

## AIR Discussions (November 4<sup>th</sup> Week)

### **AIR SPOTLIGHT: ELECTRIC MOBILITY IN INDIA - A STEP TOWARDS CLEAN ENERGY**

**CONTEXT:** In India, the government in 2017 set an ambitious target of 100% electric cars by 2030. India is the **fifth largest car market in the world and has the potential to become one of the top three in the near future — with about 40 crore customers in need of mobility solutions by the year 2030.**

#### **WHAT ARE ELECTRIC VEHICLES (EVs)?**

- An electric vehicle uses one or more electric motors or traction motors for propulsion.
- An electric vehicle may be powered through self-contained battery, solar panels or an electric generator to convert fuel to electricity.

#### **CURRENT STATUS OF EVs IN INDIA:**

- In India, there's a mixed performance by the auto sector when it comes to electric mobility.
- While electric two-wheelers and three-wheelers have found a fair level of traction, other vehicle segments are far behind.
- The Indian electric vehicle (EV) market saw a **20 percent growth in 2019-20 with sales of 156,000 units, of which 152,000 or 97 percent of total volume were two-wheelers.**
- Charging infrastructure has also kept pace with almost 30 lakh chargers at homes and workplaces and about 430,151 publicly accessible chargers worldwide in 2017.
- Indian **market share of electric cars is a meagre 0.06 per cent.** According to the Society of Manufacturers of Electric Vehicles (SMEV), Uttar Pradesh topped the list of the states with highest EV sales, followed by Haryana.

#### **DATA ON ELECTRIC VEHICLE:**

- It is estimated that **two in every hundred cars sold today are powered by electricity.**
- This phenomenon is today defined by the rapid growth in EV uptake, with EV sales for the year 2020, reaching 2.1 million.
- The **global EV fleet totalled 8.0 million in 2020 with EVs accounting for 1 per cent of the global vehicle stock and 2.6 per cent of global car sales.**
- Falling battery costs and rising performance efficiencies are fuelling the demand for EVs globally.

### GOVERNMENT INITIATIVES:

- **National Electric Mobility Mission Plan 2020 (NEMMP)** was conceived in 2013 with an objective to achieve sales of 60-70 lakh units of total EVs by 2020.
- In 2015, the **Faster Adoption and Manufacturing of Electric vehicles (FAME) scheme** was launched to fast-track the goals of NEMMP with an outlay of Rs. 795 crores. The initial outlay was for a period of 2 years, commencing from 1 April 2015, which was extended up to 31 March, 2019.
- **FAME India Phase II** has been launched, with effect from 1 April 2019, with a total outlay of Rs. 10,000 Crore over the period of three years. Emphasis in this phase is on electrification of public transportation.
- In addition to the initiatives of the Government of India, **several states, including Karnataka, Kerala, Telangana, Maharashtra and Andhra Pradesh, Uttar Pradesh, Uttarakhand, have drafted EV policies** to complement the national policy and address state-specific needs.
- **National Mission on Transformative Mobility and Battery Storage** was launched to promote clean, connected, shared, sustainable and holistic mobility initiatives. The Mission will drive mobility solutions that will bring in significant benefits to the industry, economy and country.
- **Phased Manufacturing Programme:** Valid for 5 years till 2024 to support setting up of a few large-scale, export-competitive integrated batteries and cell-manufacturing Giga plants in India.

