Gearing Up for An Electric Vehicle Charge

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Electric vehicles (EVs), as a sustainable solution, are expected to play an integral role in future mobility. Not only do they reduce carbon emissions by up to 50%, they also emit 80% less waste heat and produce far less engine noise. Fuelled by the need to combat climate change and reduce carbon footprint, many countries have set timelines to phase out petrol and diesel vehicles – also known as internal combustion engine (ICE) vehicles – and accelerate the adoption of EVs.

EVs also open up opportunities to introduce the use of renewable energy for the transport sector. They offer significant energy efficiency gains and could emerge as an important energy storage for variable sources of renewable electricity.

As technology advances and more models enter the market, subsidies and incentives are being dished out to encourage the adoption of EVs. This has driven global sales to hit a high of 3.2 million units in 2020, up from 2.26 million units the year before.

Yet before EVs can gain widespread acceptance, some roadblocks have to be cleared first.

Overcoming barriers

The cost of EVs, which is substantially higher than that of most ICE vehicles, poses a significant entry barrier. In the US, an EV costs more than 150% the price of an average ICE vehicle. Another obstacle is the lack of charging points and supporting infrastructure along with limited choice and availability of EV models. These can be stumbling blocks for those looking for greener means of transport.

Fortunately, with the development of fast-charging electric motor technology and sustainable battery manufacturing, the cost of batteries and EVs is expected to fall. Vehicle makers are increasingly launching more EV models to cater to increasing demand. To tackle the issue of limited EV charging infrastructure, more countries are setting EV installation targets and budgets as part of their sustainable transport plans to pave the way for more charging infrastructure.

From the environmental perspective, there is also concern about the long-term impact of depleted EV batteries at the end of their life cycle as they may not be used productively as energy storage devices for most of the time while in idle mode. However, Germany's experiment to reconnect EVs to the power grid is proof that EVs can double up as secondary microgrids to augment overall power grid reliability. Collaboration among companies from the automotive, utilities and related sectors, as well as industry players along the battery value chain, can also create a commercially viable marketplace to reap the full economic benefits of the battery life cycle.

Policies driving EV adoption

To lower the barriers to EV adoption, countries around the world are introducing policies, programmes and incentives, as well as accelerating EV technology development and industry collaborations.

China, for example, has imposed a mandate on car manufacturers that require EVs to make up 40% of sales by 2030. South Korea plans to increase the number of environmentally-friendly cars on the road to 2.83 million by 2025. Besides offering subsidies for EV purchases, there are also plans to set up a battery lease programme to reduce the upfront cost of EVs as electric battery packs are the most expensive component in an EV.

France is offering up to €12,000 (US$14,150) in rebates, while Germany plans to have 1 million charging stations by 2030 with all gas stations offering EV charging in the future. Small and medium-sized companies are also encouraged to renew their fleets through fleet exchange programmes, on top of an increase in funding for electric buses, trucks and charging infrastructure. The US Department of Energy is funding EV projects, including batteries, automotive controls and efficient EV chargers.

In Singapore, the government is rolling out a slew of incentives as part of its plan to phase out ICE vehicles by 2040. It has set aside S$30 million (US$22 million) to accelerate EV-related initiatives in the next five years to encourage more sustainable transportation, and also introduced an EV early adoption incentive to encourage a gradual shift to EV ownership. In addition, Singapore aims to build 60,000 charging points as part of its 2030 Green Plan. It is encouraging the installation of EV chargers for non-landed private residences such as condominiums and private apartments, through a recently announced Electric Vehicle Common Charger Grant.

An electric makeover for commercial vehicle fleets

A sustainable urban mobility network should also incorporate EVs for public transportation such as buses and taxis, and commercial vehicle fleets such as those used for logistics.

More efficient and with lower maintenance needs compared to ICE vehicles, EVs are cheaper to run and maintain, making them a practical alternative with a lower total cost of ownership. Electricity is also cheaper than fuel on average. As the cost of EVs decreases, more businesses and fleet owners will be encouraged to join this green push by incorporating electric commercial vans and refuse trucks into their transport fleets or converting their ICE fleets to more environment-friendly options.

In Singapore, commercial vehicles make up about 15% of the total vehicle population. As a key emission source due to its heavier usage, commercial vehicles form the ideal segment to drive EV adoption. The city-state has introduced the Commercial Vehicle Emissions Scheme (CVES) and the Enhanced Early Turnover Scheme (ETS) to promote the adoption of cleaner, newer Light Goods Vehicles and encourage the early turnover of older, more polluting commercial vehicles.

The country has also committed to having a 100% cleaner energy bus fleet by 2040. In October 2018, Singapore's Land Transport Authority procured 60 electric buses of which 20 electric buses were provided by ST Engineering with pantograph charging infrastructure. When fully deployed, the CO2 tailpipe emissions from the buses will be reduced by about 7,840 tons annually, equivalent to the annual CO2 tailpipe emissions of 1,700 passenger cars.

An all-in-one EV solution

To facilitate the shift to EVs for vehicle and fleet owners, car park operators and building owners, EV solution providers such as ST Engineering offers all-in-one EV solutions.

Its AGIL Electric Vehicle Charging solution comprises a comprehensive EV management platform that supports all charger makes and models. Through the platform, car park operators and fleet owners can monitor the health of their chargers in real time, access an integrated overview of their charging operations and revenue collection status on the charging network, as well as take action to prevent the overloading of the power grid while optimising the efficiency of EV charging and storage.

As the solution is cloud-based, car park operators benefit from saving on the initial capital investment and maintenance costs compared to on-premise equipment. It also enables seamless remote access and monitoring of charging assets and resources in a secure environment. The platform can also be paired with a mobile application, giving car park owners the flexibility to seamlessly integrate EV charging with smart car park features. Operators and fleet owners can also monitor their charging status and pay for charging and parking fees through a common mobile app.

As an end-to-end EV technology solutions provider, ST Engineering recognises the vehicle electrification journey for every organisations is different. Whether it is a car park operator, building owner, commercial fleet owner or public transport operator, ST Engineering's suite of EV solutions addresses concerns over vehicle electrification by offering modular EV solutions that can be adapted and scaled for different operating models to help stakeholders achieve their sustainability and business goals.

Learn more about our comprehensive Electric Vehicle Solutions.