Strength and Weakness are indigenous factors that are located in the internal context of the organization. On the other hand, Opportunity and Threat are exogenous factor that originated from the external of the organization.

The analysis using SWOT concepts is conducted to enlist and to register potential problems that could endanger organizations' goals, especially the exogenous factors. By understanding the SWOT matrix, we can get complete elements that might be considered to be maximized in order for succeeding BEV Program. In the other side it also can be used in order for minimizing potential hindrances that could thwart the success of BEV program. The complete SWOT matrix for the BEV program is depicted in Table 2 below.

Table 2. SWOT Matrix Analysis Summary

IFAS / EFAS	STRENGTHS	WEAKNESSES
	Government support for the development of electric vehicles The availability of an increasingly adequate charging infrastructure Cheaper BEV operating costs compared to conventional vehicles Public awareness of the importance of using environmentally friendly vehicles is increasing	Suboptimal marketing management, especially in BEV risk mitigation Government programs that are not strong enough in anticipating the weaknesses of BEVs Limited selection of BEV models and variants available in the market The price of BEVs is still relatively expensive

		compared to conventional vehicles
OPPORTUNITIES	**S-O STRATEGY**	**W-O STRATEGY**
Government policies that are increasingly encouraging the use of BEVs	Leveraging government support and increasingly adequate charging infrastructure to expand BEV adoption in the market	Improve marketing management focused on BEV risk mitigation to drive adoption in the community
Advances in battery technology that increase BEV mileage	Promote BEV advantages such as lower operating costs to increase public awareness	Strengthening government programs in anticipating the weaknesses of BEVs to support electric vehicle development policies
Increasing public awareness of the importance of using environmentally friendly vehicles	Optimizing battery technology advancements to expand the selection of BEV models available in the market	Working with the government to provide incentives and subsidies to reduce BEV prices
The potential of the BEV market is still very large in Indonesia	-	-
THREATS	**S-T STRATEGY**	**W-T STRATEGY**
Charging infrastructure that has not been evenly distributed throughout the region	Leverage government support to expand charging infrastructure evenly	Strengthen BEV marketing management to anticipate competition with conventional vehicles
Lack of public understanding of the benefits and advantages of BEVs	Intensively conducting educational campaigns to increase public understanding of the benefits and advantages of BEVs	Working with the government to develop incentive programs and financing schemes that are more attractive to consumers
Competition with conventional vehicles that are still more affordable	Encourage the government to create comprehensive regulations to support the development of BEVs	Conduct a comprehensive risk analysis and develop a wellthought-out mitigation plan
There is no comprehensive regulation to support	-	-

the development of BEVs		

4.2 Risk Management Analysis

Risk could be simply defined as potential problems. ISO 31000:2018 stated that risk is the effect of uncertainties on objectives [9]. The word "effect" might have two consequences: positive and negative. The positive impact is known as "upside risks" and the negative effect is known as "downside risks".

By correlating those upside and downside risks to the SWOT concepts, it can be concluded that the external factors (O and T) are appropriate to be matched with risk concepts. The opportunity is related to the upside risks, while the threat is related to the downside risks. In this research, the study focuses more on downside risks than on the upside risks. It does not mean that this study neglected the potential chance to succeed BEV program, but the upside risks will be positioned as an alternative in risk treatment.

The first step in the risk assessment activities is risk identification. Risk identification will result in a list of potential hindrances that could lead to the failure of the BEV program. Based on the SWOT matrix suggested in Table 2 above, it can be simply identified "downside risks" that might happen in the future. There are five risks identified, as follows:

1. the lack of charging or power outlet infrastructure **(A)**;
2. the lack of public understanding about BEV program **(B)**;
3. the competition and challenges of conventional vehicles **(C)**;
4. the existence of negative perception from the public toward the battery used for BEV **(D)**; and
5. the lack of pro-regulation to the BEV program **(E)**.

Those five risks, then, should be analyzed further to determine its level in order to show the degree of vulnerability to the success of the BEV program. In order to determine each risk level, those five risks should be measured cumulatively by multiplying its likelihood and its impact. In order to analyze the risks, we could use a simple risk analysis matrix 3x3; with three levels of likelihood and consequences. The final step in assessing the risks is risk evaluation. By evaluating the risks, we can see the significance of each risk and come up with a risk priority that is useful for risk treatment decisions. The result of the risk assessment activities is the risk profile. The related risk profile is presented in Table 3 below.

