EVALUESERVE

Significance of Interoperability and EMSPs

in **India's EV Charging Industry**

5 September 2022

EV Market and Charging Ecosystem in India

A Fast-developing Segment

The Indian electric vehicle (EV) market is at a nascent stage, with sales accounting for less than 2% of overall vehicle trade across the country. About 340,000 EVs were registered in India in FY'22. This number is expected to go up significantly over the decade, driven by increasing fuel prices, higher acceptance of EVs, favourable government policies and the launch of several reputed EV products known for their high safety standards across price ranges.

The Indian government has announced its ambitious plans to ensure EV sales penetration of 30% for private cars, 70% for commercial vehicles and 80% for 2- and 3-wheelers by 2030 that will be realised on account of a growing need to decarbonise the transportation sector. However, we believe that the goal might not be realised, especially due to post-pandemic supply chain constraints that will slow down the EV transition.

Our analysis shows that EV penetration among 2- and 3-wheelers is slated to be at 35-40% by 2030 and among the passenger car segment is expected to be at 15% by the same timeline. By the time this number is achieved, Indian roads will have as many as 20 million EVs across segments!
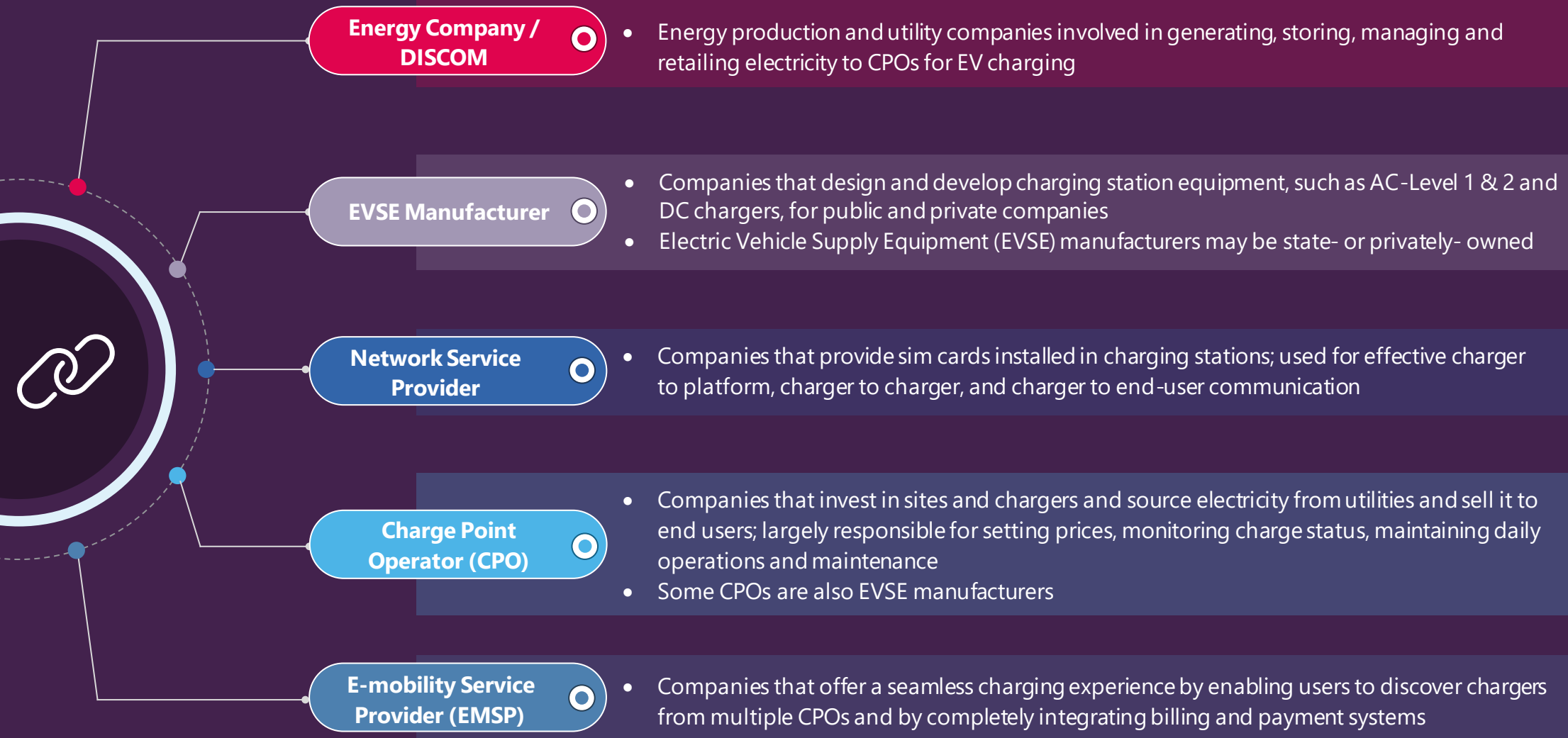
Strategic Planning to Produce Value

