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Assessing the Viability of Converting Fuel-Based Pedicabs to Electric Pedicabs: A Case Study in Padang

Hidayat[1], Azriyenni Azhari Zakri[2], Iman Satria[3], Duskiardi[4], Arzul[5], Umair Ali[6]
[1,5]Dept. of Electrical Engineering, Faculty of Industrial Engineering Universitas Bung Hatta, Padang, Indonesia
[2]Dept. of Electrical Engineering, Faculty of Engineering Universitas Riau, Pekan Baru, Indonesia
[3,4]Dept. of Mechanical Engineering, Faculty of Industrial Engineering Universitas Bung Hatta, Padang, Indonesia
[6]Dept. of Electrical Engineering, CECOS University of IT and Emerging Science, Peshawar, Pakistan
[1]hidayat@bunghatta.ac.id, [2]azriyenni@eng.unri.ac.id, [3]iman@bunghatta.ac.id,
[4]duskiardi@bunghatta.ac.id, [5]arzul@bunghatta.ac.id, [6]engg.aliumair@gmail.com

*Corresponding author, hidayat@bunghatta.ac.id

Abstract—This study evaluates the feasibility of converting oil-powered three-wheeled pedicabs to electric vehicles to support sustainable urban transportation. The research focuses on pedicabs in Padang, which are commonly adapted from motorcycles. The feasibility assessment includes technical, financial, and demand analysis to determine the viability of the conversion. A survey was conducted among pedicab users to assess operational costs, fuel consumption, maintenance expenses, awareness of green energy, and willingness to transition to electric-powered pedicabs. The technical design involved selecting conversion components, estimating costs, and analyzing post-conversion operational expenses. The proposed electric pedicab utilizes a 2 kW, 72 V BLDC motor, with an estimated conversion cost of IDR 10 million. The operational cost before conversion is IDR 150,000 per week. Financial analysis shows that while initial operating costs for electric pedicabs are higher, they become more economical after 103 weeks. The findings indicate that the conversion is technically and financially feasible, with 53.85% of surveyed pedicab users expressing willingness to switch to electric models. This study highlights the potential to reduce fossil fuel dependence and promote environmentally friendly transportation alternatives in urban areas.

Keywords: Electric pedicab, Feasibility study, Financial analysis, Fuel-to-electric conversion, Sustainable transportation.

INTRODUCTION

Transportation has become a basic necessity for humans to move from one place to another. So that the increase in the number of people on earth will also increase the need for transportation. In Indonesia, the number of motor vehicles in 2022 reached 152.51 million units. Based on this number, as many as 126.99 million units or 83.27% of them are motorcycles [1]. An increase in the number of vehicles will increase carbon emissions, because in general existing vehicles still use Fuel Oil. In the last four years, only 0.9% of total national car sales used electric energy [2]. With the help of sensors or sensor-less algorithms, BLDC motors can deliver more precise speed and torque control compared to conventional DC motors [3]. Compared to induction motors, BLDC motors are lighter and more compact with a higher torque-to-weight ratio, making them more efficient for electric vehicle applications and household appliances [4]. With no brushes that wear out over time, BLDC motors have a longer

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lifespan and require less maintenance compared to conventional DC motors [5]. BLDC motors have a better power factor and consume less energy than conventional motors, making them an ideal choice for energy-efficient applications [6].

This means that 99.1% use fuel. Thus, it will affect the level of air pollution due to carbon emission gas produced by motor vehicles, especially in urban areas. Densely populated and lack of green belts as a source of O_2 can reduce air quality in cities. Air pollution factors in urban areas are not only determined by the number of populations, but also by the number of industries and motor vehicles. Indonesia has committed to achieving zero emissions by 2060. In the G20 Presidency event, the Indonesian government invites all G20 member countries to come up with a global solution to the problem of carbon emissions. Recently, Indonesia declared an emission reduction target. In the latest Nationally Determined Contribution (NDC) document, Indonesia raised the emission reduction target to 31.89% in 2030 with an international support target of 43.20%. Various initiatives are carried out such as increasing renewable energy sources, greening, reducing the use of plastic and others. Another field that is being intensively encouraged is the use of Electric Vehicles (EV) [7].

Electric vehicles are the future transportation that must be an option so that the air in urban areas is kept clean and environmentally friendly. It is admitted that the future challenges are quite large, because the price of electric vehicles is quite high, especially in the battery components. However, the Government encourages people to convert fuel-fueled vehicles to electric vehicles. This has been regulated by the government with the Regulation of the Minister of Transportation No. 65 of 2020 concerning the Conversion of Motorcycles with Combustion Motor Drives into Battery-Based Electric Motorcycles [8][9]. It is hoped that it can be one of the efforts to accelerate the achievement of the national motor vehicle electrification program. The main components of electric vehicles including batteries, drive motors, inverters, auxiliary power units, and on- and off-board chargers are challenges discussed by researchers [6]. Electric vehicles in Indonesia are increasing. This can be seen from EV Sales in Indonesia, which are on an increasing trend, especially since Q3 2023, driven by the emergence of affordable variants, as shown in Figure 1 [10].