Table 3. Risk Profile of BEV Program

No.	RISK STATEMENT	CODE	L	I	R	P	T
1.	The lack of charging or power outlet infrastructure	A	H	H	H	1	Y
2.	The lack of public understanding about BEV program	B	M	L	L	5	N

3.	The competition and challenging from conventional vehicles	C	L	M	M	4	N
4.	The existence of negative perception from public toward battery used for BEV	D	H	L	M	3	Y
5.	The lack of pro-regulation to the BEV program	E	L	H	M	2	Y

L = LIKELIHOOD ; I = IMPACTS ; R = RISK LEVEL ; P = RISK PRIORITY ; T = RISK TREATMENT ; Y = YES ; N = NO

The risk profile summarized in Table 3 above, can be depicted in the form of a risk map. The risk map functions as guidance to show the location of each risk in a risk matrix. The risk map can also show the degree of vulnerability of each risk. When a risk is located at the top right, the risk will be the top risk that should be the most paid attention on. On the other hand, when a risk is located in the lower left position, the risk can be neglected and should not have to be treated anymore. The risk map is depicted as shown in Figure 3 below.

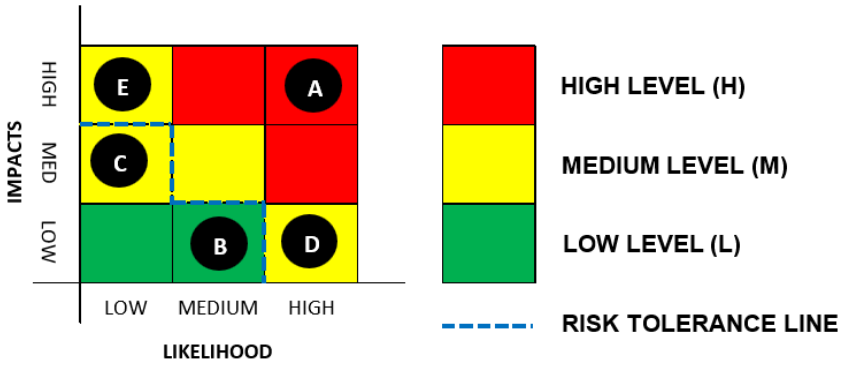

Fig. 3. Risk Map of BEV Program

Based on Figure 3 above, we can see that the five risks have its own location spread from the green zone to the red zone. One risk has a high level and only one risk with a low level. The rest of three risks have medium levels. It has also shown that two risks are located under the risk tolerance line, that means the risks should not be treated anymore. Three risks should be treated, especially the risk of the lack of infrastructure to support the BEV program. The priority risk to be responded is the risk of less infrastructure to support the success of BEV program. Factually, currently, it is still difficult to find power outlet to re-fuel vehicles, especially when the vehicles are driven to outside the city.

The risk of lack of understanding in the BEV program and the risk of challenges from conventional vehicles are located in the risk acceptance area. Therefore, these two risks are automatically accepted without any action taken to response. The risk of less supporting infrastructure has to be responded by reducing the risk. In order to prevent the risk, the government should allocate budget to build and to develop infrastructure for BEV. In the other side, in order to mitigate the risk, the government could collaborate with other parties to ensure that the infrastructure needed can be sufficiently provided.

In order to lower the likelihood (risk prevention) of the risk of negative perception toward the BEV program, the government may facilitate with campaign and could do public hearings. As a result, the public or the community will be positively well-educated toward the BEV program. In order for decreasing the impact of less regulation in the BEV program, the government can adhere with other regulation related to the BEV program. For instant, government could strengthen regulation about ESG and sustainability. Ultimately, the policy and regulations about ESG will positively affect the BEV program. It is hoped by responding to the unacceptable risk, the success possibility of BEV program could be increased.

5 Concluding Remarks

5.1 Conclusion

This research focuses on the analysis of the success of the BEV program. Firstly, SWOT analysis is employed in order to find relevant potential hindrances towards the BEV program. Secondly, risk management concepts, especially risk assessment, is taken to comprehend the analysis, including risk vulnerability and significance. Lastly, proper risk responses are proposed to reduce risk related to the BEV program.

The study aims to find potential problems and to promote action for the success of the BEV program. This research uses data and information by reviewing relevant literature. Limited discussion with several related respondents is conducted to capture the insights of opportunities and threats, that analyzed using risk assessment techniques. This study indicates there are five risks, with the top risk is the risk of limited supporting infrastructure for the BEV program. Two risks of low public understanding of the BEV program and the challenge from fossil-based vehicles are the acceptable risks without any action to respond. Risk response to the risks is by reducing the possibility and by mitigating the risks. It is hoped that by implementing the suggested action plan of risk treatment, the potential success of the BEV program could be increased.

