

We plan to focus more on building EV charging hubs at strategic sites: SengTeong Chua, MD, ChargeEV, Malaysia

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SengTeong Chua, managing director, ChargEV, Malaysia spoke to Amit Panday, Senior Research Analyst, S&P Global Mobility, on a wide range of topics, including EV adoption and early consumer trends around EV charging, growth in capacity utilization, on-ground challenges involved in the installation of DC chargers, establishing a cross border charging infrastructure and expansion to potential markets such as Thailand, the Philippines and Indonesia. ChargEV, which is the oldest charge point operator (CPO) in Malaysia, is working to implement innovative technologies such as DC grid and load balancing to solve the local energy distribution problem. The following is an edited transcript of the exclusive conversation.



Source: ChargEV, Malaysia

S&P Global Mobility: Please tell us about ChargEV. What does the EV charger footprint look like and what countries do you operate in?

SengTeong Chua: ChargEV was initially launched by the government under the Malaysian Green Technology and Climate Change Corporation (MGTC) in 2015 to develop a comprehensive charging infrastructure for Malaysia's EV ecosystem, making it the oldest charge point operator (CPO) in the country. Yinson GreenTech acquired ChargEV in 2022 as part of its diversification strategy to place big bets on the electrification megatrend. I joined ChargEV around that time.

Within such a short span of time, I am witnessing the trend of electric mobility catching up very fast. ESG goals are becoming increasingly important not just for companies but also for countries. One of the key ideas behind the take over of ChargEV was to remain at the forefront of building EV charging infrastructure, maintain the leadership and provide a reliable network across the country. Since then, we have been growing our network, including the Borneo part of Malaysia.

As of the first half of 2024, there are around 2,600 public EV charging stations across 920 locations in Malaysia. The growth of EV charging stations is largely driven by the Malaysian government's National Automotive Policy (NAP) and its broader sustainability goals, which are designed to reduce carbon emissions by promoting EV adoption. The government of Malaysia aims to reach 10,000 public EV charging stations by 2025. However, this target may be revised.

ChargEV is a market leader in Malaysia, we are operating close to 500 EV charging stations across the peninsula. Other notable local players in Malaysia include Gentari and JomCharge. We signed up for a roaming partnership. But more than that, we realized early on that working together for mass adoption of EVs is more beneficial than competing with each other. We also came together to represent the charging ecosystem to the government.

We also have a charging network in Singapore. While the ChargEV footprint in Singapore expanded organically, we have since established significant partnerships to supercharge our footprint to support the rapid EV growth rate in Singapore. These include a joint venture with LHN Group to provide AC charging services across 70 car parks in key urban and commercial areas and a roaming agreement with CDG-Engie to create the largest cross-border EV charging network in the market.

In terms of business, we select CPOs with F&B locations, hotels, parks and shopping malls as ideal locations for installation of EV charging points. We have COCO (company-owned, company-operated) and POCO (partner-owned, company-operated) models. We, along with our partners, work on a joint capex plan, we also share revenues. We work with premise owners to install and operate

end-to-end user experience at charging stations. This includes both public charging stations and private charging stations for corporate clients. Premise owners can work with ChargeEV to install EV chargers with zero CAPEX, either outright purchase or leasing, depending on their needs.

Our ChargeEV app provides a seamless and secure way for EV owners to pay for and manage their charging sessions. ChargeEV also has roaming agreements with other CPOs, which allow our app users to use other public charging stations within Malaysia and Singapore.

Our parent company Yinson GreenTech also offers EV leasing services. So, we bundle many services for our customers. Together all these offerings position us in B2C as well as in the B2B segments.

It looks like the idea of destination charging is quite popular in Malaysia. How do you map the ideal location or site for installing EV chargers?

We can call it destination charging or we may call it as suitable stopover sites where people may like to park and charge their EVs. More than destination, I would say choosing a site is more about convenience and where the customers are. We have a data science arm, where we collate all the data into catchments, which helps us understand the demand. We also understand where are charge utilization is. That said, we also look at other macroeconomic factors such as customers' ability to spend etc. What we also look at are the converging points of multiple highways, roads. All these factors come into play while taking a decision on a suitable site.

