**Looking at the electric vehicle**

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May 22, 2019

Prime Minister Imran Khan has asked ministries to prepare a policy towards the introduction and development of electric vehicles in the country. This is a wise and timely step.

Electric vehicles (EVs) are getting increasingly popular by the day. Clean air requirements and GHG mandates have made EVs a reality. EVs have a high purchase cost, but are energy efficient. Due to cheaper electricity than petrol and diesel and higher efficiency, the operating costs of EVs are much less. Thus, the life cycle cost of EVs is lower than conventional fuel vehicles. However, the upfront costs are still high, and thus the need of a policy. In Pakistan, the capacity trap is another good reason to introduce EVs to improve capacity utilization. Night charging of EVs may particularly be useful in this respect.

EVs have a fuel-cost advantage over conventional vehicles by a factor of 2, depending upon the comparative prices of petrol vs electricity. However, the high upfront cost, is a major impediment in EV sales, especially in poor developing countries. It is being projected that by 2025 or slightly later, the price difference will go away. There are varying driving factors in individual countries. In Northern Europe, where there is heavy fuel taxation, EVs may be more attractive than in the US where fuel costs are probably the lowest among advanced countries.

Global market share of EVs stood at 4.6 percent in 2018. By 2025, the market share may go as high as 12.5-25 percent. In China, EV market share of 50 percent is expected by the year 2025 and in Norway, it is already 50 percent. The market share of EV buses in China is already 90 percent. The largest electric bus manufacturer in the world is BYD of China (The CPEC framework could be utilized for launching the system under which technical and financial assistance could be obtained). In Europe, there is a target of 100 percent urban electric buses by 2030 and a market share of EV buses of 75 percent by that year. EVs may become the market leader between 2025 and 2030 in the developed world.

India plans to have a 30 percent market share of EVs by 2030.This year, India has announced a $1.4 billion subsidy programme for EVs. The programme is, however, focused on two and three-wheelers and buses and only marginally on cars. After China, India has made great plans for introducing electric buses; the main driving factor being urban pollution. Several EV production plants have already been built. Of special interest to us may be the Maruti-Suzuki and Mahindra-Mahindra initiative activity in EV production in India. Another important company is the BYD (Chinese) joint venture with a local Indian company manufacturing electric buses.

In India, Mahindra has launched its e2O electric car at a price of PKR1.0 million and an e-Rickshaw at a price of PKR2-3 lakhs (for 3 and 5 seaters respectively). Maruti-Suzuki is to launch its new electrical version of the Wagon-R by the year 2020 at a price of $10,000 with subsidy and 30 percent higher without subsidy. The petrol version today is priced at $7000. Suzuki has a strong presence in Pakistan, and its Indian experience may be replicated here conveniently.

In Pakistan, to contain pollution, EV buses may be an ideal solution for metros and the satellite feeding buses that are required for connecting the metro with different areas. The annual bus demand is of 800 vehicles, catered to by three assemblers. It is unlikely that local production would be justified at this volume. On the other hand, one can foresee some activity towards conversion of existing conventional buses into electric buses. There are 250,000 buses and an equal number of trucks (250,000) operating which may create a much larger demand of conversion. Conversion of diesel buses into electrical bus has become a mainstream activity. Earlier, it was a DIY activity or on a smaller scale. Now big companies have come into this sector and are offering conversion kits. All it requires is to replace the existing diesel engine by an electric motor and fit the battery under chassis. In Pakistan, there is great potential to introduce the conversion business. The EV policy should consider conversion aspects as well.

There are three major companies in cars (Suzuki, Toyota and Honda) and three (Hino, Isuzu, Master) in the buses and trucks market, which may have a major stake and influence on the EV policy. Toyota and Honda do not have a clear vision or market plan yet for the EV sector, even globally or in the region. They have an interest in hybrids which are not really EVs in the real sense. They do have one or two symbolic EV models but have not developed a full range of products. Their limited current offerings in EV do not match with their main products, here in Pakistan and elsewhere. As mentioned earlier, Suzuki has one EV product that has chances of good market share in the absence of Toyota and Corolla in the EV market.

Many small local investors backed by Chinese principals are interested in local assembly of EV cars and have reportedly submitted their proposals in this respect. Reportedly, not much interest has been indicated in electric buses, perhaps due to the smaller market size. Whether it is EV or a conventional car, it is still largely conventional technology and the processes of painting, welding and metal work. Only 30 percent of the cost may be EV specific. There has been a yearning in the country to produce rather than assemble cars. A number of attempts have failed earlier in this respect, and it requires deep pockets, technology and market power.

There are three policy choices; one, to allow free import of EVs at none or reduced custom duties which can flood the market at the expense of the existing local car industry. The second is to promote local manufacturing under custom duty concessions; this will introduce a small and separate EV industry away from the mainstream automotive industry. The risk is that the market may be fragmented by the induction of smaller uncertified and established companies, something that should be avoided.

The third is to induce the existing automotive industry under a deletion programme; to introduce EV; the existing players may be able to introduce limited models not catering to the market spectrum. They may require a longer time framework. New players, such as from China, may be introduced under this. The government may be able to attract big Chinese companies under its SEZ programme of CPEC via this approach. There is another potential market of motorcycles which can also go electric. The motorcycles market is of a respectable size.

The establishment of electrical charging infrastructure is a major policy question. Public transport should receive priority. Conversion of buses (five years or less old) to EV should receive attention. Pick-ups and 4x4s may have better chances to succeed. EVs offer a good opportunity to bring in more and genuine competition in the automotive sector. All this requires an EV policy which should pull together the various strands of the issue through stakeholder consultations. Oil is already gone from the power sector; if it also goes away or is significantly reduced from transport sector, one may have to reconsider or dilute the heavy investments programme in the oil sector that is being considered by the government.

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