Figure 1 illustrates the growth of electric vehicle (EV) sales in Indonesia from February 2021 to May 2023, highlighting the market trends of various automotive brands. The x-axis represents the timeline in months and years, while the y-axis denotes the number of EV units sold. Different colours in the bars indicate sales contributions from brands such as Wuling, Hyundai, Lexus, Nissan, Peugeot, DFSK, Mini Cooper, and Toyota. In the early period, between February 2021 and mid-2022, EV sales remained relatively low, with only a few brands, such as Hyundai and Lexus, recording minimal transactions. During this phase, the adoption of electric vehicles was still in its infancy, with limited public interest and infrastructure support. However, starting around August 2022, there was a significant surge in EV sales, marked by a steep increase in vehicle adoption. This rapid growth was predominantly driven by Wuling and Hyundai, two brands that emerged as market leaders. The sales momentum peaked in November 2022, with Wuling contributing the largest share, followed by Hyundai. Other brands, including Mini Cooper and Lexus, had minor but noticeable participation in the market. After reaching its peak in late 2022, sales fluctuated in early 2023, experiencing a slight decline in February before rebounding again by May 2023. During this period, Wuling and Hyundai continued to dominate the market, while Toyota, Mini Cooper, and other brands saw only marginal sales increases.

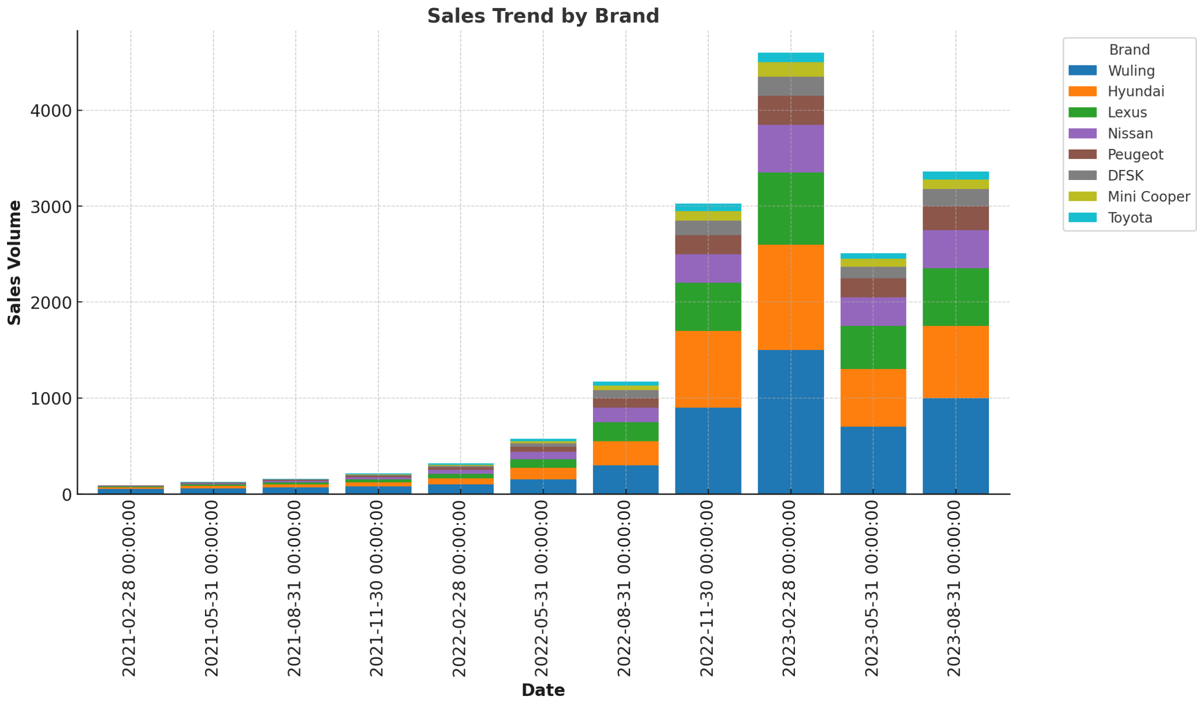

Figure 1. Development of Electric Vehicles in Indonesia

The overall trend suggests a growing acceptance of EVs in Indonesia, likely driven by government incentives, increased environmental awareness, and the introduction of more affordable electric vehicle models. The chart effectively captures the transformation of Indonesia's EV market, illustrating how a once-niche segment has expanded rapidly within a short period. The dominance of Wuling and Hyundai signifies a shift in consumer preferences toward more sustainable and cost-effective mobility solutions. Meanwhile, the participation of other brands suggests a competitive market that is gradually diversifying, paving the way for a more robust EV industry in the future. This study discusses the feasibility study of the conversion of three-wheeled vehicles. Especially pedicabs that use oil-fueled two-wheeled motorcycles to become electric vehicles. Discussions include technical, financial, social and cultural analysis. The type of electric machine that will be used as a driving force is the Brushless DC machine, because the machine has high efficiency, easy control and relatively small dimensions [12][13][14].