We also look at a few key brands we work with. For example, Starbucks. We partnered with them and came up with some product bundling, such as discounts on their drinks. This works for both the companies because we bring traffic to them.



ChargeEV charging stations at Aeon Mall in Shah Alam, Malaysia. Source: ChargeEV, Malaysia

In your EV charging network, the chargers draw power from the grid or renewable energy?

Mostly all chargers in our network are dependent on the grid. We are deploying some chargers backed by battery energy storage systems or BESS. That is more to complement the grid. We are totaling about 2.5 MW that we are still deploying. We have been looking at solar panels with AC power, but the DC chargers are not feasible right now. In Malaysia, we get about 3.5 to 4 hours of peak solar energy. So, we found that installing solar panels are not very productive.

We are relooking at locations where we can set up microgrids. We are still studying technologies such as load balancing, energy storage solutions (ESS), among others.

Can you share the split between AC and DC chargers in your EV charging network?

Most of our chargers are AC chargers. However, we are beginning to upgrade our network. Last year, we installed 200 EV chargers and about 80% of them were DC chargers. For new sites, I think DC chargers are the way to go.

Typically, installation of DC chargers is dependent upon a supportive power grid. If the grid cannot support, additional installation of sub-stations or transformers are required, which makes the process far more expensive as well as dependent on government permits. That said, after so much of capex, it becomes difficult to break even within short durations. While installing DC chargers in Malaysia, are you facing these challenges?

This is a common problem everywhere, irrespective of the country. While there is enough power in the main lines, the power grid connecting smaller sites do not offer the required power (for installation of DC chargers). That is a deterrent from speed charging perspective. There also are locations where the grid offers a little more power. We closely monitor these locations with respect to EV density. Based on these factors, we decide whether it would be viable to invest in an ESS to boost the charging output or not. Then we believe, the ESS set up must be movable. In Malaysia, sometimes it could take months or even more to get a sub-station up. Once that it done at the required site where we are using a movable ESS set up for the DC chargers, we can move the latter to other location where it is viable. This is a conscious approach that we take.

The other part where we have invested is load balancing. Together with a German partner, we are looking to set up a DC grid within a pocket to ensure load balancing within a specific area. To be precise, we are looking at achieving load balancing in up to 6 km. So, I think this could be an innovative approach to solving the energy distribution problem, which I don't think is going to change in the next 2-3 years. This approach can future proof my service offerings across multiple sites.

What is the average capacity utilization for chargeEV's charging stations?

That depends on one site to the other, AC and DC chargers, peak traffic time, among other factors. At a DC charger, on an average, we see 2.5 to 3 hours or more per day. I'll give you an example, one site we have (in Malaysia) where we were doing only 1.2-1.3 hours per day in January 2024. But by November, that site was running was 12-13 hours per day.

ChargeEV regularly analyses the utilization data of our chargers to consider whether locations need to be upgraded with more charging stations or other charging options (AC/DC). We also look at how charging utilization changes over time — for example, at Parc Hub in Subang Jaya in Malaysia, the utilization for DC chargers spiked from just 1.25 hours to 13 hours daily. This suggests that more high-powered charging stations are urgently needed in such locations or their vicinity to meet the growing user demand.

Where do you source EV chargers from?

We have tried a lot of brands, but we have realized that every brand has its own personality. Being the oldest CPO in Malaysia, we have dealt with a lot of EVSE suppliers. But over time we have reduced to very few names that offer reliable service support. These include Kempower and Autel. We are gradually moving to the satellite system. So, our focus on R&D is not so much on developing chargers but on integration of these chargers into the grid and other solutions.

How do you assess the EV adoption in Malaysia and Singapore? Can you please share some early EV charging trends? What experience do consumers expect, and what are the key learning points for you so far?

