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Battery-Swapping for Electric Two-Wheeler Market Assessment, By End-user [Private, Commercial], By Service Type [Subscription, Pay-per-use], By Battery Type [Lithium-ion, Lead-acid], By Region, Opportunities and Forecast, 2017-2031F

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Abstracts

Global battery-swapping for electric two-wheeler market is projected to witness a CAGR of 15.45% during the forecast period 2024-2031, growing from USD 1245.54 million in 2023 to USD 3931.06 million in 2031. The market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years.

In battery swapping, electric vehicle (EV) users visit swapping stations and exchange their depleted batteries for charged ones. It minimizes drivers' range anxiety and helps resolve the issue of installing charging stations. Furthermore, leasing batteries can assist EV users in avoiding the high cost of buying batteries outright. Swapping a battery at a battery swapping point requires the least time and infrastructure, while the process may take many hours at a charging station.

The battery-swapping business is expanding due to rising global demand for efficient, long-range vehicles with minimal emissions. Continuous advancements in battery technology, the Internet of Things (IoT), and modular battery swapping technologies are expected to drive this market. Furthermore, battery switching is becoming an effective solution due to the high initial cost of EV batteries. However, manufacturers struggle to agree on common battery specifications, as battery technology is a key differentiator, and it will be difficult to swap batteries at swap stations for different models. High initial costs, differentiation in technology, and high initial set-up and operating costs further hinder the development of battery swapping stations.

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The increase in the use of two wheelers in quick delivery and daily commute in rural as well as urban areas across different regions is contributing to the rising demand of the battery swapping for electric two-wheeler market. Over time, the market is predicted to expand due to factors such as technological developments in lithium-ion batteries, increasing R&D expenditure by leading players, and rising global sales of electric two-wheelers because of strict emission norms.

For instance, in December 2023, Taiwan-based Gogoro Inc. announced an investment of USD 1.5 billion in Maharashtra, India, to build battery swapping infrastructure, including a factory to manufacture CrossOver e-scooters in partnership with Foxconn.

Increased Reliance on Micro Mobility as a Solution

The use of EVs in micro mobility is becoming more common, with many countries providing infrastructure, allocating zones in cities for service trials, and partnering with these firms to establish the country's micro mobility space. The durability and safety of shared e-scooters have increased in recent years. However, one difficulty remains, and that is the issue of recharging. While the EV industry battles with range, charging periods, and infrastructure, micro mobility may have things much easier.

For example, in July 2023, Swedish micro mobility provider Voi Technology and Berlin-based Battery-as-a-Service provider Swobbee GmbH, announced a three-year partnership to establish charging and battery-swapping stations for e-scooter sharing across Europe. Voi and Swobbee have partnered by opening two stations in Hamburg, Germany.

Market Growth Driven by Lithium-ion Battery Developments

At present, batteries constitute about 40-70% of the initial cost of an EV. This upfront cost can be shifted to the energy operators network if these batteries can be decoupled and sold or rented separately. Battery swapping and interoperability will play a significant role as they contribute to developing supply chain networks, which will enhance EV adoption and speed up the transition for zero emission transportation. Most of the electric two-wheeler sales in North America, Europe, and Asia-Pacific currently use lithium-ion (Li-ion) batteries. Government support for Li-ion battery-powered low-speed EVs is expected to help expand this segment in major countries such as China and India in the coming years. Furthermore, in the upcoming five years, almost all the two wheelers sold globally will be powered by Li-ion battery technology.

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For instance, in January 2024, Harvard John A. Paulson School of Engineering and Applied Sciences researchers created a novel lithium metal battery that can be charged and drained at least 6,000 times, which is more than any existing pouch battery cell. Furthermore, the battery can be recharged in minutes, allowing for quick charging capabilities.

