

Ong Shu Yi
ESG Analyst
+65 6530 7348
ShuyiOng1@ocbc.com

Asia's Electric Vehicle (EV) Market

1. Key takeaways

This report serves as a primer to the growing EV market in Asia, including the growth trends and potential investment opportunities. The key takeaways are as follows:

- The transport sector in **Asia has high potential for decarbonisation through EV adoption**, where there is high energy demand and countries are rapidly urbanising.
- Key trends in Asia indicate **significant growth** in the EV market over the next decade i.e. **increasing consumer interest and adoption of EVs, strong regulatory push** to develop EV markets, and more **EV manufacturing facilities and R&D centres anchoring in Southeast Asia**.
- Barriers to EV adoption by consumers include **inadequate EV charging infrastructure, slow charging times** and **high upfront capital cost**.
- To support this growing market and address the barriers to adoption, investment opportunities include **developing a more robust and reliable EV charging infrastructure network, strengthening supply chain resilience for critical minerals, and developing innovative technologies**.

2. The transition towards a cleaner transport sector

The transport sector makes up 17% of global greenhouse gas emissions, presenting an opportunity to decarbonise the sector through EV adoption. Apart from enabling countries to meet their climate goals, the electrification of the transport sector can also reduce air pollution and oil import dependency through reduced fuel consumption.

In 2021, EV sales accounted for 9% of the global car market, which was about four times of its market share in 2019. China and Europe contributed to more than 85% of global electric car sales in 2021. The growth of this market can be attributed to supportive government policies and regulations, and increasing investments by leading automotive OEMs.

3. Growth trends in Asian markets

Pivoting the transport sector in Asia to a greener future is an important step to meet the region's climate goals, especially when it faces high energy demand and many emerging economies continue to grow rapidly. It is anticipated that Asia's EV market will show significant growth with the key trends elaborated on in the following paragraphs.

3.1 Increasing consumer interest and uptake of EVs in Asia

Compared to the more mature Asian markets of China and South Korea, the overall EV adoption in emerging markets (ASEAN and India) is lagging behind (Table 1).

Table 1: EV adoption rate in some Asian markets, 2021

	Country	EV adoption rate, %
Mature EV markets	China	16.1
	South Korea	6.5
	Australia	2.9
	Japan	1.2
Emerging EV markets	Thailand	0.7
	Singapore	0.5
	India	0.5
	Malaysia	0.3
	Indonesia	0.1

Source: McKinsey, Bloomberg, OCBC

Mature EV markets are expected to see strong growth in the adoption of electric four-wheelers, with China continuing to be the largest EV market. The uptake of electric two-wheelers in emerging markets is also increasing with the increasing cost-competitiveness of this mode of transport, and incentives to encourage consumer adoption. India and Indonesia are anticipated to become the second and third largest markets for electric two-wheelers globally behind China by 2030.

3.2 Ramp up on EV regulations and initiatives in Asia

There is strong regulatory push to develop the EV markets across Asia, especially in the more mature EV markets. China, Japan and South Korea have established policy frameworks to support EV adoption, including official EV targets, plans for EV charging infrastructure, bans on internal combustion engines (ICE) and subsidies to accelerate consumer adoption.

In other parts of Asia, Singapore has also implemented tax incentives such as the EV Early Adoption Incentive (EEAI) that enables owners of electric cars to receive a rebate of 45% off the Additional Registration Fee (ARF¹), while Thailand has an incentive package including tax breaks and subsidies for imported and locally manufactured EVs that will help reduce the price of each EV by 70,000 – 150,000 baht. Although Malaysia has EV tax incentives for imported EVs, locally assembled EVs and EV owners, it is lagging behind other countries on a clear policy framework such as the timeline for banning ICE vehicles.

¹ The ARF is a tax imposed upon registration of a vehicle in Singapore, calculated based on a percentage of the Open Market Value of the vehicle.

3.3 EV manufacturing and research in Southeast Asia

EVs are largely manufactured at production facilities in China, Europe and America. Increasingly, Southeast Asian countries are setting up local EV supply chains and automotive players are anchoring their EV production facilities in the region. In particular, Indonesia and Thailand are becoming key regional EV production hubs. Indonesia has an abundance of minerals necessary for the production of EVs e.g. nickel, copper and cobalt, allowing automotive players to diversify away from China as the main production hub especially with recent supply chain disruptions from the pandemic. In Mar 2022, Hyundai Motor Group completed its first manufacturing plant in Indonesia with an annual production capacity of up to 250,000 units annually, which is also Southeast Asia's first facility to produce battery EVs.