India currently has only about 3,500 public charging stations. To cater to high EV volumes, there must be significant investment in developing charging infrastructure across the country. The Indian EV charging market has several government- and private-run charge point operators (CPOs) that function in the semi-public and public charging spaces. However, the utilisation of public charging stations has been at a low of 7%, which is a major challenge for CPOs that have invested heavily in charging equipment and backend platforms.

The gap between consumer expectations and market offerings can be bridged through interoperability / EV roaming services. This convergence will make charging stations operate more effectively to benefit EV users, CPOs, and e-mobility service providers (EMSPs).

Source: Evalueserve Insights, NITI Aayog

EV Charging Value Chain

Energy Company / DISCOM
- Energy production and utility companies involved in generating, storing, managing and retailing electricity to CPOs for EV charging

EVSE Manufacturer
- Companies that design and develop charging station equipment, such as AC-Level 1 & 2 and DC chargers, for public and private companies
- Electric Vehicle Supply Equipment (EVSE) manufacturers may be state- or privately- owned

Network Service Provider
- Companies that provide sim cards installed in charging stations; used for effective charger to platform, charger to charger, and charger to end-user communication

Charge Point Operator (CPO)
- Companies that invest in sites and chargers and source electricity from utilities and sell it to end users; largely responsible for setting prices, monitoring charge status, maintaining daily operations and maintenance
- Some CPOs are also EVSE manufacturers

E-mobility Service Provider (EMSP)
- Companies that offer a seamless charging experience by enabling users to discover chargers from multiple CPOs and by completely integrating billing and payment systems
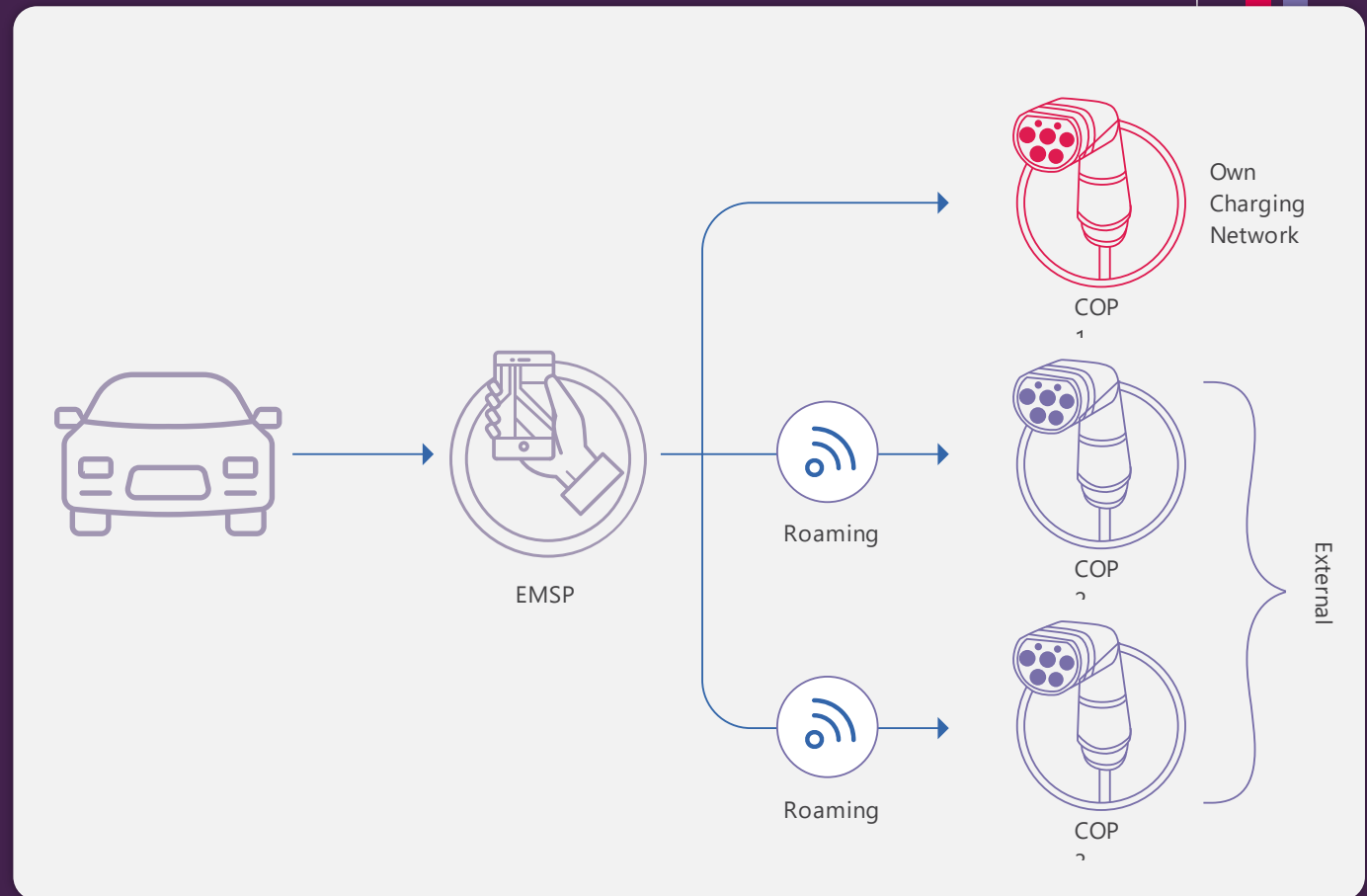
Source: Evalueserve Insights

