Electric vehicles in India – The Resource Efficient Way

Date: 15th February, 2018

Time: 1.30 pm -3.30 pm

Venue: Juniper, India Habitat Centre, Lodhi Road, New Delhi

India's ambition towards a full electric mobility economy by 2030 was announced last year. Although, India is yet to launch a comprehensive policy that chalks out clear policy directions, there have been initiatives in the past through the launch of National Electric Mobility Mission Plan (NEMMP), 2013 and Faster Adoption and Manufacturing of Hybrid & Electric Vehicles (FAME), 2015. Under the NEMMP, around 6–7 million EVs/hybrid vehicles has been envisioned to be launched on Indian roads by the year 2020, while under FAME, the government has targeted to offer subsidy on EV on an annual basis.

The scheme has been successful in increasing the share of hybrid and electric passenger vehicles sales from almost zero percent in 2012 to 1.3 percent by 2016. In order to accelerate penetration of these vehicles in the market, the government had earlier declared certain measures that included placement of battery-based electric vehicle (BEVs) in a low GST slab of 12 percent, as compared to 28 percent for petrol and diesel cars and hybrid vehicles. In order to create a market for electric vehicles, the government decided to replace petrol and diesel cars currently used by the Central government and its agencies. In 2017, the Energy Efficiency Services Limited (EESL) also floated a tender for procuring 10,000 BEVs and the contract was awarded to Tata Motors. EESL is expected to float another tender for procuring 10,000 EVs in early 2018. In order to promote production of electric buses, the government has already declared incentives of 60 percent of the cost of the electric bus or Rs. 85 lakhs whichever is lower, that contain at least 15 percent of the components that have been produced in India.

It is important to recognize that despite many economic and environmental benefits of E-vehicles and hybrid vehicles, there may be challenges with regard to resource availability and affordability. Preliminary estimates reveal that a 100 percent penetration of BEV (only four wheelers) by 2030 would increase material demand by 85 times. Many of these resources like copper, lithium and related materials and components, plastics and magnets are heavily imported by India.

Globally 42 percent of cobalt is used in making batteries and by 2020 and the share is expected to rise to 55 percent. Research reveals that cobalt Industry has a fragile supply structures among all battery raw materials. Moreover with India being highly import dependent for these resources, their procurement will have significant impact on the exchequer.

Permanent magnets that use a lot of rare earths, have attracted research interest on reducing rare earth content in electric traction motors using two main approaches: (i) increasing material efficiency in magnet production (e.g. grain boundary diffusion processes), thereby obtaining NdFeB magnets with less rare earth content but with similar performance; and (ii) optimising the motor design, enabling high technical performance while using fewer NdFeB magnets. This research indicates a possible reduction in the amount of neodymium and praseodymium in permanent magnets by up to 29 from 2015 to 2030. However, substitution would only be able to partially mitigate a potential shortage in the supply of rare earths in EV applications. This calls for a policy for the integrated security of supply for rare earths that also considers substitution alongside secure access and recycling as potential solutions. Charging infrastructure is also crucial for successful deployment of EVs and an effective umbrella policy is the need of the hour that would overcome the regulatory issues, economic barriers as well as promote technology innovations.

It is important to recognize though that despite many economic and environmental benefits of E-vehicles and hybrid vehicles, there are new resource efficiency related challenges that are emerging. These include

- Availability and affordable supply of certain materials particularly rare earths which India is heavily dependent on imports and they having competing applications
- Effects of the planned development of electro mobility will have on the supply situation and future price trends of the raw materials needed
- Ways to reduce the resource requirements of specific metals for particular components or which alternative technologies could ease the demand for raw materials? Here also need to look into uncertain disruptive changes regarding design and material compositions
- Charging stations that have a strong network and decentralized presence. Also need to have technologies and systems to generate energy from sustainable sources
- Development of recycling strategies and technologies for the recycling of power electronics from EOL electric vehicles
- Fragmented and unscientific end of life vehicle management in India; not much recovery of rare earths happening from non-electric vehicles; Existing resource recovery from batteries has been confined to cobalt, nickel, and copper due to their high value

- Limited understanding of environmental threats from unscientific battery, power electronics and motor recycling
- With increasing networks being established with Chinese battery manufacturers and exporters, there is import of lithium ion batteries happening at very low prices which may eventually replace the conventional lead acid batteries even in three wheelers and the lack of policy framework and improper dismantling can prove costly from the environment and resource recovery point

This workshop aims to provide a platform to discuss these challenges. The structure of the workshop will focus around two sessions:

- Resource efficiency implications for the Electric/Hybrid Vehicles sector
- Legislative and policy framework reforms required to enhance resource efficiency in the sector

With this background The Energy and Resources Institute (TERI) is organizing a workshop on 'Electric vehicles in India – The Resource Efficient Way'', on 15th February, 2018, at India Habitat Centre, New Delhi as a part of TERI's ongoing project titled, 'Resource Efficiency Initiative in India, supported by the European Union. The workshop will invite representatives from Vehicle OEMs, Auto component manufacturers, Charge Network Technology Providers, Government and industry experts.