

INDUSTRY OVERVIEW

The information and statistics set out in this section and other sections of this document were extracted from different official government publications, available sources from public market research and other independent sources, and from the independent industry report prepared by Frost & Sullivan. We believe that the sources of such information are appropriate sources for such information, and we have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information and statistics are false or misleading or that any fact has been omitted that would render such information and statistics false or misleading in any material respect. The information from official government sources has not been independently verified by us, the Sole Sponsor, the [REDACTED], [REDACTED], the [REDACTED], the [REDACTED], the [REDACTED], any of their respective directors, officers, employees, advisers or agents, or any other persons or parties involved in the [REDACTED], and no representation is given as to the accuracy or completeness of such information and statistics.

SOURCE OF INFORMATION

We commissioned Frost & Sullivan, an independent market research consulting firm which is principally engaged in the provision of market consultancy services, to conduct a study of the electric two-wheeled vehicle market and electric two-wheeled vehicle service and shared mobility market. Founded in 1961, Frost & Sullivan has over 40 global offices with more than 2,000 industry consultants, market research analysts, technology analysts and economists. We agreed to pay Frost & Sullivan a fee of RMB900,000 for the preparation of the Frost & Sullivan Report. Our Directors confirm to the best of their knowledge, and after making reasonable enquiries, that there have been no material adverse changes in the industry since the date of the Frost & Sullivan Report which may qualify, contradict or have an impact on the information set out in this section.

During the preparation of the Frost & Sullivan Report, Frost & Sullivan conducted primary research that involved discussing the status of the industry with industry participants and industry experts, as well as secondary research that involved reviewing company reports, independent research reports and Frost & Sullivan’s own database. The Frost & Sullivan Report was compiled based on the following assumptions: (i) mainland China’s economy is likely to maintain steady growth in the next decade; (ii) mainland China’s social, economic, and political environment is likely to remain stable from 2022 to 2026; and (iii) increasing needs of electric two-wheeled vehicles are likely to drive the future growth of the industry. The impact of COVID-19 has been incorporated in the assumptions.

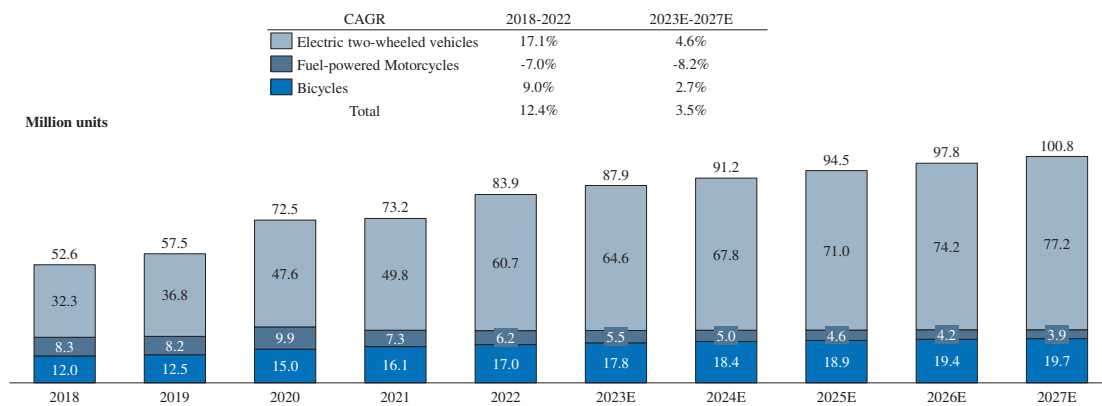
OVERVIEW OF THE TWO-WHEELED VEHICLE MARKET

Based on power types, two-wheeled vehicles can be generally segmented into three types: (i) bicycles which solely rely on rider’s physical effort for propulsion, (ii) electric two-wheeled vehicles which either combine electric power and human power or solely rely on electric

INDUSTRY OVERVIEW

power, and (iii) fuel-powered motorcycles powered by internal combustion engines fueled by gasoline or diesel. In recent years, the global and mainland China transportation sector has witnessed a paradigm shift towards sustainable and eco-friendly mobility solutions. As part of this transition, electric two-wheeled vehicles have emerged as a promising alternative to traditional fuel-powered motorcycles. Increasing environmental regulations and policies may lead to a shift in consumer preferences towards electric two-wheeled vehicles, which have lower or zero emissions and are considered more eco-friendly. As a result, electric two-wheeled vehicles are likely to keep penetrating into the market share of fuel-powered motorcycles. In 2022, total sales volume of two-wheeled vehicles reached to 83.9 million units, representing a CAGR of 12.4% from 2018 to 2022, among which the electric two-wheeled vehicles accounted for 72.3% share. Going forward, driven by favorable policies especially the emission regulations, the growth of electric two-wheeled vehicles will outpace the total two-wheeled vehicle market in mainland China, and account for 76.6% market share in 2027.

Two-wheeled Vehicle Sales Volume, Breakdown by Power Types, Mainland China, 2018-2027E



Source: China Bicycle Association, China Chamber of Commerce for Motorcycle, CAAM, Frost & Sullivan

OVERVIEW OF THE ELECTRIC TWO-WHEELED VEHICLE MARKET

Definitions and Classifications of Electric Two-wheeled Vehicles

In mainland China, electric two-wheeled vehicles are generally divided into three categories, namely, electric bicycles, electric mopeds and electric motorcycles. Electric bicycles usually retain the riding function and are comparatively light and portable. They usually resemble the look of an ordinary bicycle coated by fewer plastic parts and exposed with more vehicle frame. The battery is typically placed behind the pedal or the seat. The appearance of an electric moped is closer to that of a motorcycle, with more plastic parts coated and less vehicle frame exposed. As compared to electric bicycles, electric mopeds have larger motor power, longer driving range, and larger loading capacity. Electric motorcycles have similar appearance to that of electric mopeds, with plastic parts coating most parts of the vehicle body. Among the three categories of electric two-wheeled vehicles, electric motorcycles generally have the largest motor power and loading capacity. Electric motorcycles also have comparatively stronger

