IMPACT OF ELECTRIC MOBILITY ON OIL & GAS INDUSTRY

In the following piece, **Mr. Dipankar Ghosh, Partner** & **Dr. Remant K. Tiwari, Senior Consultant -Thinkthrough Consulting Private Ltd**. try to weigh in all the factors that indicate the huge potential for growth in the EV market and those that point towards its effect being less than anticipated on the oil and gas industry, thereby making a case for a rather uncertain future over the impact of the former on the latter in the longer haul.

THE CURRENT SCENARIO

Climate change and the rising awareness around it together with a favourable climate for tech innovation is challenging the status quo of several sectors. The advent of electric mobility in the transportation sector is a glaring example of the same. The environment-friendly Electric Vehicles (EVs) which can help in bringing down greenhouse gas (GHG) emissions in the longer run can prove to be a threat to the oil & gas Industry. Globally, the transportation sector is one of the major consumers of fossil fuel products. EVs are still at a nascent stage with a number of areas yet to be worked upon before they can be adotpted on a large-scale. It is, however, too early to conclude whether large scale production of EVs will impact the oil & gas industry as estimated.

India is expected to be one of the largest contributors to non-OECD petroleum consumption growth around the world. Oil imports rose sharply to US$ 87.37 billion in 2017-18 from US$ 70.72 billion in 2016-17 (IBEF). Both PSUs and the Private sector in the oil & gas industry have made significant contributions to the Indian economy. All activities along the petroleum sector value chain contribute to around 15% in India's GDP (Invest in India; Oil and Gas).

The push for EVs and Hybrid vehicles came at a time when the automobile industry was going through a transition - from BS-IV to BS-VI fuels. And, thus in early 2019, the government announced Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME-2) scheme with an outlay of INR 1,000 crore, under which it aims to promote electric mobility in India.

A prominent government thinktank Niti Aayog has suggested that 'electric' three-wheelers and two-wheelers below 150 cc should ply Indian roads by 2025 (Niti Aayog). The Federal think tank has further argued that a significant part of the country's enormous spends on oil imports (such as the colossal USD 112 billion - INR 7.83 lakh crore, spent on importing oil in 2018-19) can be brought down with a complete switch to EVs (Economic Times).

Currently, India does not have large scale battery manufacturing facilities or a cost-effective battery solution. It is also necessary to have adequate charging stations before EVs can be rolled out on a large scale. Presently, EVs constitute less than 2% of the total vehicles that are sold globally.

Dharmendra Pradhan, Minister for Petroleum and Gas has said, that even with an aggressive EV rollout plan, India would need 450 MMTPA (Million Metric Tonne Per Annum) of refining capacity by 2040, which is a little over an 80% increase from 248 MMPTA of capacity as recorded in 2018-19. (Horizon-2019 conference)

There is varied information available on the future of EV in the public domain. The government, it seems, is limited in its consensus over the subject. Through this article, we have tried to bring in some relevant insights via diverse viewpoints and factual data on EVs to help undertsand them better rather than draw a definite conclusion.

OIL CONSUMPTION IN INDIA

India's oil consumption has surged in the last 30 years. It has progressively increased at a Compound Annual Growth Rate (CAGR) of 5.17% from 50,166 ktoe in 1990 to 1,95,516 ktoe in 2017 (IEA, 2019). The primary factors responsible for this growth are rapid economic development and population boom. Currently, India consumes over 1,87,000 ktoe of oil.

