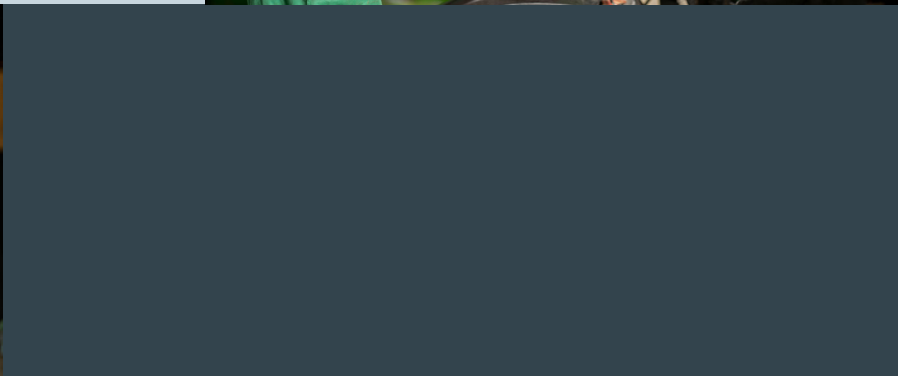
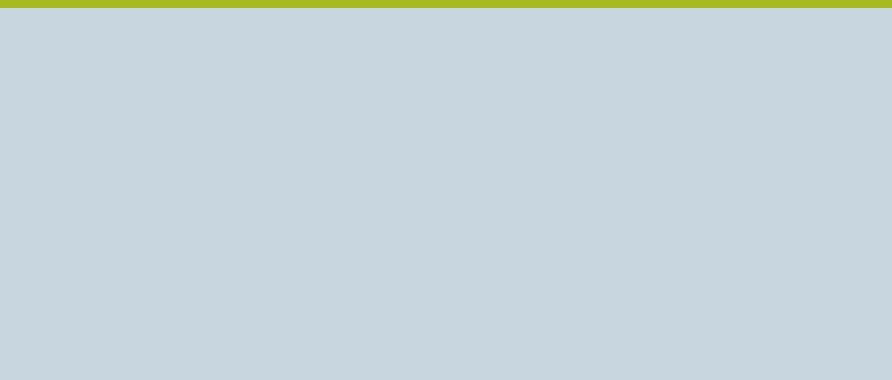


Local Assembly of Electric Motorcycles in Nigeria

Examining Cost-Effectiveness,
Component Quality, and Market
Acceptability



Imprint

Published by

Siemens Stiftung
Kaiserstraße 16
80801 München
Tel.: +49 (0) 89 / 54 04 87-0
info@siemens-stiftung.org
www.siemens-stiftung.org

Responsible for Content

Dr. Nina Smidt and Robert Balthasar

Editorial team

Orbit Electric Automobile Limited:
Kenneth Ukpabia, Ogban Ogban

Siemens Stiftung:
Sebastian Gruss

Layout

Niko Creative
90 JGO James Gichuru Road, Nairobi, Kenya
www.nikocreative.co.ke

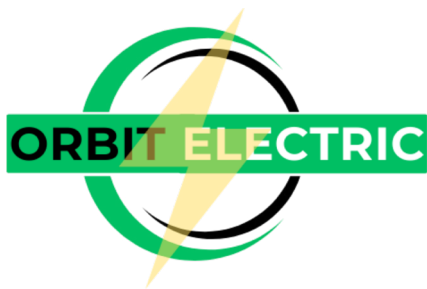
Photo Credits

©Orbit Electric Automobile Limited
©Siemens Stiftung/ WeTu

SIEMENS | Stiftung

The non-profit, internationally operative Siemens Stiftung is committed to sustainable social development. Together with individuals and communities, it creates opportunities to actively shape social and ecological transformation. It focuses on three key areas of action: Essential Services, Digitality, and Climate. By collectively addressing challenges in these fields, the foundation harnesses them as opportunities for innovation and positive change. Through projects in Education, Social Entrepreneurship, and Culture, it facilitates access and participation, strengthens future-oriented competencies, and enables interdisciplinary and collaborative learning. Siemens Stiftung connects local actions with global perspectives to support resilience, social cohesion, and regenerative practices.