INDUSTRY OVERVIEW

braking system, and better performance overall. Specific qualification and permission are needed to produce electric mopeds and electric motorcycles. The table below sets forth the parameters and basic information of electric bicycles, electric mopeds and electric motorcycles:

	<u>Electric bicycles</u>	<u>Electric mopeds</u>	<u>Electric motorcycles</u>
<i>National Standard</i>	GB17761-2018	GB/T24158-2018	GB/T24158-2018
<i>Production Qualification</i>	No requirement	Required	Required
<i>CCC Certification</i>	Required	Required	Required
<i>Motor Power</i>	≤400W	400W-4kW	>4kW
		(non-compulsory)	(non-compulsory)
<i>Battery</i>	≤48V	No requirement	No requirement
<i>Top Speed</i>	≤25km/h	≤50km/h	>50km/h
<i>Curb Weight</i>	≤55kg	No requirement	No requirement
<i>Carriage of people</i>	One child under twelve depending on region	Prohibited	One person
<i>Driver’s License</i>	No requirement	D, E, F license	D, E License
<i>Average Retail Price for 2022 (RMB thousand)</i>	1.60	2.73	3.82

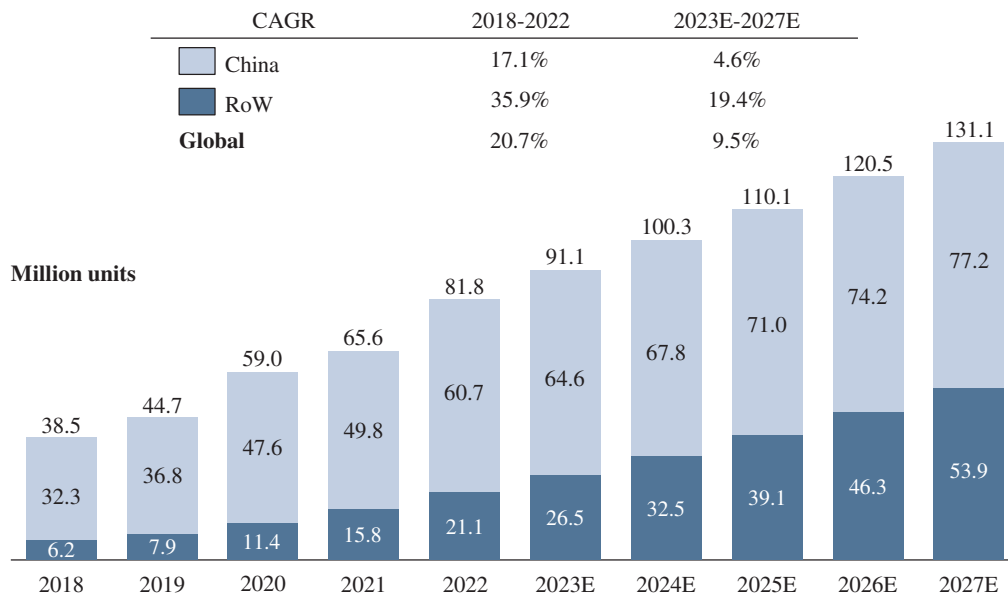
Source: Frost & Sullivan

Overview of the Global Electric Two-wheeled Vehicles Market

Sales of electric two-wheeled vehicles have grown rapidly in major global economies over the past five years, driven by emission reduction policies and the advancement of electric motor and battery technologies. Among which, mainland China is the most attractive market for electric two-wheeled vehicles with its total sales volume accounting for 74.3% of the global total sales volume in 2022. The global total sales of electric two-wheeled vehicles increased from 38.5 million units in 2018 to 74.0 million units in 2022 with a CAGR of 20.7%. In the future, major global economies are expected to put forward more stringent emission reduction policies, promoting the wider adoption of green mobilities and higher replacement ratio of traditional motorcycles. As a result, the global total sales of electric two-wheeled vehicles are expected to reach 131.1 million units in 2027 with a CAGR of 9.5% from 2023 to 2027. The following diagram illustrates the global market size of electric two-wheeled vehicles by region.

INDUSTRY OVERVIEW

Market Size of Electric Two-wheeled Vehicles, Global, 2018-2027E



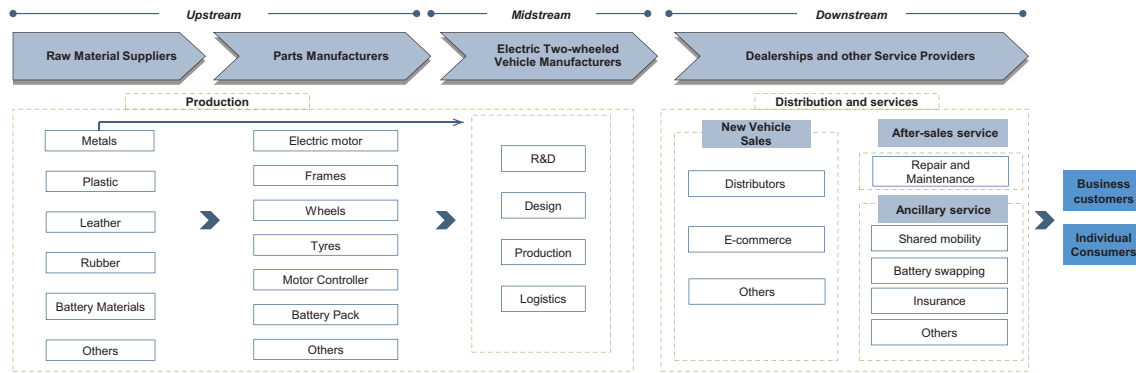
Source: Society of Manufacturers of Electric Vehicles, National Bicycle Dealers Association, Confederation of the European Bicycle Industry, The European Association of Motorcycle Manufacturers, Frost & Sullivan

Overview of the Electric Two-wheeled Vehicles Market in Mainland China

Since the passing of the New National Standards in 2019 which promoted the development of the market in the direction of standardized production and safe riding, the electric two-wheeled vehicles market in mainland China is currently in the upgrade and transformation stage. This stage is also characterized by the wider application of connectivity and smart functions which promoted the extension of the value chain and emergence of new business models such as shared mobility and value-added entertainment services. The increasing penetration rate of lithium-ion battery powered electric two-wheeled vehicles and the development of battery swapping services in this stage are expected to further improve user experience.