Interoperability and Benefits of EMSPs

Interoperability is the use of standardised infrastructure that enables market participants to work together seamlessly. Interoperability allows EV drivers to access charging stations operated by different service providers through a single unified platform.

At present, the global market is not fortified through interoperability and EV users need to use multiple mobile apps (8-10) from different service providers to access different charging stations. In developed markets, users avail multiple subscriptions, which make it even more challenging to track consumption.

EMSPs allow EVs, charging stations, charging networks and DISCOMs to communicate effectively and work seamlessly as one system. They enable users to discover, access and charge their vehicles at multiple CPOs using a single app. EMSP also allows the aggregation of charging stations from different CPOs, making public charging more accessible, regardless of travel distance, regional boundaries, or app usage. Apart from providing ease of access to EV users, they boost the utilisation rate of charging stations by 10-15%, enabling CPOs to earn more.

EMSP

Roaming

Roaming

Own Charging Network

COP 1

COP 2

COP 3

External

Source: Evalueserve Insights, NITI Aayog

Interoperability and Benefits of EMSPs

Benefits of EMSP for End-users

- Single touch point to access large networks

- Wide number of CPOs and ability to compare availability and price

- Unified app that pinpoints chargers and allows hassle-free charging and payments

- Free and discounted charging

Benefits of EMSP for CPOs

- Listing on EMSP platforms increases the visibility of chargers

- Higher revenue generation potential due to 10-15% increase in charger utilisation rates

- Faster break-even due to higher monetisation by enabling higher internal rate of return (IRR)

- Reduced operational costs due to value-added services, such as data-driven solutions and API as a service