www.siemens-stiftung.org



Orbit Electric Automobile Limited is passionate about powering the future with innovative and sustainable energy solutions. Based in Nigeria, the company has committed to delivering cutting-edge electrical products and services that cater to the evolving needs of our customers. Its mission is to provide reliable, efficient, and eco-friendly energy solutions that empower homes, businesses, and communities.

With a focus on quality and customer satisfaction, Orbit Electric offers a wide range of products, including solar energy systems, inverters, batteries, and other electrical accessories. The team of experienced professionals is dedicated to ensuring that every customer receives personalized solutions tailored to their unique energy requirements.

<https://orbitelectric.ng/>



Table of Contents

Executive Summary

1. Introduction

2. Methodology

2.1 Study Design and Approach

2.2 Local Content Scenarios

2.3 Study Limitations

3. Findings and Implications

4. Conclusion

Executive Summary



Moving from fully imported units to configurations with more than 25% local content reduces per-unit costs by approximately 41.3%, primarily due to the elimination of import duties and the introduction of local battery assembly.

This report evaluates the feasibility of locally assembling electric motorcycles in Nigeria, with a focus on cost efficiency, product quality, and market acceptance across different levels of local content. The analysis combines detailed cost modelling with real-world rider feedback to assess whether localization can unlock large-scale adoption of electric mobility in the commercial motorcycle sector.

The findings demonstrate that local assembly significantly improves the economic case for electric motorcycles. Moving from fully imported units to configurations with more than 25% local content reduces per-unit costs by approximately 41.3%, primarily due to the elimination of import duties and the introduction of local battery assembly. These savings create the potential for retail price reductions in the range of 15%, which survey data identifies as sufficient to trigger widespread adoption among commercial riders.

At the same time, concerns about the quality of locally produced components are not supported by the evidence. Across all tested configurations, riders report no deterioration in performance or durability as local content increases. All surveyed users confirm that locally produced components wear at the same rate or more slowly than imported alternatives. This finding removes one of the primary perceived risks associated with localization.

Market acceptance is strong but conditional. Riders clearly recognize the economic benefits of electric motorcycles in terms of lower operating and maintenance costs, and a large majority express a preference for locally assembled products. However, the high upfront cost remains a barrier, and battery performance (particularly limited range) emerges as the most significant constraint on daily usability. This issue is independent of localization levels and therefore does not undermine the case for local assembly and local production of parts.

Overall, the results indicate that local assembly, particularly when including battery assembly, is both economically and technically viable. The remaining challenge lies not in the supply chain but in improving product performance to fully meet the operational needs of commercial riders.

1 Introduction

Nigeria represents one of Africa's largest motorcycle markets, with an estimated 10–15 million units in operation, including a large share of commercial motorcycles ("okada") used for passenger transport and last-mile delivery services, particularly in urban areas such as Lagos. For many users, motorcycles are not only a means of transport but also a primary source of income, supporting livelihoods across a large segment of the population. Despite their importance, the sector is facing increasing challenges. Rising fuel prices have significantly increased operating costs, directly affecting rider profitability. At the same time, maintenance expenses remain high, and regulatory restrictions on motorcycle operations in major cities are limiting income opportunities. These developments are placing growing pressure on commercial riders and highlight the need for more cost-efficient and sustainable transport solutions.

The primary barriers to uptake are economic and structural. Electric motorcycles have significantly higher upfront costs than their internal combustion engine counterparts, placing them beyond the reach of many commercial riders. In addition, the limited availability of spare parts and trained technicians creates operational risks, while persistent perceptions of inferior quality in locally produced goods further constrain acceptance. At the same time, Nigeria's policy environment creates a strong incentive for local assembly. Electric vehicles benefit from a zero VAT regime and completely knocked down (CKD) kits imported for local assembly are exempt from customs duties. These policies create a structural advantage for locally assembled vehicles over fully imported units.