METHODOLOGY

A. Data Collection and Describe Analysis

Data is needed to analyze the feasibility of converting oil-fueled pedicabs to electric pedicabs. There are two data collection techniques, namely secondary data and primary data. Secondary data was obtained from documents/literature studies of the statistics office and the office/ministry of transportation. This is necessary to determine the number of vehicles in Indonesia and West Sumatra as well as government policies related to electric vehicles. Meanwhile, primary data obtained by structured interviews with motor vehicle owners, in this case pedicabs. Three-wheeled pedicabs for passenger transportation in the city of Padang generally use oil-fueled two-wheeled motorcycles as alarm machines, as shown in Figure 2. The feasibility analysis process of converting oil-fueled pedicabs to electric pedicabs begins with a literature study on the importance of encouraging the acceleration of the realization of green energy in the transportation sector and also the problem of electric vehicles and alternative solutions. Then a technical analysis of the conversion which includes the conversion component and the conversion cost. This is necessary for pedicab owners to know and measure their abilities if they want to convert their pedicabs.

Figure 2. Pedicabs made of oil-fueled motorcycles

Figure 2 depicts a traditional three-wheeled pedicab, commonly known as a *bentor* or *becak motor* in Indonesia, parked on the side of a road. The vehicle consists of a red and white motorcycle attached to a modified passenger compartment, which is designed to accommodate two to three passengers. The motorcycle itself is a modern, fuel-powered model with a sleek black seat, a sporty front fairing, and black alloy wheels. The passenger cabin, painted in a matching red and white colour scheme, features a cushioned black bench seat with a backrest, providing comfort for riders. A metal railing encircles the compartment, offering safety and support. The vehicle's frame is reinforced with sturdy metal bars, ensuring stability when in motion. The seating area is slightly elevated, allowing passengers to have a clear view of their surroundings while traveling. On the back of the passenger seat, additional storage space is visible, possibly for carrying goods or personal belongings.

The setting of the image suggests a semi-urban or suburban environment, with a tree-lined street and a narrow road that appears to be lightly trafficked. The ground is covered in dried leaves, and a few motorcycles can be seen parked in the background. The lush greenery surrounding the area provides a natural backdrop, enhancing the contrast between the vibrant colors of the pedicab and the environment. This type of modified pedicab is a popular mode of transport in Indonesia, particularly in smaller towns and cities where short-distance travel is common. It serves as a cost-effective and convenient means of transportation for local residents, often used for daily commutes, shopping trips, or carrying goods. Despite its reliance on fuel, there is an increasing push toward converting such vehicles into electric-powered alternatives to reduce carbon emissions and promote sustainable urban mobility.
The number of vehicles in West Sumatra is increasing from year to year. Based on West Sumatra transportation statistics in 2022, the total number of motorized vehicles in West Sumatra in 2021 is 2,536,335 units. This number increased by 4.73% from 2020 to 2,421,828 units. Of the 2,536,335 units, most of them are motorcycles, namely 2,118,305 (83.52%). Then, passenger cars were 278,705 units (10.99%) and freight cars were 135,086 units (5.33%). The least type of vehicle is buses with 4,239 units (0.17%), as shown Table 1. In general, these vehicles use fossil fuel oil. This leads to an increase in carbon production and a reduction in fossil energy stocks [15][16].
The technical analysis is preceded by the identification of motorcycle parameters that will be used for the pedicabs drive such as power, torque and speed. Based on data and calculation results, the components and layout of electric pedicabs components can be determined. It is

necessary to determine the position of the drive motor, main control, battery and other accessories. Furthermore, a survey was conducted on pedicab owners, to get operating costs and maintenance costs for oil-fueled pedicabs per week, as well as to obtain information on their willingness to convert to electric pedicabs. Identification of the use of oil-fueled two-wheeled motorcycles that are used as pedicabs is carried out by visiting users and submitting several celebrations. The answer is immediately filled in the google form. The questions asked include; (1) name; (2) age; (3) address; (4) handphone number; (5) occupation; (6) the function of the pedicab; (7) motorcycle brand; (8) how long have you been working driving a motorcycle pedicabs; (9) motorcycle years; (10) type of fuel used; (11) fuel consumption in a week; (12) number of family dependents; (13) 1 week's income in rupiah; (14) the willingness of his pedicab to be converted into an electric pedicab.