- Advanced energy management solutions through monitoring, management and adjustment of electricity load at all times
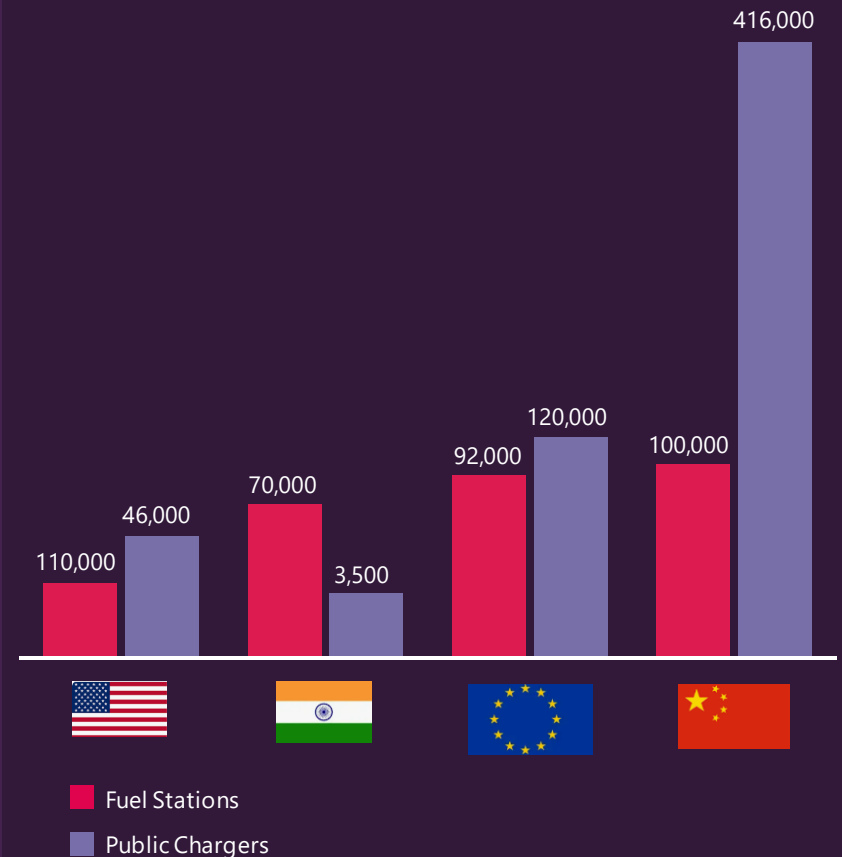
Growing Importance of EMSPs

Conventional petroleum vehicle owners can access any fuel station to fill their vehicles. It is important to give EV users a similar experience when they charge their vehicles at public charging stations. At present, there is a lack of such seamless levels of charging services, as car owners have to download multiple apps and subscribe to different providers to gain access to different charging networks.

Although the total number of charging stations already exceeds petrol stations in regions such as Europe, a majority of these are concentrated in the richest five to six countries. In the US, their number is close to 50% of petrol stations. China has the largest public charging network, with about 1.04 million charging points across the country.

India, on the other hand, is still at an early stage of development, with regard to EV stations. It needs to improve its charging network and reduce the number of EVs per charger to encourage the widespread adoption of EVs.

EV markets are fragmented, even in the developed economies of the US and Europe. The presence of several different CPOs has caused a perceived lack of charging options for EV owners which hinders EV adoption. With range anxiety being the biggest concern, it is necessary for charging stations to work together to create a simplified charging experience by providing access to the full network of chargers.

EMSPs want to tap this opportunity and are partnering with CPOs. They use an open charge point interface (OCPI) to enable roaming between different CPOs. The backend system of E-MSPs use industry-standard protocols to communicate with chargers from multiple service providers and gain the authorization required for the charging process.


Bar chart comparing Fuel Stations and Public Chargers:
- US: Fuel Stations 110,000; Public Chargers 46,000
- India: Fuel Stations 70,000; Public Chargers 3,500
- EU: Fuel Stations 92,000; Public Chargers 120,000
- China: Fuel Stations 100,000; Public Chargers 416,000

Legend:
- Fuel Stations
- Public Chargers

EV Charging Landscape – Developed Countries vs India

Europe currently has around 350,000 EV charging points and major EMSPs such as Last Mile Solutions, which cover close to 275,000 charging points through partnership with multiple CPOs. Europe and the US also have a number of EMSPs, such as Virta Global, Driivz, Current, Go to-U, Panion and Has-to-be, which allow EV users to access a large charging network. In these developed EV markets, the growth of EMSP companies have been slow, as CPOs preferred to operate as standalone units and were unwilling to partner with EMSP or share their revenue. But having seen some advantages, CPOs have begun partnering and integrating with E-MSPs at a large scale.

Vehicle electrification is expected to increase at a rapid pace in India and by the end of this decade will lead to an equally rapid growth rate of charging infrastructure. India's 2W and 3W commercial vehicle segment is expected to be electrified to a large extent soon, as key food delivery service companies such as Zomato and Swiggy have pledged to completely electrify their fleets by 2030. Similarly, the 3W category may also witness rapid electrification due to the significant increase in e-commerce sales; major e-commerce players such as Amazon and Flipkart have made plans to electrify a majority of their fleet before the turn of the decade.