Participants in the value chain of electric two-wheeled vehicle in mainland China consist of raw material suppliers, parts manufacturers, electric two-wheeled vehicle manufacturers, distributors and customer service providers. Midstream manufacturers are impacted by price fluctuations of raw materials and parts as well as downstream demand and market preference. The following diagram illustrates the value chain of mainland China’s electric two-wheeled vehicle market.

INDUSTRY OVERVIEW



Mainland China’s electric two-wheeled vehicle industry had been in its mature stage for many years from 2013 to 2019 which was characterized by slower growth, higher market concentration and initial emergence of food delivery, e-commerce and on-demand delivery and smart technologies. Nevertheless, total sales volume of two-wheeled vehicles in mainland China increased from 32.3 million units in 2018 to 60.7 million units in 2022, representing a CAGR of 17.1%, as the passing of the New National Standards in 2019 promoted the phase-out of disqualified vehicles and stimulated enormous replacement demand and marked the commencement of the upgrade and transformation stage.

Pursuant to the New National Standards, electric two-wheeled vehicles that did not meet the New National Standards and was purchased before April 15, 2019 will be subject to a transition period of approximately 5 years. After the transition period, electric two-wheeled vehicles that do not meet the requirements of the New National Standards will be prohibited on road. Tier 1 and 2 cities such as Beijing, Hangzhou, and Lanzhou offered a 3-year transitional period, but other cities such as Wuxi, Tianjin, and Nanning offered a 5-year transitional period, aiming to avoid unnecessary waste of resources caused by early retirement of electric two-wheeled vehicles that do not meet the requirement of the New National Standards.

Beyond the implementation of the New National Standards and favorable policies, developing platform economy and smart technologies are also major driving factors in mainland China’s electric two-wheeled vehicle market. The prosperity of urban retailing and online shopping has generated strong demand for on-demand delivery service, where electric two-wheeled vehicles are widely used by, for example, courier and delivery service providers, due to efficiency and flexibility. Additionally, the application of new technologies such as AI and connectivity can realize new functions or features such as real-time location, navigation, smart battery management systems and security functions, which will boost the performance of electric two-wheeled vehicles and attract more customers from younger generations. As a result, with the New National Standards playing a key role in driving the large-scale demand for replacement and upgrading of electric two-wheeled vehicles in mainland China since April 2019 coupled with these factors, the sales volume of electric two-wheeled vehicles in mainland China in 2022 reached 60.7 million units with a high CAGR of 17.1% as compared to that in 2018 and mainland China achieved status as the largest electric two-wheeled vehicle market in the world.

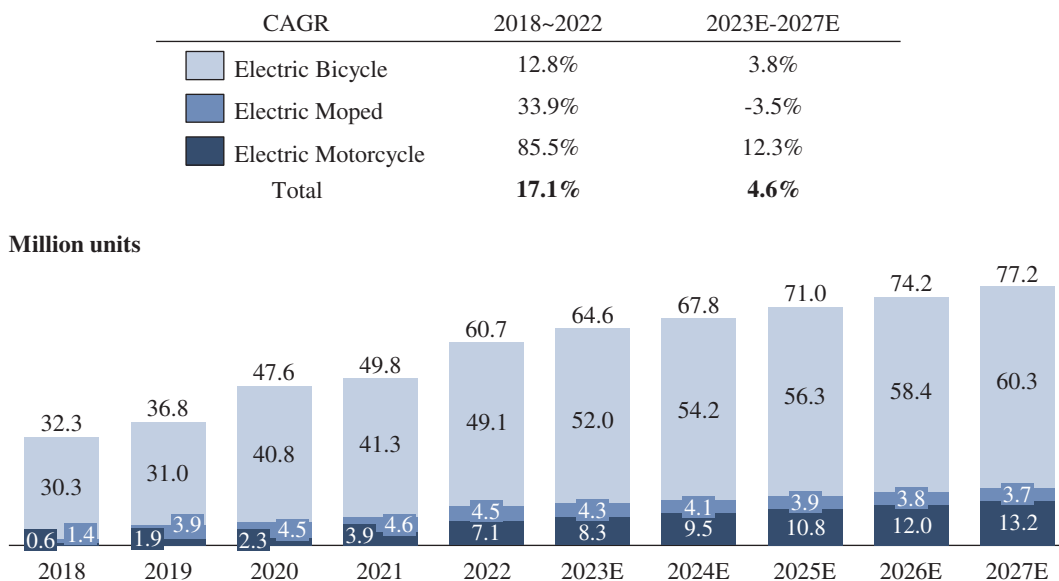
INDUSTRY OVERVIEW

However, large-scale vehicle replacement needs could decrease after the New National Standards has been fully implemented, and as the market matures and evolves, signs of a slowdown are becoming apparent. With the expanding customer base from both business side and individual consumer side, total sales volume of electric two-wheeled vehicles market in mainland China is expected to reach 77.2 million units in 2027, albeit with a contrastingly lower CAGR of 4.6% from that in 2023.

Nevertheless, while it should be noted that the growth rate of 4.6% in the forecast period is contrastingly lower than 17.1% in the historical period, due in part to the high base of mainland China’s electric two-wheeled vehicle market size, the overall scale and the market space of mainland China’s electric two-wheeled vehicle market remain considerable. On the other hand, under the impetus of the New National Standards, the electric two-wheeled vehicle market will turn into benign competition focusing on product quality and brand power. Small and medium-sized manufacturers without strong research and development capabilities and manufacturing and sales network capabilities will be gradually eliminated. Leading companies will gain more obvious competitive advantages by virtue of their own strength.

The following diagram illustrates the market size of electric two-wheeled vehicles of mainland China.