Table 1. Motorized Vehicle Types in West Sumatra (2017-2021)

Vehicle Type	2017	2018	2019	2020	2021
Passenger car	239.318	252.002	261.992	265.241	278.705
Bus	3.692	3.855	4.016	4.034	4.239
God car	120.291	125.415	128.992	130.326	135.086
Motorcycle	1.780.673	1.888.532	1.979.526	2.022.227	2.118.305
Number of vehicles	2.143.974	2.267.804	2.374.526	2.421.826	2.536.335

B. Basic of Data Analysis

Identify motorcycle parameters such as power, torque, speed, operating costs and other component data. Determining the power capacity of an electric motorcycle drive motor largely depends on several factors such as; resistance due to wind load, rolling resistance and detention due to graffiti force. The resistance is a reaction force that must be a parameter in determining the need for force. This force must be overcome by the driving force of the motorcycle during operation, as described below [13][14]. Drag force is the resistance that occurs due to the surface area of the front of the motorcycle. It occurs when the motorcycle runs at a certain speed, then there will be a slowdown in motion caused by aerodynamic force (F_w) sourced from drag force. The drug force is formulated with the equation (1).

$$F_w = 0,5 * (A*C_w*\rho*V^2) \tag{1}$$

Where A, C_w, ρ, dan V are the front-sectional area (m^2), wind resistance coefficient, air density (kg/m^3) and motorcycle speed (m/sec).

Rolling resistance is the resistance force on a motorcycle due to friction that occurs between the wheel and the road surface is expressed by the rolling resistance force.

$$F_r = m * g * _r \tag{2}$$

Where; m (kg), g (m/sec^2) and C_r are the mass of the bicycle and passengers, the gravitational constant and the rolling resistance coefficient.

The resistance of the graffiti force appears if the condition of the road is not horizontal. For example, in uphill road conditions, the force of gravitational resistance will appear which is formulated in equation.

$$F_g = m * g * \sin\theta \tag{3}$$

Where θ is the road slope angle. The total force (F) that occurs on the motorcycle is the sum of the three forces.

$$F = F_w + F_r + F_g \tag{4}$$

The power (P) that is required to overcome the drug force, the rolling resistance load and the load due to the gravitational force, is the sum of all the forces acting on the motorcycle multiplied by the speed of the motorcycle, as shown in equation.

$$P = F * v \tag{5}$$

The torque (T) that is generated by the motorcycle must be able to overcome all resistance forces on the motorcycle. The torque produced by this motor is formulated by equation.

$$T= P/\omega \tag{6}$$

Where ω is the angular velocity of the motorcycle wheel, formulated by equation,

$$\omega = 2\pi*n/60 \tag{7}$$

Where n is the rotational speed of the wheel (rpm), r is the length of the radius of the wheel.

The torque for the translation motion is determined by equation.

$$T = F * r \tag{8}$$

Where T = Torque (Newton-Meter), r = radius (Meter), F = Force (Newton).

RESULT AND DISCUSSION

A. Technical Analysis

Technical analysis is aimed at determining the components needed for the conversion process, so that the conversion cost is obtained. This cost is a consideration for pedicab owners in making a decision whether or not they are willing to convert to electric pedicabs. As a case study, a Honda Beat motorcycle in 2014 was chosen, which has a maximum torque of 8.68 Nm. Using wheels rim 13 Inch then the power requirement can be determined as follows;

$r = 13 * 2.54/ 2 = 16.51\ cm = 0.651\ m.$

$F = 8.8/0.51 = 52.574\ N.$

If the pedicab is designed for a maximum speed of 40 km/h, then;

$P = F * v$ = 52.574 N * 40 km/h = 2102.96 W = 2.10296 kW ≈ 2 kW

To design an electric motorcycle with a maximum speed of 40 km/h using a 13-inch wheel rim, a 2 kW Brushless DC (BLDC) motor is an appropriate choice. For higher speed requirements exceeding 40 km/h or variations in wheel diameter, the motor power capacity must be recalculated accordingly. This study considers wheel rim sizes of 13 inches, 14 inches, and 15 inches to determine suitable motor specifications. As shown in Table 2, a 1.5 kW motor is sufficient for a 15-inch wheel rim at 40 km/h. However, this configuration has reduced performance on uphill roads and may be mechanically unsuitable. Conversely, using a higher-power motor, such as a 3 kW BLDC motor, enhances both speed and the ability to handle inclines, but at a higher cost. To illustrate the relationship between motor power and maximum motorcycle speed for different wheel sizes, a graphical representation is provided in Figure 3. This visualization aids in selecting an optimal motor based on speed requirements and operational conditions.

Figure 3 is known that a larger power capacity of an electric motor is needed to obtain a larger maximum speed of a motorcycle as well. Likewise, the wheel rim also affects the speed of the motorcycle. To design a maximum motor speed of 100 km/h, a motor power of 5 kW is required for 13 Inch and 14 Inch wheels. Sometimes the torque of the motorcycle is unknown, so the determination of the power capacity of the electric drive motor can be calculated based on the total holding force when the motorcycle runs at speed (v). Based on equation (3), it is known that the angle of inclination of the road (θ) affects the graffiti force, so it needs to be considered in determining the power of the motor.