Government Initiatives Acting as Catalyst

The governments of many countries are providing incentives and subsidies to manufacturers and consumers to promote the usage of electric two-wheelers and establishing battery swapping stations. Additionally, they are building the necessary infrastructure for battery swapping, especially for two-wheelers like Gogoro to set up facilities in the Philippines, and other nations such as India, China, Indonesia, and Vietnam, among others. Furthermore, increasing emission norms and ban on old ICE vehicles is influencing consumers towards EVs and leading to the growth of battery-swapping for electric two-wheeler market.

For example, in April 2022, the Government of India (GoI) released an EV battery-swapping policy with the goal of driving EV adoption by supporting the use of battery-swapping technology, which promises minimum downtime and lower upfront costs and space requirements. These types of activities, in turn, help the sector grow.

Dominance of Subscription-based Model

The subscription-based model of battery-swapping for electric two-wheeler is a highly sustainable approach and is expected to be the largest segment during the forecast period. The subscription-based model allows users to change batteries at a lower rate than the pay-per-use scenario. Most of the service providers offer this kind of battery swapping service, while providing great offers for long term users. One important aspect of the battery swapping service based on the subscription model is the number of swaps available in a month. Most two-wheeler battery swapping players provide 12-18 swaps per month, which varies depending on factors, including battery power capacity and number of batteries in a vehicle, among others.

For instance, in August 2021, KYMCO launched the Ionex Recharge, which provides on-demand battery delivery and swapping for electric scooters and motorcycles. Riders can subscribe to their battery swapping service and have their vehicle batteries swapped overnight or at a designated time and place.

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Asia-Pacific Dominates the Battery-Swapping Market

Asia-Pacific is exerting its dominance in the battery-swapping market due to the rising demand for EVs and adequate public charging infrastructure and less charging time. Countries like India, China, and Japan are witnessing a surge in innovations as many new startups and joint ventures are taking shape, thereby favoring the market growth. In China, automaker SAIC, battery maker CATL, along with two oil companies; Sinopec and China National Petroleum (CNPC), established a joint venture named Shanghai Jieneng Zhidian New Energy Technology to setup multiple battery swapping stations. Similarly, Taiwan is also contributing to the rise of battery swapping market as companies, such as Gogoro Inc., have partnered with Zypp Electric, Hero Electric, and HPCL for battery swapping stations.

Future Market Scenario (2024-2031F)

The global battery-swapping for electric two-wheeler market is expanding due to rising global demand for zero-emission vehicles.

Continuous improvements on the Internet of Things (IoT), battery technology, and modular battery swapping technologies are projected to open new prospects in the battery-swapping market.

The growing use of micro-mobility solutions, including electric scooters and cycles, is expected to significantly boost the battery swapping market, enhancing urban transportation efficiency.

Asia-Pacific is expected to dominate the global battery swap market for electric two-wheelers, with China and India leading the way. Growth in Europe is also expected due to delivery and logistics operations.

Key Players Landscape and Outlook

Key participants in the battery swapping market include Gogoro Inc., NIO Technologies, Sun Mobility, Shenzen Immotor Technology Ltd., Oyika Pte. Ltd., MO Batteries Singapore Pte Ltd., and Kwang Yang Motor Co., Ltd. These companies continuously develop battery swapping infrastructure and innovative service models to remain competitive. Mergers with research and development organizations, new product

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creation, and marketing operations to increase client awareness are all part of competitive tactics. To maintain their competitive advantage in the market, these businesses also place a high priority on adhering to rules established by local governments.

In March 2023, battery-swapping solutions supplier Esmito Solutions Pvt Ltd teamed up with EV charging services provider ElectricFuel to launch an energy-as-a-service (EaaS) platform that provides affordable battery-swapping options.

In May 2021, Gogoro Inc. teamed with two-wheeler manufacturers Yadea and DCJ to launch a new electric refueling system in China using Gogoro's battery switching technology. Vehicles created under this collaboration will use Gogoro's Powered by Gogoro Network initiative, which allows Gogoro's vehicle maker partners to connect their vehicle technology with Gogoro's intelligent drivetrains and controllers, components, and smart systems.

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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.

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