

COMMENTARY

Innovations needed for electric vehicle sector to move ahead

By Yuen Kah Hung

WHEN the Singapore government embarks on Phase 2 of the electric vehicle (EV) test-bed in 2016, we will see more EVs on our roads. Spanning 10 years, Phase 2 will see 1,000 EVs deployed for car-sharing purposes, up from the 89 EVs that were deployed to corporate and government agencies between 2011 and 2013 during Phase 1.

While the initial purchase price of an EV can be two or three times that of a comparable car running on petrol, the cost of recharging an EV (assuming that residential electricity tariffs are paid) is only a quarter that of the cost of refuelling a petrol car for the same distance driven. But if we factor in the high costs of building charging infrastructure – ie, the installation of charging stations throughout the city – the cost of running an EV is high.

Participants in Phase 1 of the EV test-bed paid a contracted fee of S\$180 for unlimited charging. This is not much cheaper than the cost of petrol, which worked out to about S\$220 a month for a typical 1.6-litre Japanese sedan driven about 50 kilometres per day (the national average mileage for private cars in Singapore). The EVs in Phase 1 of the test-bed travelled 46 kilometres daily on average.

Scale plays an important role in ensuring that charging costs are reasonable and that charging service businesses can be commercially viable. Setting up the necessary charging infrastructure involves not just installing charging stations, but also creating a back-end system. Data centres need to be developed to monitor charging activities for the purposes of billing and informing drivers of the availability of charging stations. People need to be hired and trained to maintain the network of charging stations. All of these entail a high fixed cost for businesses.

Fast chargers, which can typically top up the battery from zero to 80 per cent in 15 minutes, are more suited to meet the needs of consumers and fleet operators. The short turnaround time enables a fast charger to charge 90 EVs per day. Buying and setting up a fast-charging station costs as much as S\$50,000. Unless there is a critical mass of EVs, the charging service provider would need to set a very high fee for the usage of the fast charger in order to recover the upfront capital cost. This cannot be viable because EVs will be too costly to operate in the first place.

The larger the deployment of EVs, the more charging infrastructure will be needed. Howev-

er, the larger the fleet of EVs, the easier it is for the service provider to recover its investment costs. Thus, the charging cost per EV will fall, making EVs a more attractive option.

Following the downward spiral and low plateauing of the price of oil from a high in June last year, EVs have become less attractive financially. But if driven over a long distance, they might still have a lower total lifetime cost due to the operating cost savings. This is why the future of EVs seems to lie in the high mileage driving characteristic of car-sharing fleets and also commercial fleets. EV car-sharing operators can potentially save on operating costs compared to petrol cars, and a larger EV deployment lowers the charging costs per EV.

Hence, the government has wisely decided to make Phase 2 of Singapore's EV test-bed extend over 10 years. The longer duration will allow companies to recover their initial capital investment. It is also a step in the right direction in terms of enhancing environmental sustainability and encouraging R&D in clean energy technologies.

Singapore recently launched its first electric taxi, EVA. These cars were designed with a longer driving range per charge and for tropical climate conditions. Going forward, the government's focus should be on understanding the EV market and implementing supportive policies. Although the rebate for EVs under the Carbon Emissions-Based Vehicle Scheme (CEVS) will be raised from S\$20,000 to S\$30,000 on July 1, EVs will remain relatively costly. There is a need to experiment with policies to somehow reduce the upfront cost of EVs, and also reduce the uncertainties over their performance.

In the United Kingdom, Renault-Nissan offers battery leasing schemes for its Renault Zoe and Nissan Leaf. This means that a consumer could purchase an EV without its battery and lease it on a monthly basis from the car manufacturer or dealer. Not only does this reduce the upfront cost, it also allays the fear of recurrent costs due to battery degradation because it is the car manufacturer or dealer who is responsible for battery repair or replacement.

Such schemes would likely be popular if offered here. Both technological and policy innovations are necessary for the EV industry to move ahead. No doubt Singaporeans will learn more as the government proceeds with Phase 2 of the EV test-bedding, and also closely watch the results of test-bedding in other countries.

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