Being an upcoming EV market, it is important that it adopts EMSPs at an early stage, so as to boost access to a growing charging network. There are a number of emerging start-ups in this space in India; a few key companies have been highlighted below.
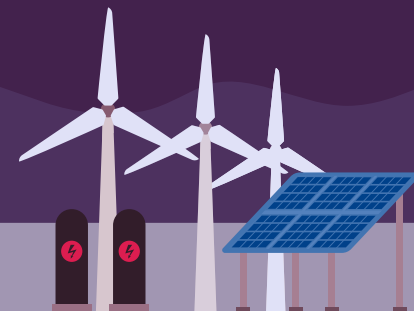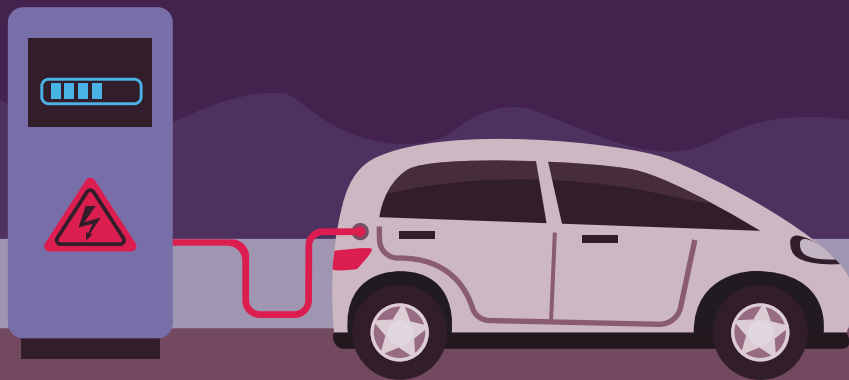
EV Charging Landscape – Developed Countries vs India

ElectricPe

Established: 2021

Funding: USD3 m seed funding, led by Blume Ventures and Micelio Fund

Partnership: Hero has partnered with ElectricPe to bring all its charging stations under the ElectricPe platform; it is also involved in discussions with other OEMs and CPOs

Onboarded chargers: 3,000 public charging points in Bengaluru, along with Hero's charging network

Plan: To onboard 100,000 chargers by 2022 and grow sustainably as partner OEMs and CPOs expand their networks

Numocity Technologies

Established: 2018

Funding: Undisclosed amount from Ideaspring Capital, Rebright Partners and ABB Technology Ventures (ATV)

Funding from ATV led to the acquisition of a 72% stake in ABB, a leading charger manufacturer

Onboarded chargers: Over 1,000 charging points

Plans: To leverage ABB's expertise to build a future-proof platform and onboard more customers and charging points

Electreefi

Established: 2017

Funding: Undisclosed amount, backed by Merck Accelerator Group

Partnerships: Gulf Oil partnered with Electreefi in Mar 2022, to develop solutions and play a key role in the e-mobility space

Gulf Oil will provide infrastructural support, back the startup, and allow direct access to Electreefi in the global market (through Gulf's global reach)

Source: Company Websites

Primary and Alternative Revenues of Indian E-MSPs

The business model of EMSPs is completely reliant on the number of charging stations onboarded on their platform from different CPOs.

The breakdown of EV charging costs is shown on the right. They have to return utility companies' / DISCOMs' costs from the per unit cost charged to end customers.