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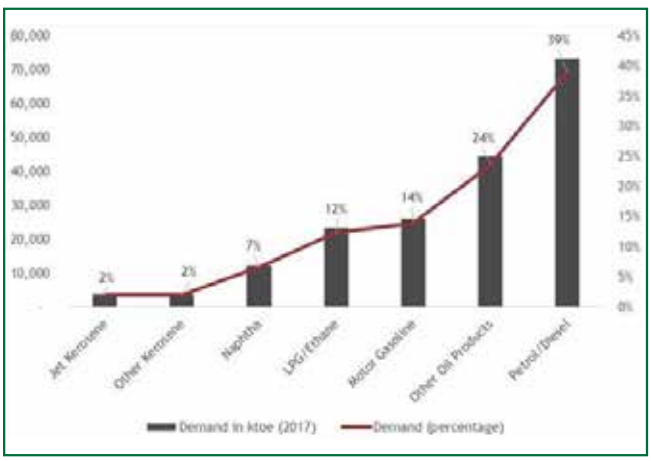
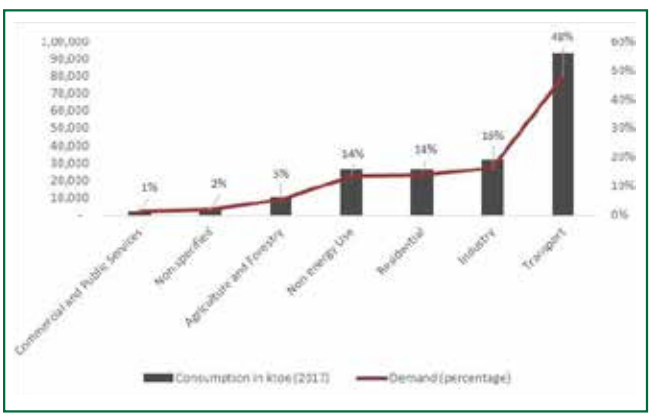
It represents 5% of the total global oil demand. This is expected to grow at a CAGR of 3.9% in the 2020s and is most likely to surpass China's oil demand by the mid-2020s [IEA, 2020]. The demand for gas and diesel constitutes 39% of the total oil demand, as has been depicted in the Figure below:



[Source of data: https://www.iea.org/subscribe-to-data-services/world-energy-balances-and-statistics]

The transport sector is the largest consumer of oil and gas products in India, constituting around 48% of the total oil demand. In the period from 1990 to 2017, oil demand from the transport sector grew at a CAGR of 6.26%. Please refer to the Figure below:



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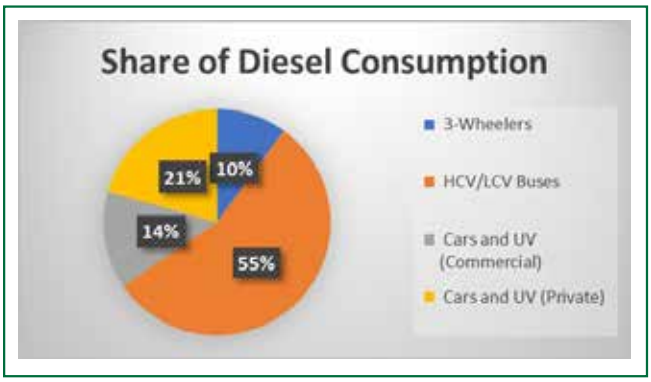
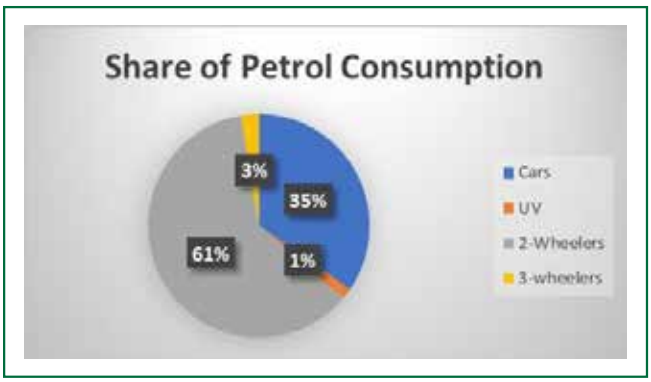


[Source: All India Study on Sectoral Demand of Diesel, 2014]



[Source: All India Study on Sectoral Demand of Diesel, 2014]