Electric Two-wheeled Vehicle Sales Volume, Mainland China, 2018-2027E



Source: China Bicycle Association, China Chamber of Commerce for Motorcycle, CAAM, Frost & Sullivan

Mainland China’s electric two-wheeled vehicle market is highly concentrated with top nine manufacturers accounting for over 80% market share. As such, it is expected that leading players such as our Group is more likely to benefit from the total market growth of the industry and are better positioned to take advantage of industry upgrade, specifically, the stronger growth of the premium segment described below. Electric two-wheeled vehicles can be divided into entry level, medium level and premium level based on manufacturer suggested retail price

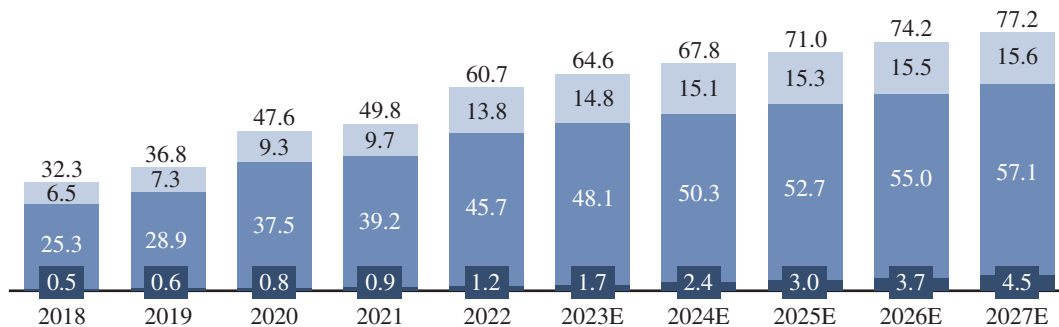
INDUSTRY OVERVIEW

(“MSRP”). Entry level mostly comprise electric bicycles with only basic functions, small battery, relatively short driving range and very limited or no AI or connectivity features. Medium level electric two-wheeled vehicles take up the largest share of this market and covers all three types of electric two-wheeled vehicles. Premium electric two-wheeled vehicles segment is an emerging segment in mainland China, and mainly contains electric motorcycles and a small share of electric mopeds and electric bicycles. Premium vehicles usually have better performance such as larger motor power, larger lithium-ion battery with longer driving range and are also typically equipped with more advanced AI and connectivity features.

Electric Two-wheeled Vehicle Sales Volume, Breakdown by Market Positioning, Mainland China, 2018-2027E

CAGR	2018~2022	2023E-2027E
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 10px; background-color: #d9e1f2; margin-right: 5px;"></div> Entry (MSRP<RMB1,500) </div>	20.7%	1.3%
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 10px; background-color: #4f81bd; margin-right: 5px;"></div> Medium (RMB1,500≤MSRP<RMB3,500) </div>	15.9%	4.4%
<div style="display: flex; align-items: center;"> <div style="width: 15px; height: 10px; background-color: #2d3748; margin-right: 5px;"></div> Premium (MSRP≥RMB3,500) </div>	24.5%	27.6%
Total	17.1%	4.6%

Million units

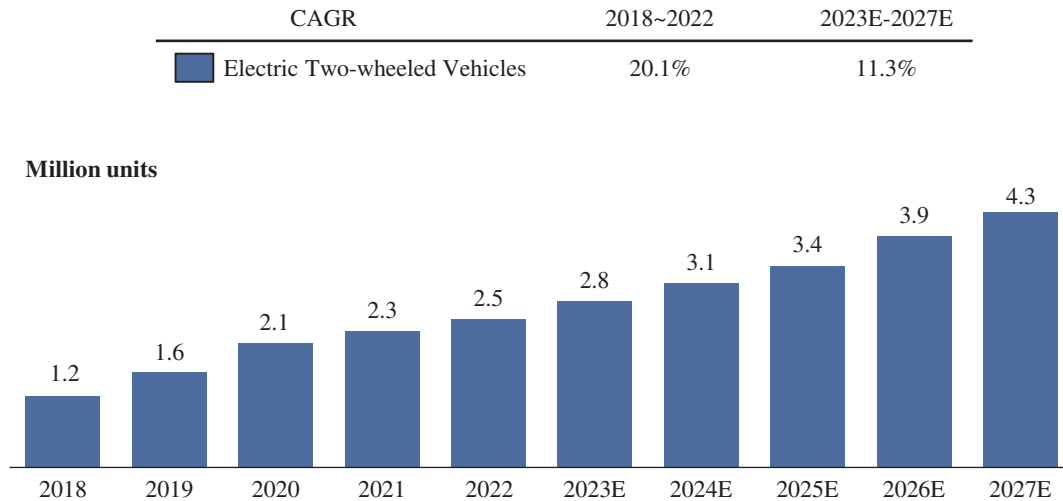


Source: China Bicycle Association, China Chamber of Commerce for Motorcycle, China Association of Automobile Manufacturers, Frost & Sullivan

China is the largest production country of electric two-wheeled vehicles in the world. Apart from domestic sales, a significant share of vehicles produced in mainland China is exported to overseas markets, such as Europe and ASEAN. From 2018 to 2022, mainland China’s export volume of electric two-wheeled vehicles increased from 1.2 million units to 2.5 million units, representing a CAGR of 20.1%. Going forward, driven by carbon neutral strategies and green mobility policies in overseas markets such as Europe, ASEAN and India, the phase-out of traditional motorcycle is expected to accelerate while the demand for electric two-wheeled vehicles will continue to grow. Moreover, social distancing policies in relation to the COVID-19 pandemic across the globe have helped foster habits of using electric-wheeled vehicles. Furthermore, the on-demand delivery market developed quickly in many regions especially in ASEAN and India, which will also stimulate the demand for electric two-wheeled vehicles. According to Frost & Sullivan, the total export volume of electric two-wheeled vehicles is expected to increase from 2.8 million units in 2023 to 4.3 million units in 2027, representing a double-digit CAGR of 11.3%.

