The Projected Future of Electric Vehicles

A rash of articles and reports on the future of electric vehicles have appeared in the business press during the summer of 2017.

From these we have learned that Volvo, now a Chinese-owned company, will transition towards ‘some form of electric propulsion’ by 2019. And, surprisingly, even Elon Musk’s Tesla 3 may also be produced in a factory in Shanghai so as to avoid China’s 25% import duty.

We learned that China which, by 2016, had become the world’s largest producer of electric vehicles is, reportedly, poised to further significantly increase its capacity for producing advanced batteries and assembling a wide range of electric vehicles. (China is expected to account for two-thirds of the world’s battery production as early as 2021.)

On a national scale, the French government appears to have established a goal of curbing the use of gasoline and diesel fuels for vehicles by 2040. India (by 2030), Norway (by 2025) and, most recently, Great Britain hope to achieve similar goals even earlier.

As a result, the electric vehicle market, which is just 3% of worldwide sales today is expected to triple to 9% by 2025. According to a 2017 updated financial analysis by Bloomberg New Energy Finance (BNEF), that is just the beginning. “EVs are on track to accelerate to 54% of new car sales by 2040.”
One might ask: “What is propelling the momentum toward electric vehicles? Is it solely the environmental benefits and the desire for cleaner air in our increasingly urbanized world?”

That would be nice; but the anticipated dominance of EVs may derive from far more pragmatic technological developments. Improvements in lithium ion battery life, charge density, recharge rates, efficiency and reductions in the costs of materials for production are decreasing electrical vehicle motive costs by about 8% per year. While batteries sold for $1,300 per kiloWatt hour (kWh) in 2007, costs decreased to $500 per kWh by 2012 and stand at about $200 per kWh in 2017.

If battery costs continue to decline, as anticipated, to $100 per kWh by - or before - 2030, electric vehicles would be cheaper both to build and operate than fossil-fueled vehicles. If battery costs actually drop as low as $73 per kWh in 2030, as forecast by BNEF, the choice for most buyers would be simpler still.

As matters stand in 2017, electrical energy for electric cars costs about 2 cents per mile. Battery depletion (amortization of replacement costs) adds another 12 cents per mile to vehicle operation cost. (It might also be worth noting that at least a few of the electrons used for charging my modest electric car’s batteries come from our roof-mounted solar panels.)

**Opposition to the Introduction of Electric Vehicles**

As many others, the State of Missouri does not appear to be poised to be a leader in the adoption of any transformative (disruptive) new automotive technology. Conservative legislative opposition has already arisen in terms of EV dealer sales restrictions. Substantive gas taxes have been levied in the guise of ‘annual decal fees for EVs’.

For example, Missouri’s ‘equivalent electric vehicle gas tax’ on my 2014 Nissan LEAF calculates as $1.24 per gallon not burned. All-Electric Vehicles - and Gasoline Taxes

Since auto dealers derive roughly three times as much profit on vehicle service as on sales, the fact that electric vehicles require virtually no maintenance constitutes a very substantial drawback. (Despite extensive nightly advertisements for the Nissan vehicle lineup, it is perhaps symptomatic that we have never seen its LEAF advertised on local television.)

Many families will find there are drawbacks to owning electric vehicles; range and recharging opportunities among them. However, for those with short (< 80 mile) commutes and homeowners with 120 volt electrical outlets, EV time is already here particularly since a $7,500 federal tax rebate is still available. This incentive reduces the purchase cost of a modest electric vehicle, such as a LEAF, to about $22,000.