Table 2. Brushless DC Motor Power for Maximum Speed

T (Nm)	V_{max} (km/h)	Wheel, D = 13 or 14 Inch			Wheel, D = 15 Inch		
		F (N)	P (W)	Power Rating (kW)	F (N)	P (Watt)	Power Rating (kW)
8.68	40	52.5742	2102.968	2	45.5643	1822.572	1.5
8.68	50	52.5742	2628.710	2.5	45.5643	2278.215	2
8.68	60	52.5742	3154.452	3	45.5643	2733.853	2.5
8.68	70	52.5742	3680.194	3.5	45.5643	3189.501	3
8.68	80	52.5742	4205.936	4	45.5643	3645.144	3.5
8.68	90	52.5742	4731.678	4.5	45.5643	4100.787	4
8.68	100	52.5742	5257.420	5	45.5643	4556.430	4.5
8.68	120	52.5742	6308.904	6	45.5643	5467.716	5.5
8.68	130	52.5742	6834.646	6.5	45.5643	5923.359	6
8.68	140	52.5742	7360.388	7	45.5643	6379.003	6.5
8.68	150	52.5742	7886.130	8	45.5643	6834.646	7

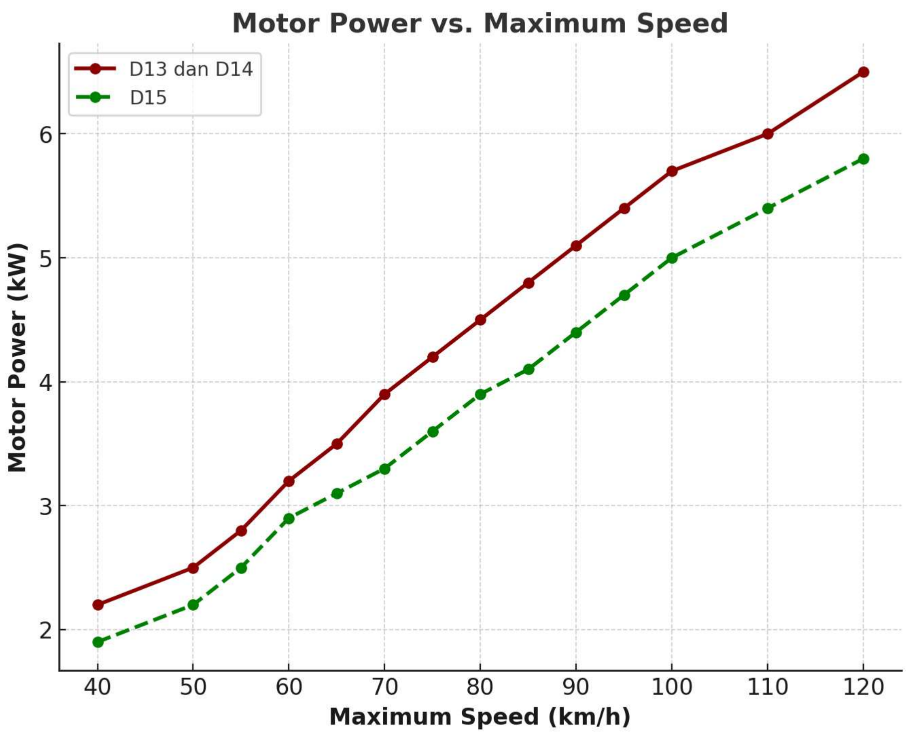

Figure 3. Electric Motor Power Selection Based on Motorcycle Maximum Speed for Various of Wheel Rim

To calculate the power capacity of the motor, the necessary data are shown in Table 3 [19]. By using equations (1) to (6), the power of the electric motor can be determined. The force resistance of the motorcycle due to wind load, for a speed of 10 km/h is calculated using equation (1).

$F_w = 0.5 * 0.5 * 0.5 * 1.226 * 102 = 15.323\ N$

The rolling resistance force is calculated using equation (2),

$F_r = 207 * 9.8 * 0.004 = 8.1144\ N$

The gravitational resistance force is calculated using equation (3) for a road slope angle of 0^0 ($\theta = 0^0$),

$F_g = 207 * 9.8 * \sin 0^0 = 0\ N$

The total resistance force is calculated using equation (4),

$F = 15.323 + 8.1144 + 0 = 23.4374\ N$

The motor drive power capacity is calculated using the equation (6),

$P = 23.4374 * 10 = 234.374\ W$

Table 3. Motor Power Capacity Calculation

Variable	Value
Front cross-sectional area of the motorcycle (A)	0.5 m^2
Wind resistance coefficient (C_w)	0.5
Air density (ρ)	1,226 kg/m^3
Motorcycle mass (m_1)	87 kg
Rider mass (m_2)	120 kg
Rolling coefficient (C_r)	0.004
Wheel rim	13 inches

The power requirement to move the motorcycle at other speeds and road angles can be calculated in the same way and the results are shown in Figure 4. It is known that if there is an increase in the speed of the motorcycle, the resistance force of the motorcycle's movement also increases exponentially. In order for the motorcycle to run at the desired speed, we need to be given power that exceeds the power that holds it back. The power of an oil-fueled motorcycle or converted to an electric motor drive. Likewise, Figure 4 shows that the ramp slot greatly determines the power capacity of the electric motor to drive the motorcycle at a speed value. The higher the slope and the higher the speed, the greater the power capacity of the electric motor is required. If a motorcycle speed of 50 km/h is desired in horizontal road conditions (θ = 0), then a 2000 Watt (2 kW) electric motor is required. By obtaining a motor power of 2 kW, components for conversion can be determined such as Brushless DC Motor, main controller, battery, battery charger, indicator display, throttle and cabling. The results of the survey in the market, the type of component and price are obtained as shown in Table 4.