Against this backdrop, **this study examines whether local assembly can improve the affordability and acceptability of electric motorbikes in Nigeria's commercial transport sector.** It focuses on three key questions:

- whether local assembly can reduce costs sufficiently to enable broader adoption,
- whether locally produced components meet quality and durability expectations, and
- which level of local content provides the most effective balance between cost, performance, and user acceptance.



2 Methodology

2.1 Study Design and Approach



The study adopts a mixed-methods approach combining quantitative cost modelling with qualitative and quantitative analysis of rider experiences. This design enables a comprehensive assessment of both financial performance and real-world usability, reflecting the dual importance of economic viability and user acceptance in commercial transport contexts. Rather than relying solely on theoretical modelling, the study integrates empirical data from field deployment to ensure that findings are grounded in operational realities. A total of 15 commercial riders participated in the study, operating motorcycles across different local content configurations. Riders were engaged in typical commercial activities, including passenger transport and delivery services, allowing the study to capture performance under realistic usage conditions.

Rider experiences were assessed through a structured survey instrument, organized into two main analytical dimensions: **acceptability and affordability**. The acceptability dimension captures perceptions of quality, reliability, safety, usability, and overall satisfaction, while the affordability dimension focuses on purchase price perceptions, operating costs, maintenance expenses, and access to financing. Surveys were administered through one-on-one interactions in operational environments, allowing for detailed responses and clarification where necessary.

The cost analysis is based on a detailed bill-of-materials (BOM) approach. This framework captures all relevant cost elements associated with each localization scenario, including component costs, international and domestic logistics, import duties and levies, assembly labor, and overhead costs. By applying a consistent methodology across all scenarios, the analysis ensures comparability and allows for identification of key cost drivers.

2.2 Local Content Scenarios



To evaluate the impact of localization, four scenarios representing increasing levels of local content were analyzed: The **baseline scenario (0% local content)** reflects a fully imported, completely built unit (CBU), including a pre-assembled battery and was subject to standard import duties. The **10% scenario** introduces local assembly through CKD imports and substitutes two components (tires) with locally sourced alternatives. The **20% scenario** expands localization to include additional components: braking systems, brake discs, seats, handlebar and some more components. The **25%+ scenario** represents the highest level of localization examined and incorporates local battery assembly alongside all components from the 20% scenario. This progression allows for a structured comparison of how incremental localization affects cost, performance, and user perception.

2.3 Study Limitations



The study design has several limitations when interpreting the results. The relatively small sample size limits the statistical robustness of survey findings. The short deployment period further does not capture long-term performance or component degradation. In addition, the local manufacturing ecosystem remains at an early stage of development, meaning that cost structures and component quality may evolve as production scales. Economic factors, including exchange rate volatility, also introduce uncertainty into cost projections. Consequently, the findings represent a snapshot of current conditions and should be interpreted as indicative rather than predictive.

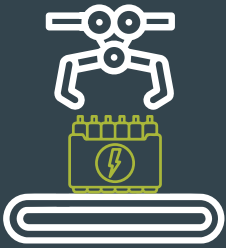


3 Findings and Implications



15%

cost reduction of approximately 31%, largely driven by the elimination of import duties through CKD assembly.



41.3%

total cost reductions reach approximately 41.3%, with battery assembly alone accounting for a substantial share of the additional savings.



31%

survey indicates that a price reduction of around 15% would be sufficient to trigger immediate adoption for a large majority of users.