INDUSTRY OVERVIEW

Electric Two-wheeled Vehicle Export Volume, Mainland China, 2018-2027E



Source: General Administration of Customs, Frost & Sullivan

KEY DEVELOPMENT DRIVERS AND MARKET OPPORTUNITIES

Favorable policies: To achieve the peak of carbon dioxide emissions and carbon neutrality in the next 40 years is a major strategic decision taken by the PRC government, and it has implemented a series of policies to support or regulate the healthy and rapid development of green mobility, including the electric two-wheeled vehicle industry. For example, in 2018 the PRC government issued a series of new national standards, including the New National Standards and General Specifications for Electric Motorcycles and Mopeds, to formally and clearly establish the industry and product standards for electric two-wheeled vehicles, which significantly improved the standardization and safety level of electric-two wheeled vehicles. In the short term, such new national standards are expected to stimulate the replacement demand from consumers who owned unqualified old electronic two-wheeled vehicles. Currently, the implementation of the new national standards is still ununified across many regions, and there remains unsatisfied replacement demand in some regions. In the mid- to long-term, the new national standards will promote the transformation and upgrade of the electric two-wheeled vehicle industry in mainland China with the introduction of new electric two-wheeled vehicles with better performance, better design and more safety functions, which will attract more potential consumers, especially younger generation consumers.

Continuous urbanization process and expanding urban area: Urban population has been increasing rapidly and urban area has been expanding quickly nationwide, indicating an increasing demand for last-mile mobility from urban residents. People will likely turn to transportation tools with effective and convenient mobility, such as electric two-wheeled vehicle. The increasing urban population as well as upgrading consumption structure both provide a larger potential consumer base while the expanding urban area creates more actual consumer demand for electric two-wheeled vehicles.

INDUSTRY OVERVIEW

Rapid development of on-demand delivery market: Urbanization process and increasing household income drive the prosperity of urban retailing and online catering and shopping, which generate enormous demand for on-demand last-mile delivery, where electric two-wheeled vehicles are the most widely used transportation tools due to efficiency and flexibility. Going forward, along with the continuous growth of e-commerce and online catering and shopping industry, market demand for on-demand delivery will have strong growth momentum and stimulate the demand for electric two-wheeled vehicles.

Developing shared mobility market: Shared economy has penetrated into many sub-sectors of the mobility market, including shared bikes and shared electric two-wheeled vehicles. Many New Tier 1 cities and Tier 2 cities, such as Changsha, Kunming and Ningbo, have issued favorable policies to encourage the deployment of shared electric two-wheeled vehicles. Leading shared mobility companies are also increasing their operation scales across mainland China. Positive factors from both regulatory and market participants sides will drive the continuous growth and upgrade of the electric two-wheeled vehicle market in mainland China. According to Frost & Sullivan, the market size of electric two-wheeled vehicle shared mobility in mainland China increased from RMB2.1 billion in 2018 to RMB17.2 billion in 2022, representing a CAGR of 69.2%, and is expected to further increase from RMB20.7 billion in 2023 to RMB30.2 billion in 2027, albeit with a contrastingly lower CAGR of 9.9%.

Development of new technologies: New technologies, especially AI and connectivity, have realized great progress in recent years and also have been applied in multiple industries. Among which, electric two-wheeled vehicle market is one of the important industries which can be combined with AI and connectivity and realize new functions or features such as real-time location, navigation, smart battery management systems and security functions to increase product performance, improve user experience, create new market opportunities and also promote the upgrade and transformation of this industry.

Continuous development of battery swapping and improvement of charging infrastructure: Battery swapping or battery-as-a-service allows electric two-wheeled vehicle owners to conveniently replace the discharged batteries with charged ones at swap stations, which is more efficient and time-saving as compared to charging and allows longer traveling distance. The implementation of new national standards in mainland China has also promoted the application of lithium-ion battery, which laid the foundation for the development of battery swapping business. Meanwhile, users, especially those in on-demand delivery industry who have strict requirement for stronger batteries, are strongly motivated to use such service to improve delivery efficiency. From 2018 to 2022, the market size of electric two-wheeled vehicle battery swapping service in mainland China grew rapidly from RMB0.1 billion to RMB4.2 billion. With the continuous standardization of electric two-wheeled vehicles, wider adoption of lithium-ion battery and expanding scale of battery swapping stations driven by governmental and private sector investments and favorable policies, this market is expected to create further incentive for consumers to widely use electric two-wheeled vehicles and experience rapid growth in the future, reaching RMB35.2 billion in 2027, representing a CAGR of 40.6% since 2023.

INDUSTRY OVERVIEW

Development of regulations and supervisions and analysis of legal risks: The electric two-wheeled vehicle industry experience a boost by the early development of shared economy and shared mobility from 2016 to early 2017 when dozens of shared mobility companies emerged due to the lack of regulations and supervision followed by a stage of strict regulations and supervisions from April 2017 to April 2019, during which certain major cities forced major shared mobility players to cease operation and electric two-wheeled vehicle shared mobility was not supported. Since April 2019, the implementation of New National Standards and other national standards significantly promoted the standardization level and safety performance of products, and will also promote the healthy development of this industry. It is estimated that, for complying manufacturers, common legal risks in the industry such as being involved in fire or traffic accidents will gradually decrease in the post-New National Standards era. Set forth below are certain aspects of the new national standards that contribute such decrease:

- *Overall performance improvement.* The new national standards have raised the upper limits in many aspects including speed, weight and motor capacity, which better satisfy demands of consumers, reducing their need to alter the vehicles and making it less likely for traffic control departments and courts to view electric bicycles as motor vehicles and find manufacturers liable for non-conformity;
- *Mandatory anti-alteration designs.* Article 7.2.1.3 puts forward various requirements for hardware and software anti-alteration requirements reducing the possibility of consumers and distributors altering the vehicle;
- *Clear classification of electric bicycles, electric mopeds and electric motorcycles.* Clearer classification of different vehicle types makes it harder for traffic control departments and courts to view electric bicycles as motor vehicles and find manufacturers liable for non-conformity;
- *Stricter registration (for non-motor vehicles) and license plate (for motor vehicles) requirements.* Registration record or license plate serves as proof that the vehicle conforms with the national standards at the time of sale and therefore is strong evidence of product conformity in relevant legal proceedings; and
- *Enhanced requirements for ex-factory certificate.* Since April 2019, it became mandatory for electric bicycles to obtain CCC certificates before entering the market. In addition, since April 2020, before a new electric bicycle, moped or motorcycle vehicle model enters the market, the manufacturer must deliver the vehicle to a designated testing agency for its inspection and issuance of an inspection report before obtaining CCC certificate from the China Quality Certification Center. As compared with old national standards which only required an ex-factory quality certificate and no mandatory inspection report in many regions, enhanced requirements for ex-factory certificates (a) help mitigate risks of product quality issues before a vehicle enters the market and (b) serve as proof of product quality and conformity in relevant legal proceedings.

