



## EV REVOLUTION WILL NOT HAPPEN OVERNIGHT

Our financial secretary has just rolled out a budget with a lot of goodies. Predictably, environmental protection is a key area, especially the promotion of electric vehicles.

The advantages of EVs are well known. They have no roadside pollution and are quiet and reliable compared to petrol- or diesel-powered vehicles.

Hong Kong, compared to other Asian cities, is in the EV forefront, taking second place behind Beijing, with 2.1 percent of total vehicles using electric power. That is no mean feat as it means growth from zero to over 10,000 in a bit more than a decade.

However, I believe pure EVs, like hybrids, are only an interim solution for the following reasons.

The prime limitation on their use is range. A petrol or diesel vehicle can run for 300 to 600 kilometers before refueling is needed, and that only takes minutes.

Until recently, EVs had a range of less than 200km, and those covering 500km are only limited to one make, Tesla.

To power up for this long range, either Superchargers or more than an overnight charging is required, if standard 13-amp home power points are used.

A larger ampere power supply will require special installation, which involves considerable costs.

An EV weighs at least 20 percent more than an equivalent internal combustion vehicle.

In economic terms, EVs cost at least twice as much as their internal combustion equivalents, and therefore require a large subsidy to make it viable.

Added to this is the limited availability of charging points.

Most vehicle owners here do not have fixed parking spaces with a readily available power points adjacent to them.

This is not a problem unique to Hong Kong, but to many cities.

Public car parks have exclusive sections for EVs for charging purposes, and many motorists are already unhappy to find



some car parks full but yet have EV spaces lying empty as the city can never accurately predict actual use by EVs.

It will take a long, long time before EVs can replace internal combustion vehicles.

Battery efficiency will improve and in the next 10 years we could see a lot more EV choices with ranges of over 300km.

The UK has boldly announced that by 2035 it will not allow vehicles with internal combustion engines to be registered.

But 15 years is plenty of time for politicians to modify their plans.

My bet for the long term is on hydrogen power fuel-cell vehicles.

Again, they have no roadside pollution, only releasing water as a by-product.

Hydrogen has a very high power-to-weight capacity and will provide a comparable range based on one tank.

Filling up is almost as quick as petrol or diesel. The only limitation is availability of hydrogen in commercial outlets.

With the rapid increase in use of renewable energy, power available during night-time off-peak hours can be used to produce hydrogen by electrolysis and easily transportable to consumers.

Obviously, we will have to gradually replace petrol/diesel stations with hydrogen supply stations.

Did I hear someone mention safety?

We had the same concern when we rolled out LPG-powered taxis 25 years ago, but I have not heard of undue safety issues with such vehicles. Engineers will devise systems that will ensure public safety, with specially designed equipment and appropriate training of technicians.

I am confident we will see gradually improving air quality in our city with time.

**Veteran engineer Edmund Leung Kwong-ho casts an expert eye over Hong Kong's iconic infrastructure**