Figure 4 illustrates the relationship between the speed of a motorcycle and the required motor power under different incline angles. The x-axis represents the speed of the motorcycle in kilometres per hour (km/h), while the y-axis denotes the required motor power in watts. The curves clearly depict how road inclination affects motor power consumption, emphasizing the increasing difficulty of maintaining high speeds on steeper inclines. The graph underscores the importance of selecting an appropriately powered motor for different terrains. It highlights that higher inclines drastically increase power requirements, making energy efficiency and battery capacity crucial factors in electric vehicle performance. This visualization effectively conveys the challenges faced by electric motorcycles in varying road conditions, reinforcing the need for optimized motor selection to balance speed, efficiency, and energy consumption.

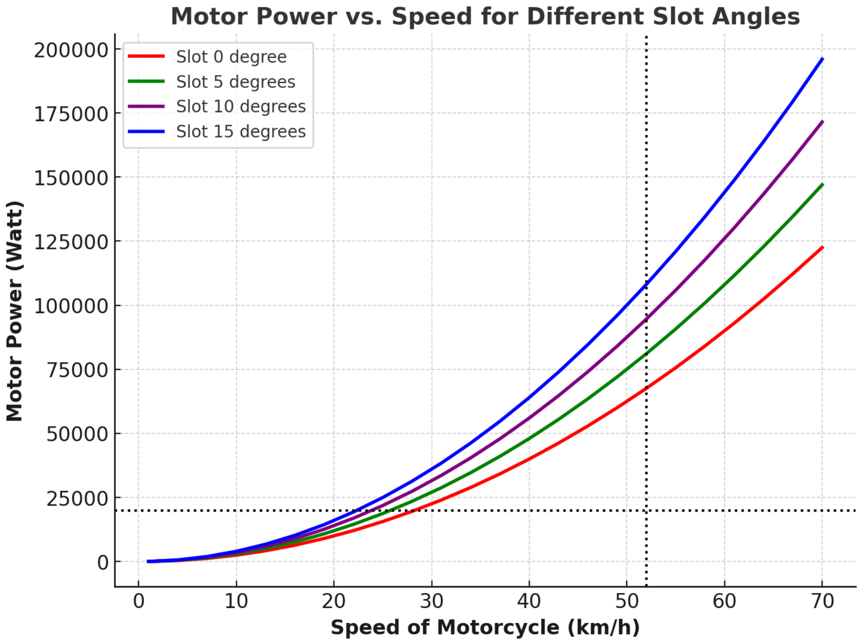

Figure 4. Power Requirements to Drive a Motorcycle at Various Road Inclinations

Table 4. Conversion Components and Prices

No	Component	Cost (IDR)
1	Electric Motor BLDC + Controller (2 kW, 72 V DC)	4,340,000
2	Battery 72 V, 25 A	4,140,000
3	Charger Baterai Lithium ion lifepo4	319,240
4	Indicator Display 48-72V Electric Motor	157,000
5	Throttle	80,000
	Sum	**IDR 9,036,240**

B. Needs Analysis

The analysis of the need for the conversion of oil-fueled pedicabs into electric pedicabs was carried out by surveying 30 points in areas that use pedicabs in the city of Padang. The target is areas where there is 3-wheeled pedicab transportation, where the pedicabs are made to use fuel-fueled two-wheeled motorcycles. Respondents were asked for a response if their pedicab-driven motorcycle was converted into an electric-powered pedicab. There were 780 respondents, of which 53.85% agreed to convert and 46.15% did not agree to convert, as shown in Figure 5. Reasons for not agreeing to be converted such as; (a) requires additional fees for the conversion process; (2) it is necessary to charge the battery every day; (3) common battery charge is not available.

Figure 5 presents the user response regarding a particular topic, likely the acceptance of converting fuel-powered pedicabs into electric pedicabs. From the data, it is evident that a majority of users, accounting for 53.85%, expressed agreement with the proposed idea. Meanwhile, 46.15% of respondents disagreed. Although the difference is not overwhelmingly large, the results suggest that more than half of the surveyed individuals support the initiative, indicating a positive reception toward the proposal. The nearly balanced distribution of opinions highlights a division in public perception. Those who agree may recognize the benefits of electric pedicabs, such as reduced fuel costs and environmental advantages. On the other hand, the significant proportion of users who disagree could be attributed to concerns about cost, infrastructure, or battery charging limitations.