INDUSTRY OVERVIEW

Impacts of the COVID-19 pandemic on the electric two-wheeled vehicle market: The COVID-19 pandemic had impacts on the electric two-wheeled vehicle market in different ways. On demand side, the COVID-19 impact is not entirely negative on the electric two-wheeled vehicle market as it benefits certain segments such as online food service and on-demand delivery, of which the demand for electric two-wheeled vehicles grew significantly due to its convenience in last-mile express and on-demand small goods delivery. On personal mobility side, people also embraced electric two-wheeled vehicles on a growing scale to avoid infection risks of public transport. Nevertheless, on supply side, large-scale lockdown may have adverse impact on the production of electric two-wheeled vehicles due to the shut-down of manufacturing facilities or supply chain’s operation.

Starting from December 2022, most of the travel restrictions and quarantine requirements in China were lifted. As the economy recovers from the COVID-19 pandemic, China’s electric two-wheeled market is expected to maintain its strong growth momentum driven by the recovering consumption demand and restored supply chain.

COMPETITIVE LANDSCAPE

Competitive Landscape of Electric Two-wheeled Vehicle Market in Mainland China

The electric two-wheeled vehicle market in mainland China is highly concentrated. While at its peak, mainland China had around 2,000 electric two-wheeled vehicle manufacturers, the number fell to only around 100 as of 2022 that could meet the requirements of the New National Standards and are qualified to manufacture electric motorcycles and electric mopeds. As of December 31, 2022, the top nine manufacturers have taken up approximately 80.8% of the market share. The Group ranked fifth in terms of total revenue in 2022, accounting for 4.2% of the market share of the electric two-wheeled vehicle market in mainland China.

Ranking	Company	Introduction	Total Revenue (RMB Billion)	Market share (%)
1	Yadea	Founded in 2001, Yadea is a Hong Kong listed, Jiangsu based electric two-wheeled vehicle manufacturer, products include electric motorcycles, electric mopeds, electric bicycles and electric kick scooters	31.1	26.9%
2	Aima	Founded in 1999, Aima is an SSE listed, Tianjin based electric two-wheeled vehicle manufacturer	20.8	18.0%
3	A	Founded in 2004, Company A is a Shenzhen based electric two-wheeled vehicle manufacturer	17.0	14.7%
4	SUNRA	Founded in 1999, SUNRA is an SSE listed, Jiangsu based electric two-wheeled vehicle manufacturer	4.9	4.2%
5	The Group	Founded in 2003, The Group is a Zhejiang based electric two-wheeled vehicle manufacturer	4.8	4.2%
6	B	Founded in 2004, Company B is a Jiangsu based electric two-wheeled vehicle manufacturer	4.6	4.0%
7	C	Founded in 2012, Company C is a Jiangsu based electric two-wheeled vehicle manufacturer	3.5	3.0%
8	D	Founded in 2003, Company D is a Zhejiang based electric two-wheeled vehicle manufacturer	3.4	2.9%
9	NIU Technologies	Founded in 2014, NIU Technologies is a NASDAQ listed electric two-wheeled vehicle manufacturer	3.1	2.7%
		Others	22.2	19.2%
		Total	115.4	100.0%

INDUSTRY OVERVIEW

Note: The identity of peer company is presented in code name as the revenue of the private company used in the above ranking is non-public information, which was estimated based on Frost & Sullivan’s primary interviews and calculations. As we have not acquired consent from the company, unauthorized disclosure may cause potential disputes.

Source: Frost & Sullivan

As most small sized regional electric two-wheeled vehicle manufacturers in China, which are less competitive, have been eliminated due to the implementation of the New National Standard since 2019, more established manufacturers who usually have stronger R&D and manufacturing capabilities are driving the upgrade of electric two-wheeled vehicle industry in China, by actively promoting the application of advanced new technologies such as lithium-ion battery, AI and connectivity. Currently, there are around 100 electric two-wheeled vehicle manufacturers in China, and the top nine manufacturers are clearly positioned as medium-to-high end brand and their product price are higher than industry average.

Market Overview and Competitive Landscape of Electric Two-Wheeled Vehicle Markets in ASEAN, India, Europe and the U.S.

With a good two-wheeled vehicle mobility culture, ASEAN countries are encouraging consumers to trade in motorcycles for electric two-wheeled vehicles to address environmental problems. Thailand and Vietnam have both issued restrictions on motorcycles and favorable policies for electric two-wheeled vehicles. E-commerce and online food service industries have also experienced substantial development during the past several years. Total sales volume of electric two-wheeled in ASEAN countries reached 6.9 million units in 2022, representing a CAGR of 26.4% from 2018, and is projected to reach 11.2 million units in 2027, representing a CAGR of 9.9% from 2023.

To realize carbon emission target and avoid risk of fossil energy shortage, the Indian government has issued a series of favorable policies to encourage electric vehicles and has even announced to make India a 100% electric-vehicle nation by 2030, including a proposal that two-wheeled vehicles below the engine capacity of 150cc sold in the country after March 31, 2025 should be electric. Additionally, the improvement of power facilities has alleviated the problem of charging of electric two-wheeled vehicles. In 2027, it is expected that the total sales volume of electric two-wheeled vehicle in India will reach 6.5 million units, representing a CAGR of 46.8% from 2023.

In Europe, the electric two-wheeled vehicle market is currently dominated by Electrically Power Assisted Cycles (“EPAC Bicycles”) followed by electric motorcycles. Promoted by bicycle culture, upgrading emission standards and people’s high awareness of environmental protection, the total sales volume of electric two-wheeled vehicles in Europe reached 7.9 million units in 2022, representing a CAGR of 29.8% from 2018, and is projected to reach 19.9 million units in 2027, representing a CAGR of 19.4% from 2023.