EV Charging Tariff

DISCOM Tariff

CPOs Margin

E-MSP's Commission from CPOs Margin
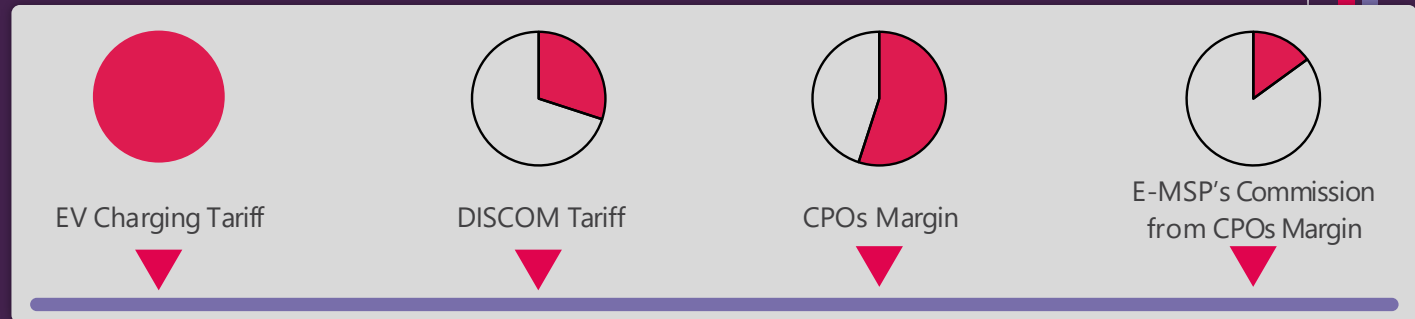
CPOs get a major share of the overall tariff, which they spend as capital for charging stations, installation / maintenance, and cost and operating backend charging management system (CMS). EMSPs get a minimum 10-15% commission from CPOs for each unit of electricity charged through their platform. EMSPs also have other revenue streams that boost their overall revenue potential.

White Labelling
EMSPs can offer CMS with customers' brand and logo

API as a Service
They can provide customizable APIs

Data Monetization
EMSPs can sell utilization and demand data generated by chargers to OEMs, EVSEs and CPOs

Value-added Services
EMSPs can partner with places of interest (POIs), such as malls, brands and shops to offer discounts and packaged solutions to EV owners

Way Forward for Indian EV Market

India is expected to have around 90,000 public chargers installed by 2030. It is extremely important to ensure that consumers have easy access to the entire charging network through EMSPs. In the near future, the following are likely to be some of the key focus areas for sector players.

- Focus on interoperability: Enabling interoperability / roaming through the latest protocols and connecting the growing EV charging network will allow EMSPs to onboard chargers from a wide group of CPOs.

- Standardisation of charging protocols: At present, India follows multiple charging protocols (OCPP, OCPI, OCHP, OICP and e-MIP among others), making it challenging for EMSP platforms to conform to all protocols. OCPI is the most commonly used protocol. Standardising charging protocols will enable EMSPs to integrate chargers and expand their network.

- Elimination of RFID and QR Code for authentication: The next step in EV charging will be the implementation of the ISO 15118 protocol, which is also known as Plug & Charge. It will enable an EV to identify a charging station and authenticate and authorise the charging process without the need for an RFID card or QR code. Implementing this protocol will increase the potential conversion rate of internal combustion engines (ICE) customers to EV customers.

It will be interesting to see which EMSPs will gain an advantage in the Indian market in the near future.

Source: Evalueserve Insights
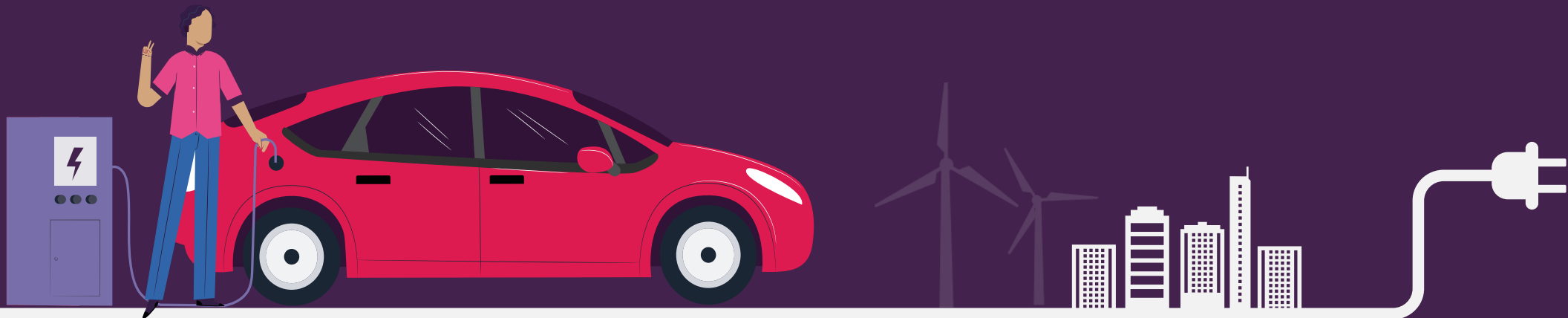
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