On EV adoption, we started with early models like the Nissan Leaf, and we had only AC chargers to serve those cars. In Malaysia, we have highly subsidized fuel. But the government is now encouraging the transition to EVs. Suddenly we have an influx of Chinese car brands coming into Malaysia and Singapore region, and they are nice cars with very nice price points. Naturally, on top of that, we have tax incentives (for EVs). That's when the consumer begins to shift (to EVs). While doing that the consumer focuses on driving range, charging speed and convenience. Then we saw OCPP (Open Charge Point Protocol) coming out with a mobile-app based communication, taking away the previous RFID card-based practices. That was a positive development.

Furthermore, I believe consumers looking to buy EVs don't have range anxiety, but they are anxious about the waiting time at the charging station. In Malaysia, we have EV chargers installed from Singapore-border all the way to the Thailand border. So, if one plans a trip in an EV, it is easily possible to drive through the country in an EV. If someone drives in to a 100-kW EV charging station to charge his EV for 30 mins, it becomes an hour-long wait time for the second EV driver in the queue. I think people essentially don't know how long they will need to wait before their EV charging process will be completed.

This is also the reason why after having a nation-wide network, we are looking to tweak our strategy to focus more on lesser locations and building EV charging hubs at strategic sites. These charging hubs can come up at sites that have more power and can house more charging guns. This is more convenient for EV drivers as they know these hubs can fast charge EVs and charging bays will be available.

That was one of our learnings. Then just like partnering Starbucks, we are partnering more such retail chains to provide charging services.

We are also looking at establishing cross border networks. As a leading CPO, ChargeEV has leveraged strategic partnerships with Malaysian and Singaporean partners alike. For Malaysia, our strategic partnerships include working with businesses within Yinson GreenTech to support charging needs for rydeEV's electric two- and three-wheelers (E2Ws and E3Ws) and supporting drivEV's corporate fleet clients in providing suitable private charging infrastructure.

We have also entered into roaming agreements with Gentari and JomCharge for users within Malaysia to allow them to use one app across our collective charging station network.

Meanwhile, for Singapore, we cater to the needs of cross-border EV drivers who commute for both business and leisure with over 1,000 charging stations that can be accessed with the ChargeEV app.



ChargeEV charging stations at Eco Galleria in Johor Bahru city in Malaysia. Source: ChargeEV, Malaysia

How do you view the battery swap model?

I believe a battery swap model can work in countries where the CPO operating a battery swap station can sell energy back to the grid. For example, in Europe, this can be done. But in Malaysia, we cannot sell the energy back to the grid. The government does not allow vehicle-to-grid (V2G) unless its their own batteries. Unlike Europe, we cannot do energy arbitrage. This makes battery swap not feasible in Malaysia.

But isn't vehicle-to-grid a general direction for almost every country, given millions of EVs on the roads will bring enormous load on the power grid?

It is a general norm the world over that regulations lag technology advancements. For most governments, the urgency of preparing for the power availability to support millions of EVs has not set in yet. In addition to that, in Malaysia, we are beginning to see a lot of data centers coming in. Each data center consumes an average of 30-35 MW of power. So, the government is beginning to acknowledge that we need to generate more power and it can be done via solar energy or other means. This is where we come in. We are trying to engage with the government, discussing innovative technologies like the utility of installing DC grids. Although there is acknowledgement from the government, these discussions may take a while before they are implemented.

At ChargeEV, we are heading a technical committee for EV charging standards (in Malaysia). We recently standardized CCS2 as the way to go. Now all investments and focus can go towards CCS2 norm and it is also compatible with all EVs. Now we are looking to suggest the utility of ESS systems at charging sites. This is a step-by-step process.

What are the midterm expansion plans for ChargeEV?

First things first, at home, we are upgrading some of the basic chargers. Then we are moving

towards establishing better connectivity. We are looking at setting up some charging hubs on the north-south highway.