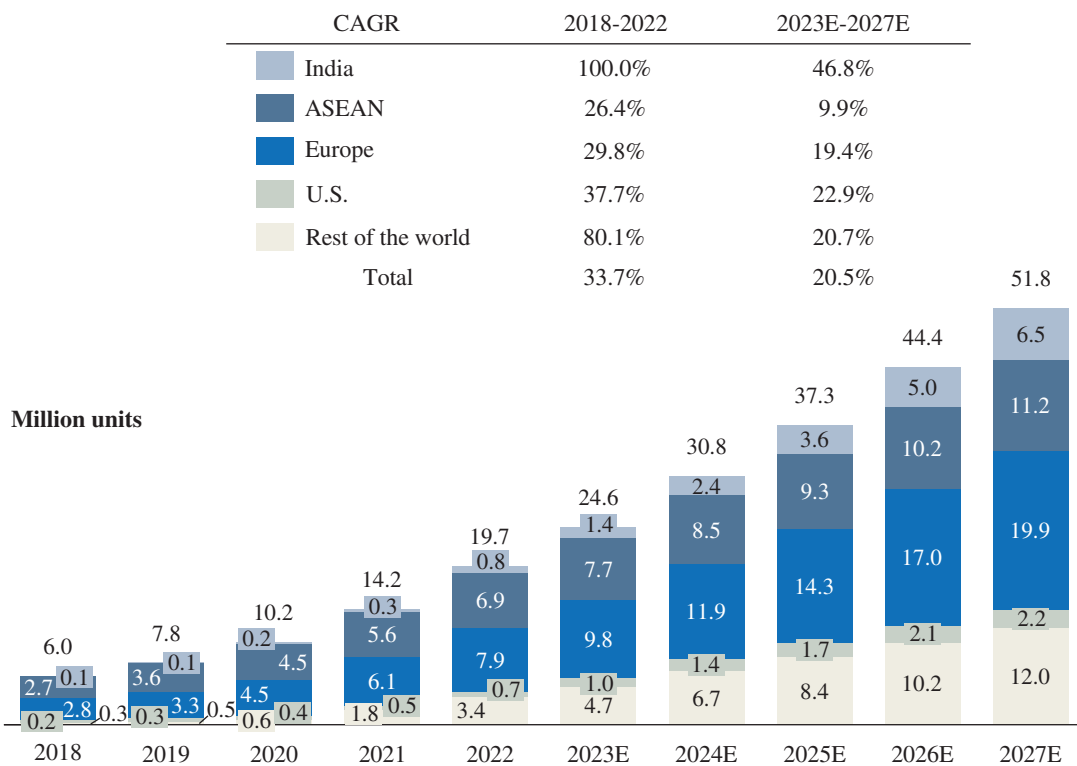
INDUSTRY OVERVIEW

Similar to Europe, EPAC bicycle and electric motorcycles are also dominating the U.S. market. The market size of electric two-wheeled vehicle in the U.S. reached 0.7 million units in 2022, representing a CAGR of 37.7% from 2018, and is expected to reach 2.2 million units in 2027, representing a CAGR of 22.9% from 2023.

In general, competition in the electric two-wheeled vehicle markets in ASEAN, India, Europe and the U.S., are all very fragmented with numerous small manufacturers and no outstanding leading brand at the current stage. In recent years, leveraging strong production and product development capabilities many leading PRC brands are actively increasing presence in these overseas regions.

The following diagram illustrates the overseas market size of electric two-wheeled vehicles by region.

**Electric Two-wheeled Vehicle Sales Volume, Breakdown by Region
(excl. Mainland China), 2018-2027E**



Source: Society of Manufacturers of Electric Vehicles, National Bicycle Dealers Association, Confederation of the European Bicycle Industry, The European Association of Motorcycle Manufacturers, Frost & Sullivan

INDUSTRY OVERVIEW

ENTRY BARRIERS AND KEY SUCCESS FACTORS

Strict regulation and higher compulsory technical requirement: The newly implemented national standards has significantly raised technical requirements for electric two-wheeled vehicles, including fireproof, flame resistance performance and charger protection, and has also set strict requirements on speed, curb weight, power and battery, etc. Such new standards largely increased the industry barriers for technology, manufacturing and quality control. Small and medium manufacturers with limited resources and capabilities to satisfy such requirements are expected to be eliminated gradually.

Development and application of new technology: Technology plays an important role in the increasingly fierce competition of the electric two-wheeled vehicle industry in mainland China. Players in the industry have to develop extensive technology layouts in various areas such as infotainment, more efficient battery management systems, lithium-ion battery and more advanced electric motors to realize better performance on driving mileage, safety and power saving, and to establish first-mover advantages. Development and application of new technologies require extensive and long-term investment as well as decades of technology accumulation, which sets a high barrier for new entrants and small players.

Early-mover advantage: The electric two-wheeled vehicle market in mainland China started in late 1990s. Early movers that have technological know-how enjoyed the opportunity to deeply engage in the formation of national or industry standards, which helped further strengthen their leading position in technology innovation. Additionally, years of continuous investment in research and development, production facility construction and distribution network expansion had enabled the early movers to accumulate substantial technologies, management and operation experience, large and loyal customer base, and brand recognition and reputation.

Extensive and unremitting capital investment: Construction of production facilities, procurement of production equipment, and repair and maintenance of equipment will incur substantial capital investment as well. Furthermore, manufacturers may have to invest additional capital in smart factory solution containing software, such as cloud computing, and hardware, such as smart sensors, to increase production efficiency. Players who do not have the capabilities to maintain large scale and continuous investment are almost impossible to realize technology advancement and improve production efficiency.

Brand recognition and consumer mindshare: Some consumers do not realize product differences such as performance parameters among different brands, especially in friendly and steady road conditions. Under such circumstances, brand recognition and preference play important roles in consumers’ decisions when purchasing electric two-wheeled vehicles. Famous brands with good reputation obtain higher market visibility and good word-of-mouth effect, which translates into revenue generated from existing customers and word-of-mouth referral for new customers.