5.2 Implication and Limitation

There are several lessons that could be learned from this study. It is shown that opportunities in the SWOT analysis relate to the upside risks. Furthermore, the threat in the SWOT analysis is similar to the downside risk concepts. As a result, threats from SWOT analysis could be analyzed further using risk management concepts. This study indicates that there is a close relationship between SWOT analysis (especially opportunities and threats) and risk management.

Based on the result of the research, by implementing SWOT analysis that resulted in the SWOT matrix, it can be identified several risks that might hinder the success of the BEV program. By implementing risk assessment and risk response mechanism, it is hoped that the probability of the BEV program success could be enlarged. This study could be as an initial

stepping stone in researching the BEV program by employing two approaches: SWOT analysis and risk management.

This research has several limitations. This research is heavily depend on the secondary data and information to be analyzed. Limited relevant respondents have also become a limitation towards the research. Therefore, it is suggested to further researchers to digging more on this issue. Future research can also be conducted by broadening the indicator of SWOT analysis and the whole activities in the risk management process.

References

[1] Singh, H., Singh, V., Singh, T., & Higueras-Castillo, E.: Electric vehicle adoption intention in the Himalayan region using UTAUT2 – NAM model (2023)

[2] Khairi, A., Putri Dika, R., Novrianto Sharma, J.: Analisis Strategi Bersaing Perusahaan Mobil Listrik pada Industri Otomotif di Indonesia. Jurnal Pendidikan Tambusai. Vol. 7, no. 1, pp. 1836-1839 (2023)

[3] Schlosser, A., Seidel, P., Khoury, R., Uchida, H., & Dakshini, A.: Global Electric Mobility Readiness Index 2023. GEMRIX Report. Retrieved from: https://www.adlittle.com/en/insights/report/global-electric-mobility-readiness-index-gemrix-2023 (2024)

[4] Yaputra, H., Kurniawati, K., Risqiani, R., Lukito, N., & Sukarno, K. P.: The Effect of Green Marketing, Sustainable Advertising, Eco Packaging/Labeling Towards Green Purchasing Behavior (Study on Electric Vehicles in Indonesia). Proceedings of the International Conference on Entrepreneurship, Leadership and Business Innovation (ICELBI 2022). Pp. 319–330. Retrieved from: https://doi.org/10.2991/978-94-6463-3504_31 (2024)

[5] Solihin, F., Yulisetiarini, D., Dina Wihelmina, I., & Rahman Wardana, F.: The Effect Of Green Marketing Strategy On Purchasing Decisions: A Review Of Previous Research. International Journal of Scientific & Technology Research. Vol 8. (2019)

[6] Harnanto, D.: *Tren Pasar Otomotif di Indonesia, Mobil Hybrid Paling Signifikan Perkembangannya*. Retrieved from https://autojago.com/news/tren-pasar-otomotif-di-indonesia-mobil-hybrid-paling-signifikan-perkembangannya (2025)

[7] The Minister of Industry Regulation No. 6 Year 2022 about Specifications, Development Roadmaps, and Provisions for Calculating Domestic Component Level of Battery Electric Vehicle. Appendix 1. (2022)

[8] Benzaghta, M.A., Elwalda, A., Mousa, M.M., Erkan. I, & Rahman, M.: SWOT Analysis Application: An Integrative Literature Review. Journal of Global Business Insights. Vol. 6, no. 1, pp. 55-73 (2021)

[9] Standard Australia: AS/NZS 4360:2004 Risk Management. Retrieved from: https://www.standards.org.au/standards-catalogue/standard-details?designation=as-nzs-4360-2004 (2024)

[10] International Standard: ISO 31000:2018 Risk Management – Guidelines. Retrieved from: https://www.iso.org/standard/65694.html (2024)

[11] The Institute of Internal Auditors: Understanding Risk Management Frameworks. Retrieved from: https://www.theiia.org/en/products/learning-solutions/on-demand/understanding-risk-management-frameworks/ (2024)