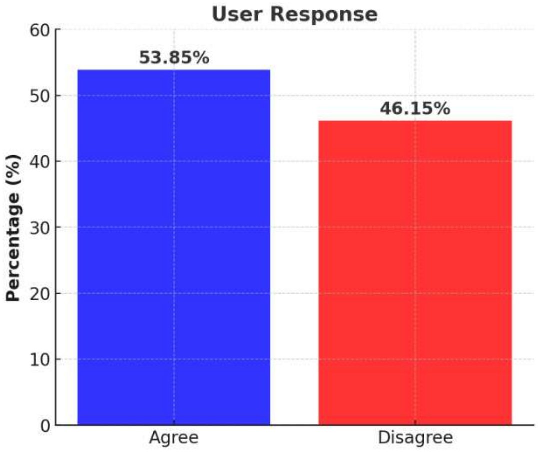

Figure 5. User Response Convert to Electricity

C. Financial Analysis

Financial analysis is intended to calculate investment costs and operational costs after conversion. The feasibility of conversion can be determined financially. Calculating cost needs is obtained from investment costs and operational costs. In the survey, it was also asked how long the pedicab operated and the fuel consumption per week. From that, operational costs per week are obtained. The data will be compared to the operating costs if using an electric pedicabs. The average Pertalite fuel consumption per week is 15 liters. The cost of Pertalite is IDR 10,000 per liter, the cost of Pertalite is IDR 150,000 per week. The investment cost is the cost for the process of converting oil-fueled pedicabs to electric pedicabs. Based on Table 4, the cost of procurement of components has been determined, which is IDR 9,036,240. By adding the cost of making the chassis and assembling, it costs around IDR 10,000,000 for the conversion process. Operational costs are the cost of electricity consumption in kWh. It is assumed that pedicabs operate 6 hours per day. Because the motor power is 2 kW, it requires 12 kWh per day. The cost for subsidized household customers with 900 VA is IDR 605 per kWh [16][17].

Figure 6 is a comparative performance and cost overview in two datasets over a period with a demonstration of how conversion has impacted them. The graph is in "blue" and is on a high starting level with a consistent upward curve. The red graph is on a lower level but with a steeper gradient. A critical intersection is found near x = 105, and is indicated with a dashed black vertical line. The converted state (blue curve) is above the original state curve in the area preceding the intersection. Following the intersection, the original state curve is above the converted state curve, suggesting that while the system in conversion is superior in the initial phase, the original system or other system tends to have greater long-run accumulation or growth. This trend would suggest that the conversion is a source of initial benefits but is not necessarily a source of increased performance and cost efficiency in the longer run. The evaluation focuses on the need to assess the short-run and longer-run implications in arriving at a decision on system conversion or process redesign.

If the electric pedicabs operate 7 days a week, the electricity cost will be IDR 50,820. Therefore, the weekly operating cost is IDR 50,820. The total cost of the converted electric pedicabs in the first week is calculated by adding the conversion cost to the operational costs for one week, amounting to IDR 10,050,820. The cost for the following weeks can be determined similarly, as depicted by the red line in Figure 6. Operational costs in the pre-conversion weeks are determined based on the outcome of a survey with a cost equal to IDR 150,000 a week (with a weekly usage rate averaging 15 liters a week of a superior grade of fuel). The operational costs in subsequent weeks are determined in a corresponding manner, as in the blue line in Figure 6. It can here be observed that in the initial weeks, say up to the 103rd week, post-conversion is high. But thereafter, post-103 weeks, post-conversion is lower than initial. Financially, what is implied here is that conversion of fuel-powered pedicab to electric pedicab is economically viable in the second year. If the conversion costs are subsidized by the government, the break-even would get realized earlier and the usage of electric vehicles would get a boost.