INDUSTRY OVERVIEW

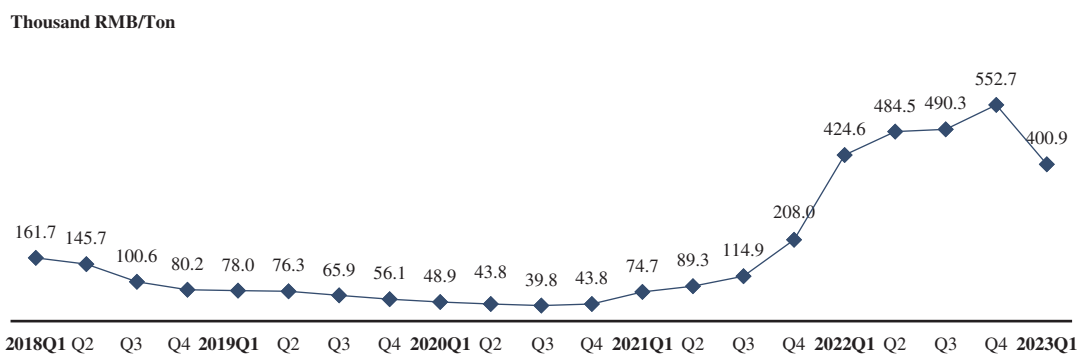
Wide coverage of distribution networks: As electric two-wheeled vehicles are widely used in lower tier cities and rural areas, widespread distribution networks are necessary to approach customers in such areas. Establishing and maintaining large and effective distribution networks require tremendous investment of time and resources, and mutual trust relationship between manufacturers and distributors. New market entrants may face difficulties in maintaining continuous and significant investments in building and maintaining distribution networks.

PRICE TREND OF KEY RAW MATERIALS

Price Trend of Li₂CO₃ (Battery Grade), Lead and Primary Aluminum (A00 Grade), 2017-2021

Battery grade Li₂CO₃ is the key raw material of producing lithium-ion batteries for electric two-wheeled vehicles, accounted for approximately 30% of the cost of lithium-ion battery cell. From the first quarter of 2018 to the third quarter of 2021, the quarterly average price of battery grade Li₂CO₃ ranged from RMB40 thousand per ton to RMB170 thousand per ton. Starting from the third quarter of 2021, the price of battery grade Li₂CO₃ experienced a significant increase and reached an average of RMB552.7 thousand per ton in the fourth quarter of 2022, which can be primarily due to the shortage of lithium supply and booming demand of lithium from both NEV and power storage sectors. Li₂CO₃ prices are currently returning to normal at a rapid pace, averaging RMB400.1 thousand per ton in the first quarter of 2023 and RMB245.0 thousand per ton on 31 March 2023. It is expected that Li₂CO₃ prices will remain at around RMB200 thousand to RMB300 thousand per ton during the forecast period.

Quarterly Average Price of Li₂CO₃ (Battery Grade), 1Q2018 to 2Q2023

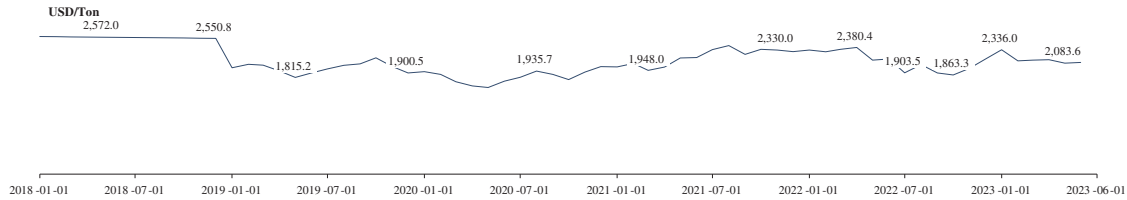


Source: China Non-Ferrous Metals Fabrication Industry Association, Frost & Sullivan

Lead is the key raw material of lead-acid batteries for electric two-wheeled vehicles, accounted for approximately 40% of lead-acid battery cell’s cost. During the past 5 years, price of lead fluctuated but generally remain stable at USD1,800 per ton to USD2,600 per ton. As a key bulk raw material, lead is applied to various downstream industry verticals and the supply chain is stable. Therefore, it is expected that the price trend of lead in the future will be stable.

INDUSTRY OVERVIEW

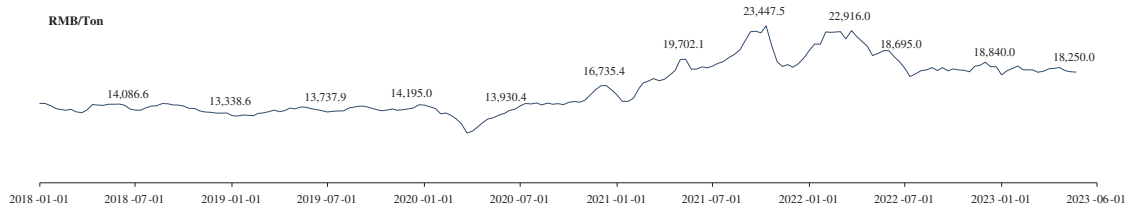
Monthly Average Price of Lead, Jan. 2018 to May 2023



Source: Trading Economics, World Bank, Frost & Sullivan

Primary aluminum is another key raw material of producing electric two-wheeled vehicles. From early 2018 to mid-2020, the price of primary aluminum was relatively stable. Starting from the second quarter of 2021, the price of primary aluminum increased quickly due to recovering macro economy and the monthly average price reached a high point to RMB23,447.5 per ton in October 2021. In the last two months of 2021, due to excessive aluminum inventory level, the price of primary aluminum experienced a short-term sharp decline, but the price returned to an upward trajectory due to increasing energy price and decreased production capacity of aluminum caused by COVID-19 pandemic. The price of primary aluminium is currently stable at around RMB18,000 per tonne. It is expected that the price of primary aluminium will remain between RMB15,000-20,000 per tonne during the forecast period.

Monthly Average Price of Primary Aluminum (A00 Grade), Jan. 2018 to May 2023



Source: National Bureau of Statistics of China, Frost & Sullivan