Overview of Electric Vehicle (EV) segment

The EV market segment comprises of two-wheelers, low-speed three-wheelers, high-speed three-wheelers, personal electric cars, commercial electric cars, and electric buses. Owing to the "Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India" (FAME India) Scheme, the EV market has seen a significant growth in the last 2-3 years. In FY 2019, a total of 7,59,000 units of EVs were sold in India. Of these, 83% were three-wheelers and 16.5% were two-wheelers [EV sales in India cross 750,000 units in FY2019 but FAME II may spoil the run, Auto News]. The EV market is expected to grow at a CAGR of 43.13% during 2019-2026 [India Electric Vehicle (EV) Ecosystem Market Share, Size, Analysis 2030 | BIS Research]. This growth will be driven by government subsidies, tax benefits, entry of domestic battery manufacturers, and price reduction due to economies of scale. It has been estimated that by 2030, electric two-wheelers will constitute around 29% of the active vehicle stocks while electric four-wheelers will constitute around 44% of the active vehicle stocks [Abhyankar et al., 2017].

Factors Responsible for EV Adoption

The penetration of EVs in the passenger vehicle segment will depend on the adoption rate which in turn will be determined by a variety of factors such as procurement cost, operational cost, maintenance cost, vehicle range, charging infrastructure, and enabling environment.

Currently, the prices of EVs are higher than that of conventional comparable gasoline-based vehicles. This is because of the

high cost of advanced Lithium-ion batteries. With improved access to innovations in technology, entry of domestic players, and economies of scale resulting from an increase in demand, the cost of batteries is expected to come down, which will eventually make EVs more affordable.

The operating cost of EVs in terms of cost of running per kilometre is lower than that of conventional gasoline-based vehicles. This is because of lower and stable prices of electricity compared to higher and volatile prices of gasoline and higher efficiency of electric engines compared to that of conventional engines. Moreover, government subsidies under FAME and lower GST rates are expected to provide for an enabling environment for adoption of EVs and expansion of the infrastructure network for charging. With significantly fewer moving parts, the maintenance cost of EV is expected to be lower. These factors when considered make the penetration

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of EVs in the passenger vehicle segment seem highly possible. If these estimations hold true, EVs will constitute around 30% of the total fleet by 2030.

Impact of EVs on Oil & Gas Industry

EV penetration will adversely impact the demand and the oil & gas industry overall. Impact on the demand for Oil and Gas will not only be determined by the number of conventional gasoline-based vehicles displaced by EVs but also by the average usage. Two-wheelers, three-wheelers, and small cars are generally used for short-distance travel, while UVs and buses are used for long-distance travel. EVs will have better acceptability and adapdability for small distance travel due to constraints of charging time and battery capacity. So, by and large, growth in the EV segment will be driven by two-wheelers, three-wheelers, light motor vehicles, and city buses. Thus, the shift towards EVs may not have as huge an impact on the oil & gas demand. Moreover, the absolute demand for oil and gas may increase due to other cross-cutting factors, some of which are mentioned below.

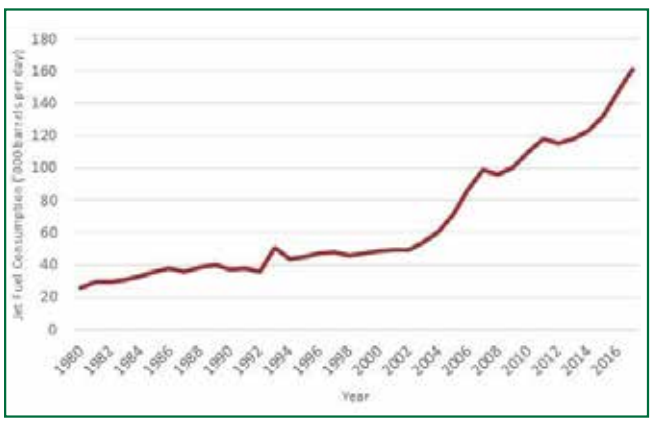
Vehicle Population

India has a passenger vehicle density of 26 per 1,000 people. It is substantially low as compared to the OECD average of 442 vehicles per 1,000 persons and the ASEAN average of 56 vehicles per 1,000 people [IEA, 2020]. The growth of the automobile market also depends on road infrastructure where India may be lagging compared to the developed world. With rising population and economic progress, the passenger vehicle density is expected to increase in the near future. It is estimated that the total number of passenger vehicles will

shoot up by 75% during 2020-2030. This expansion of the passenger vehicle fleet will lead to an increase in the demand for oil and gas.