Overall, we have a four-pronged approach to our growth plan, which aims to build on our extensive experience in enabling the adoption of EVs:

a) Horizontal: Geographical expansion in Malaysia by targeted business development strategies that cater to the different needs of premise owners:

- i) Residential: Landed enclaves and high-rise apartment buildings
- ii) En-route: Hubs, R&R stations on highways (with a Joint Venture with PLUS Expressways, the largest highway concessionaries or build–operate–transfer operator company in Malaysia)
- iii) Destinations: Offices, malls, hotels and clubs

b) Vertical: Integration across the EV charging value chain via:

- i) Innovations in integrating sophisticated technologies to improve efficiency and user experiences through partnerships such as eLoaded
- ii) Authorized distributor and installer for EV charger manufacturer Autel
- iii) Achieving synergies with Kineta

c) Regional: Opportunity-based expansion across Southeast Asia. For example, besides Singapore, ChargeEV has kickstarted its expansion plan into Cambodia with a charger installation at BYD City Mall. Also, if you see markets such as Thailand, the Philippines, Indonesia are huge. We are evaluating our presence in these markets, but we don't plan to rush.

d) Beyond Land Transport: By leveraging our own Yinson ecosystem, we plan to provide charging infrastructure for marine vessels. Under this head, we are working with marinEV, a business of Yinson GreenTech, to develop marine charging infrastructure in Singapore to support electric vessels in Singapore's port waters. Other than supporting Yinson GreenTech's Hydroglyder and Hydromover vessels, the Maritime and Port Authority of Singapore has mandated all new harbor craft to become fully electric, be capable of using B100 biofuels, or be compatible with net zero fuels such as hydrogen by 2030 — presenting a significant business opportunity.

We are witnessing a lot of strategic alliances in the US and Europe's EV charging space, where carmakers are aggressively partnering with multiple CPOs to provide the end consumers with a robust charging infrastructure. Are we seeing similar alliances in Malaysia too?

Yes, we work with several car brands and provide customers with charging services. We give charging credits to them, and such arrangements fetch upfront revenues. The engagement levels can involve marketing initiatives and branding. Such partnerships are not just limited to the car brands. We also partner CPOs and it can extend to co-developing innovative solutions and offerings, for example home charging solutions.

ChargeEV has worked closely with brands such as Smart, Neta and BMW to attract more Malaysian drivers to switch to EVs. These collaborations include attractive promotions such as charging credits with the purchase of new vehicles or exclusive membership subscription plans. These allow EV owners to transition their lifestyles seamlessly, including charging on the go.

ChargeEV has also worked with brands such as Mercedes-Benz, BMW and CelcomDigi on co-branded charging stations.

What are the on-ground challenges for CPOs in Malaysia? Do local policies incentivize

the expansion of EV charging infrastructure in Malaysia?

We are excited about EV's potential to contribute to a greener future and the growing demand for reliable and convenient charging infrastructure. While much has already been done, government policies targeting the following key challenges will further fuel the growth of charging networks. However, there are a few challenges including high initial investment and operational costs. The significant upfront costs for installing and maintaining charging stations, including hardware, software and site preparation, can be substantial. That said, ongoing operational costs, such as electricity consumption, network connectivity and maintenance, can also be significant.

The scope of limited profit margins is another challenge. The current pricing model for charging services may not be sufficient to cover operational costs and generate adequate returns on investment.

Meanwhile, competition from other operators and the potential for lower electricity tariffs could further erode profit margins.

In addition, the existing grid infrastructure may need to be fully equipped to handle the increased demand for EV charging, particularly during peak usage hours. To this end, upgrading the grid to accommodate EV charging can be costly and time-consuming.

Then we have regulatory hurdles. Complex regulatory processes, including licensing, permits and safety standards, can delay the deployment of charging stations. Moreover, inconsistent regulations across different states and local authorities can add to the complexity of operations.

Despite these challenges, there are several opportunities for EV charging point operators to thrive in Malaysia. We have a strong government support through policies, incentives and funding that can significantly accelerate the deployment of charging infrastructure. This includes tax breaks, subsidies and simplified regulatory processes can reduce costs and encourage investment.

We also have public-private partnerships wherein private companies can collaborate with the government agencies and utilities to leverage resources and expertise to overcome challenges. These partnerships can facilitate infrastructure sharing, reduce costs and improve efficiency.

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