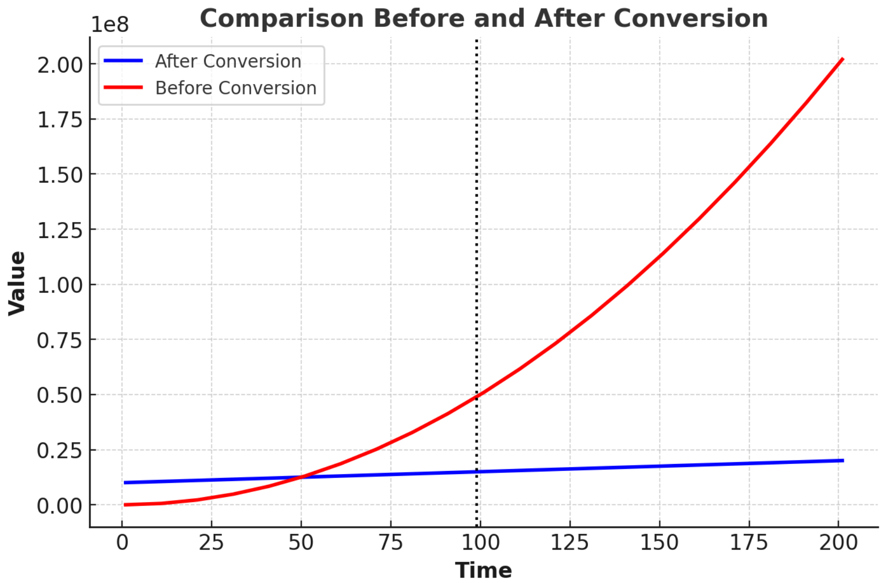

Figure 6. Compare the Cost of Pedicabs Before and After Conversion

CONCLUSION

This study assesses the feasibility of converting oil-fueled pedicabs into electric-powered vehicles by analyzing technical, financial, and market demand aspects. The technical evaluation confirms that a 2 kW, 72 V Brushless DC (BLDC) motor is an appropriate choice for conversion, ensuring adequate performance while maintaining efficiency. The estimated total conversion cost is IDR 10 million, covering the motor, controller, battery, and other essential components. From a financial perspective, while the initial operating costs of electric pedicabs are higher, they become more cost-effective after 103 weeks, making the conversion viable in the long run. A survey conducted among pedicab users in Padang reveals that 53.85% are willing to transition to electric pedicabs, indicating strong potential for adoption. This study highlights the benefits of electric pedicabs in reducing fuel dependency, lowering operational expenses, and promoting sustainable transportation. However, challenges such as high initial investment and charging infrastructure limitations must be addressed. Government incentives, including conversion subsidies and infrastructure development, could accelerate adoption and enhance feasibility for operators. Overall, this study contributes to eco-friendly urban mobility initiatives, offering a practical solution to reduce emissions and improve energy efficiency in public transportation systems.

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BIOGRAPHIES OF AUTHORS

HIDAYAT was born in Manggopoh, Agam Regency, West Sumatra Province, Indonesia, on May 31, 1970. He earned his Bachelor's degree in Electrical Engineering from Universitas Bung Hatta in 1995, followed by a Master's degree in Electrical Engineering from Institut Teknologi Bandung in 2000, and a Doctorate in Electrical Engineering from Universitas Gadjah Mada (UGM), Indonesia, in 2014. Currently, he is a faculty member at the Department of Electrical Engineering and the Department of Network Computer Engineering Technology, Faculty of Industrial Technology, Universitas Bung Padang, Indonesia. His research interests include energy conservation, renewable energy, control systems, industrial control, electric vehicles, and power system control.

AZRIYENNI AZHARI ZAKRI is a Professor at the Faculty of Engineering, Department of Electrical Engineering, Universitas Riau (UNRI). She earned her Doctorate and Master's degrees in electrical power systems from Universiti Teknologi Malaysia (UTM) in Johor Bahru, Malaysia, in 2018 and 2008, respectively, her Bachelor's degree in Electrical Engineering from Universitas Bung Hatta, Indonesia, in 1998. She is actively involved in research, community service, and scientific publications and has authored various ISBN-registered books, as well as being a certified author by the National Professional Certification Agency (BNSP). Her research focuses on Power System, Energy Conservation, PMU Measurement, Smart Grids, Distributed Generation, Artificial Intelligence, and Energy Storage.

IMAN SATRIA was born in Pekanbaru, Riau Province, Indonesia, on July 31, 1973. He completed his Bachelor's degree in Mechanical Engineering at Universitas Bung Hatta in 1996, Master's Degree in Mechanical Engineering at Institut Teknologi Bandung in 2000. Currently, he teaches at the Department of Mechanical Engineering, Faculty of Industrial Technology, Universitas Bung Padang, Indonesia. His research focuses on Turbine, Piping, Energy Conversation, Renewable Energy and vehicle.

DUSKIARDI was born in Pesisir Selatan, West Sumatera Province, Indonesia, on January 21, 1967. He completed his Bachelor's degree in Menchanical Engineering at UBH Hatta in 1995, Master's Degree in Mechanical Engineering at Universitas Indonesia in 2001. Currently, he teaches at the Department of Mechanical Engineering, Faculty of Industrial Technology, Universitas Bung Hatta (UBH) Padang, Indonesia. His research focuses on Mechanical Design, Energy Conversation, Material, and vehicle.

ARZUL was born in Padang Panjang, West Sumatra Province, Indonesia, on August 27, 1962. He completed his Bachelor's degree in Electrical Engineering at Universitas Bung Hatta in 1991, Master's Degree in Electrical Engineering at Institut Teknologi Bandung in 1998. Currently, he teaches at the Department of Electrical Engineering, Faculty of Industrial Technology, Universitas Bung Padang Padang, Indonesia. His research focuses on Power Electronic, Energy Conservation, Renewable Energy, and Power Distribution System.

UMAIR ALI received his bachelor degree (BE) from NED University of Engineering and Technology Karachi, Pakistan and Master Degree from CECOS University of IT and Emerging Sciences Peshawar, Pakistan. Since December 2015 working as Electrical Engineering in different private organisations. Research interests are Renewable Energy resources and Energy storage, Power Systems protections and Smart Grids.