Growth in civil aviation

Rapid economic growth creates a movement in the economy that results in a higher disposable income. With a prospering and burgeoning middle class, the Civil Aviation Industry in India is poised to take off at a high speed. Significant Government and Private Investments in this sector are predicted to boost its growth further. India is expected to become the third-largest civil aviation market by 2024. With an increase in air traffic, the consumption of jet fuel is expected to soar. According to Fortune [Fortune Business Insight, July 2019], the Aviation fuel market is expected to grow at a CAGR of 5.22% between 2015-26, and the trend in India is expected to be similar, if not higher. The following Figure shows the rapid growth of jet fuel consumption in India, and also the exponential growth over the course of the last two decades



[Source of data: https://www.theglobaleconomy.com/India/jet_fuel_consumption/]

Electricity demand

India's electricity demand is increasing steadily and is expected to go up further during the 2020s. India had a total installed capacity of 365 GW in 2019. While natural gas contributes to 4.6%, oil contributes to 1.6% of the total electricity generated. The per capita electricity consumption in India is substantially lower than that of developed economies. With government's focus on electrification and provisioning of the per capita uninterrupted supply of electricity, [electricity] consumption is expected to go up. Though a large portion of increased demand is expected to be fulfilled by renewable sources, oil and gas shall continue to contribute to the energy mix. Additionally, compared to renewable sources, natural gas is more likely to replace coal for thermal power generation for ensuring grid stability. Renewable sources are more appropriate for peak load, while conventional fuels are more suitable for maintaining the baseload. Improvement in storage technologies may make renewables more suitable for maintaining baseload - it is however still in the initial stages

of development and adoption. Thus, with reference to the aforementioned statements, increased for electricity demand is likely to have a positive impact on gas demand.

Pointers for follow-up thoughts

While it is clear that Electric Vehicles are here to stay and grow through the 2020s and 30s, there is not much clarity

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as to their impact on the oil & gas sector. No matter how environment-friendly it may be, en-mass rolling out of EVs canot happen overnight as they require massive investments in infrastructure. This includes the availability of advanced and cheaper battery technology, setting up facilities for battery production and charging facilities.

Yet, there are more and more discussions within top oil & gas companies around allocation of funds for adding new retail fuel outlets in cities or directing them towards addition of EV charging stations at the existing outlets.

While there is a steady consumer interest in hybrid vehicles (fossil fuel + battery combination) at the moment, the future of this sector/segment is hazy. The response to the auto sector for catering to this demand will also be a key factor in influencing the auto fuel demand.

At the same time, an unrestricted business environment together with an emboldened middle class is expected to boost the air traffic by manifold. It has thus been predicted that Jet fuel consumption will rise with the expansion of the civil aviation sector.

The oil & gas sector is therefore on a rise buoyed by demand from passenger vehicles, civil aviation, and electricity, all of which seem to be able to negate the affect of rise in demand of EVs.

The Indian oil & gas industry involves the use of diverse products thereby increasing the need to invest substantially for altering the product mix. While the demand for auto-fuel, aviation fuel, and gas (for power generation) may change in the the future, it will take some time for the impact to be assessed.

Both the energy and transportation sectors are currently undergoing a rapid transformation. Electric mobility and the oil & gas sector are chartering their own growth paths through different routes to address sustainability and the threat of climate change. Facts tend to suggest that there may not be a major conflict between the two sectors in the near future, but the long-term scenario could prove to be different. We certainly need to wait and watch for that to unfold!