The findings show that the economic benefits of localization are substantial but not linear. The transition from fully imported motorcycles to a 10% local content configuration results in a cost reduction of approximately 31%, largely driven by the elimination of import duties through CKD assembly. Increasing local content further to 20% yields only marginal additional savings, indicating that most initial gains are policy-driven rather than operational. A second, more significant step change occurs when local content exceeds 25% and includes battery assembly. At this stage, total cost reductions reach approximately 41.3%, with battery assembly alone accounting for a substantial share of the additional savings. This demonstrates that not all components contribute equally to cost efficiency, and that localization strategies must focus on high-impact elements rather than incremental increases in local content.

From a user perspective, the economic advantages of electric motorcycles are already evident. All surveyed riders report lower maintenance costs compared to petrol motorcycles, and the majority also report lower daily energy costs. These savings translate into improved daily income, confirming that the total cost of ownership is favourable even at current price levels. However, upfront cost remains a critical barrier. Most riders perceive the purchase price as high relative to their income, despite recognizing long-term savings. The survey indicates that a price reduction of around 15%



would be sufficient to trigger immediate adoption for a large majority of users. This aligns closely with the cost reductions achievable through higher levels of localization, suggesting a direct link between production strategy and market expansion.

Concerns about the quality of locally produced components are not supported by the data. Across all scenarios, riders report consistent levels of reliability and durability, with no evidence of performance degradation at higher levels of local content. This finding is particularly important, as it removes a key psychological barrier to adoption and allows localization decisions to be driven by economic considerations rather than risk mitigation.

Despite these positive results, battery performance emerges as a critical limitation. A large majority of riders report that the battery does not last long enough to cover a full working day, and no respondent considers the range more than sufficient. This issue affects overall satisfaction and directly impacts productivity, making it the primary constraint on broader adoption.

Taken together, the findings suggest that the main challenge for scaling electric motorcycles in Nigeria is not cost or quality, but product performance. Data show that localization improves affordability, remains at the same quality, and strengthens the business case. But it must be accompanied by improvements in battery capacity or charging infrastructure to fully meet user needs.

4 Conclusion



Local assembly of electric motorbikes in Nigeria represents a viable pathway to improving affordability and supporting the growth of the e-mobility sector. By combining cost reductions with strong user acceptance and supportive policy conditions, localization creates a solid foundation for scaling adoption. A phased approach to localization is recommended, focusing initially on assembly and selected components, followed by expansion into higher-impact areas such as battery assembly. This approach allows for gradual scaling while managing operational complexity. Pricing strategies should reflect the balance between affordability and sustainability. Passing on part of the cost savings to end users can support market adoption, while retaining sufficient margins enables continued investment in product improvement. Local assembly of electric motorbikes in Nigeria is both economically viable and aligned with user needs. Cost reductions, validated quality, and strong user acceptance create a solid foundation for scaling adoption.

The analysis confirms that local assembly of electric motorcycles in Nigeria is both feasible and advantageous. By leveraging favourable policy conditions and focusing on high-impact components such as battery assembly, e-mobility companies can achieve substantial cost reductions that translate directly into improved affordability. At the same time, the study demonstrates that increasing local content does not compromise product quality. Rider feedback consistently shows that locally assembled motorcycles perform at least as well as fully imported alternatives, removing a key concern associated with localization.

Market demand is clearly present, but highly sensitive to price. The ability to reduce retail prices by approximately 15% represents a critical threshold for mass adoption, and this can be achieved through strategic localization. However, cost reductions alone are not sufficient.

Battery performance remains the dominant factor affecting user satisfaction and operational viability. The implication is that localization should be pursued as part of a broader strategy that combines cost optimization with targeted product improvements.

In conclusion, local assembly is not only a viable manufacturing strategy but a key enabler of electric mobility adoption in Nigeria. Its success will depend on the ability to align economic efficiency with product performance, ensuring that electric motorcycles meet the practical needs of the riders who depend on them for their livelihoods.





Siemens Stiftung

Kaiserstraße 16
80801 Munich
Germany

siemens-stiftung.org