Singapore has also attracted automotive players to anchor their R&D centres in the country to tap on advanced manufacturing capabilities, such as (i) the Hyundai Motor Group Innovation Centre which includes a small-scale EV manufacturing facility, and (ii) Nio's R&D Centre for artificial intelligence and autonomous driving. These developments are advancing the EV value chain in Southeast Asia, and EV production in emerging markets is forecast to scale rapidly (combined CAGR of ~45%) to a significant market share by 2030.

4. Barriers to EV adoption

To enable widespread EV adoption, several factors that pose as obstacles to EV adoption should be addressed. Issues that consumers face include the following:

1. Inadequate EV charging infrastructure: EV charging points in most countries are presently not as widely available as conventional petrol stations. Therefore, the lack of a widespread charging network is deterring some consumers from making the switch to EVs. Where charging points are available, there is also the issue of charging lot availability that poses as a hurdle to EV adoption.
2. Slow charging times: Most consumers are accustomed to pumping petrol quickly at conventional petrol stations. As it takes a longer duration to fully charge an EV (i.e. at least 30 minutes to reach 80% charged at the fastest charging stations), some consumers are not keen to make the switch to an EV for time efficiency.
3. High upfront capital cost: Despite the roll out of incentives for EV ownership, the large capital outlay of buying an EV poses as a barrier to middle and lower-income households. Hybrid or petrol-fuelled cars remain relatively more affordable at present. As the cost of raw materials (e.g. nickel and lithium) for EVs have increased during the COVID-19 pandemic, some automakers have raised prices on new

vehicles accordingly. EVs are also still more expensive in the second-hand market, discouraging widespread uptake of EVs.

5. Potential investment opportunities

The rapidly growing EV market presents opportunities across the value chain for investors, as countries continue to accelerate the move towards a greener transport sector and address barriers to adoption. Investment opportunities include but are not limited to the following areas:

1. Developing EV charging infrastructure: It is necessary for the EV charging network to keep pace with the rate of EV adoption. Investments are required to build up reliable and widely available charging infrastructure, which can be especially challenging in larger countries with relatively inaccessible remote areas. This may address consumer concerns on inadequate EV charging infrastructure. As EV charging is expected to comprise a significant portion of electricity demand in more mature markets by the next decade, it is important that grid operators ensure the reliability of the grid to handle high electricity demand. In areas with high demand for charging, the electrical grid may need to be upgraded to expand its power capacity that constitutes costly installations and comprehensive planning.
2. Building supply chain resilience for critical minerals: EV manufacturing depends heavily on minerals and rare earth elements, such as lithium, nickel, manganese and graphite that are important to battery performance/life and EV motors. Some countries have supply chain vulnerabilities for minerals and rare earths e.g. India. Investments in domestic production can support a more secure supply of these minerals and reduce the dependence on other countries and supply chain vulnerabilities.
3. Developing innovative technologies: As the EV market grows, there are continuous improvements and innovations in EV battery systems and charging solutions. These include efforts to improve today's batteries to be lighter, more cost-effective, have longer battery life and charge faster. Industry players are developing newer battery technologies such as sodium-ion batteries and solid-state batteries, compared to lithium-ion batteries that dominate the current EV landscape. The development of new technologies usually requires large capital to accelerate R&D and enable the scaling up of solutions. New battery systems that charge faster may be able to address the challenge of slow charging times, that may attract more consumers to make the switch to EVs.

6. Summary

The EV market in Asia is expected to grow rapidly with China being the largest EV market, and other parts of Asia gradually scaling up EV infrastructure and initiatives. On top of growing consumer interest in EVs, governments are signalling their commitment towards decarbonising the transport sector through regulations to move away from ICE and increase EV adoption.

Building a better developed EV ecosystem in Asia, especially in emerging Asian markets, is crucial to accelerate EV adoption and contribute to climate goals. This would require addressing the barriers to adoption through levers such as greater investments in EV charging infrastructure, increased supply chain resilience for critical minerals, and improved EV technologies. Widespread EV adoption would require coordinated efforts from government authorities and industry players, to enable the deployment of solutions towards a low-carbon transport sector.

Treasury Research & Strategy

Macro Research

Selena Ling
Head of Research & Strategy
LingSSSelena@ocbc.com
Tommy Xie Dongming
Head of Greater China Research
XieD@ocbc.com
Wellian Wiranto
Malaysia & Indonesia
WellianWiranto@ocbc.com
Ong Shu Yi
ESG
ShuyiOng1@ocbc.com
Herbert Wong
Hong Kong & Macau
herberhtwong@ocbcwh.com

FX/Rates Strategy

Frances Cheung
Rates Strategist
FrancesCheung@ocbc.com

Credit Research

Andrew Wong
Credit Research Analyst
WongVKAM@ocbc.com
Ezien Hoo
Credit Research Analyst
EzienHoo@ocbc.com
Wong Hong Wei
Credit Research Analyst
WongHongWei@ocbc.com

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