[12] Minister of Finance Regulation No. 222/PMK.01/2021: Risk Management for State Financial Management (2024)
[13] Kurniawan, D., & Mahrus, M.: The Implementation of Risk Management in Semi-Autonomous Agencies: Cases in Higher Education Institutions. In *Proceedings of the 2nd International Conference on Contemporary Risk Studies, ICONIC-RS 2023, 21-22 September 2023, Bali, Indonesia*. (2024)
[14] Kurniawan, D.: Organizational Risk Management: Basic Implementation Concepts. The Publishing Unit of Polytechnic of State Financial STAN. South Tangerang. (2023)
[15] Rhodes, E., Axsen, J., & Jaccard, M.: Exploring Citizen Support for Different Types of Climate Policy. Ecological Economics. Vol. 137, pp. 56-69 (2017)
[16] Greene, D.L., Park, S., & Liu, C.: Analyzing the transition to electric drive vehicles in the U.S. Futures. Vol. 58, pp. 34-52 (2014)
[17] Lepitzki, J., Axsen, J.: The role of a low carbon fuel standard in achieving long-term GHG reduction targets. Energy Policy. Vol. 119, pp. 423-440 (2018)
[18] Folke, C., Hahn, T., Olsson, P., & Norberg, J.: Adaptive Governance of Social-Ecological Systems. Annual Review of Environment and Resources. Vol. 30, pp. 441-473 (2005)
[19] Bevir, M.: Governance: A very short introduction. Oxford: Oxford University Press. (2013)
[20] Ostrom, E.: Polycentric Systems for Coping with Collective Action and Global Environmental Change. Global Environmental Change. Vol. 20, pp. 550-557 (2010)
[21] Shahzad, M., Qu, Y., Rehman, S.U., & Zafar, A.U.: Adoption of green innovation technology to accelerate sustainable development among manufacturing industry. Journal of Innovation & Knowledg. Vol. 7 (2022)
[22] Li, L., Msaad, H., Sun, H., Tan, M.X., Lu, Y., & Lau, A.K.W.: Green Innovation and Business Sustainability: New Evidence from Energy Intensive Industry in China. International Journal of Environmental Research and Public Health. Vol. 17(21):7826 pp. 1-18 (2020)
[23] Anser, M.K., Yousaf, Z., & Zaman, K.: Green Technology Acceptance Model and Green Logistics Operations: "To See Which Way The Wind Is Blowing". Frontiers in Sustainability. Vol. 1(3), pp. 1-9 (2020)
[24] Khan, S.J., Dhir, A., Parida, V., & Papa, A.: Past, Present, and Future of Green Product Innovation. Business Strategy and the Environment. Vol. 30 (2021)
[25] Han, M.S., & Chen, W.: Determinants of eco-innovation adoption of small and medium enterprises: An empirical analysis in Myanmar. Technological Forecasting & Social Change. Vol. 173 (2021)
[26] Fernando, Y., Jabbour, C.J.C., & Wah, W.X.: Pursuing green growth in technology firms through the connections between environmental innovation and sustainable business performance: Does service capability matter? Resources, Conservation and Recycling. Vol. 141, pp. 8-20 (2019)
[27] Xie, X., Hoang, T.T., & Zhu, Q.: Green process innovation and financial performance: The role of green social capital and customers' tacit green needs. Journal of Innovation and Knowledge. Vol. 7 (2022)
[28] Klein, S., Spieth, P., & Heidenreich, S.: Facilitating business model innovation: The influence of sustainability and the mediating role of strategic orientations. Journal of Product Innovation Management, Vol. 38 (2021)
[29] Shu, C., Zhou, K.Z., Xiao, Y., & Gao, S.: How Green Management Influences Product Innovation in China: The Role of Institutional Benefits. Journal of Business Ethics. Vol. 133, pp. 471–485 (2016)

[30] Chen, Y.S., Lai, S.B., & Wen, C.T.: The Influence of Green Innovation Performance on Corporate Advantage in Taiwan. Journal of Business Ethics. Vol. 67, pp. 331-339 (2006)
[31] Ma, Y., Hou, G., Yin, Q., Xin, B., & Pan, Y.: The sources of green management innovation: Does internal efficiency demand pull or external knowledge supply push? Journal of Cleaner Production. Vol. 202, pp. 582–590 (2018)
[32] Chang, C.H., & Chen, Y.S.: Green organizational identity and green innovation. Management Decision. Vol. 51 (2013)
[33] Hilkenmeier, F., Fechtelpeter, C., & Decius, J.: How to foster innovation in SMEs: evidence of the effectiveness of a project-based technology transfer approach. The Journal of Technology Transfer. Pp. 1-29 (2021)
[34] Wu, J., Liao, H., Wang, J.W., & Chen, T.: The role of environmental concern in the public acceptance of autonomous electric vehicles: A survey from China. Transportation Research Part F: Traffic Psychology and Behaviour. Vol. 60, pp. 37–46 (2019)