### IMPACT OF EVs:

- **ECONOMIC GROWTH:**
  - Shifting modes of mobility could launch new business opportunities.
  - There are several studies that suggest overall positive impact on GDP on introduction of EVs in fuel importing service dominated economies.
- **EMPLOYMENT:**
  - European Climate Foundation has estimated that through reducing oil demand by more efficient electric cars, employment will increase by 5,00,000 to 8,50,000 by 2030.
  - As far as the automotive sector is concerned, a large part of the supply chain will get transformed in the power train segment.
  - Another report estimates that about 2 million additional jobs will be created by EVs by 2050.
- **ENVIRONMENT AND HEALTH:**
  - ICEs are one of the main sources of air pollution globally. They negatively affect both human health and ecology. Emissions from ICE powered motor vehicles are responsible for about two-thirds of air pollution in urban areas.
  - The current ban on older fuel cars in some Indian cities already shows a positive influence on air quality, and this can only further improve with the large scale introduction of EVs.
  - According to NITI Aayog (2019), if India reaches an EV sales penetration of 30 per cent for private cars, 70 per cent for commercial cars, 40 per cent for buses, and 80 per cent for 2 and 3 wheelers by 2030, a saving of 846 million tons of net CO<sub>2</sub> emissions and oil savings of 474 MTOE can be achieved.
- **LAST-MILE CONNECTIVITY AND RURAL TRANSPORT:**
  - Freight movement in the rural areas, and for transport connecting farms to cities, are primarily handled by smaller transport vehicles.
  - These vehicles are eminently suited for replacement by EVs.
  - Sustainable mobility would require that small freight vehicles are enabled by aggregators to be made available on request, just as Uber or Ola cabs for city commuters.
  - This would cut farm to market costs for the farmers, and also result in better fleet utilisation.

- **REDUCING OIL IMPORTS:**
  - India has over 170 million two-wheelers.
  - If we assume that each of these vehicles uses a little more than half a liter of petrol per day or about 200 liters per year, the total amount of petrol used by such vehicles is about 34 billion liters. At ₹70 per liter, this would cost about ₹2.4 lakh crores.
  - Even if we assume that 50% of this is the cost of imported crude (as tax and other may be 50%), one may save ₹1.2 lakh crores worth of imported oil.
- **INNOVATION:**
  - It will encourage cutting edge technology in India through adoption, adaptation, and research and development.
- **URBANIZATION:**
  - India is home to 14 out of 20 most polluted cities in the world. EVs will help in tackling this problem by reducing local concentrations of pollutants in cities.

### CHALLENGES FOR EV IN INDIA:

- **POLICY INSTABILITY:** EV production is capital intensive sector requiring long term planning to break even and profit realization, uncertainty in government policies related to EV production discourages investment in the industry.
- **TECHNOLOGICAL:** India is technologically deficient in the production of electronics that form the backbone of EV industry, such as batteries, semiconductors, controllers, etc.
- **LACK OF ASSOCIATED INFRASTRUCTURAL SUPPORT:** The lack of clarity over AC versus DC charging stations, grid stability and range anxiety (fear that battery will soon run out of power) are other factors that hinder the growth of EV industry.
- **LACK OF AVAILABILITY OF MATERIALS FOR DOMESTIC PRODUCTION:** Battery is single most important component of EVs. India is dependent on countries like Japan and China for the import of lithium-ion batteries.
- **LACK OF SKILLED WORKERS:** EVs have higher servicing costs and higher levels of skills is needed for servicing. India lacks dedicated training courses for such skill development.

### WAY FORWARD:

- **ECONOMIC:**
  - The NITI Aayog has recommended bringing financing of electric vehicles under priority sector lending.
  - Streamlining of the goods and services tax (GST) and import duties for battery, cell and components.
  - India needs a new approach to import duty while keeping “Make in India” as a goal.
- **POLICY:**
  - The general strategy should address two key variables affecting the costs of EVs: battery costs and any fiscal policies that either increase the costs of an ICE vehicle or decrease the costs of an EV.
- **R&D:**
  - India should develop strong R&D capacity leading to commercialization in EV subsystems.
  - There is a need for better industry-academia collaboration.
  - Development of appropriate battery technologies that can function efficiently in the high temperature conditions in India need to be given utmost importance.
- **INDUSTRY:**
  - India would need a new power-electronics industry which can help develop and produce high-efficiency subsystems for EV industries. A special thrust is needed to promote such industries.

- **INFRASTRUCTURE:**

- Adequate charging stations should be made available throughout the road networks.
- Universal charging standards for the country as a whole to enable increased investment in creation of such infrastructure.
- The limiting factor of batteries on driving range may be addressed by developing an ecosystem of fast-charging or swapping of batteries.

- **PUBLIC TRANSPORT:**

- India's per capita car ownership is just 20 vehicles per 1000 people. In USA, it's 900 per 1,000. In Europe, it's 800 per 1,000. And therefore, when we move from 20 to 900 or 800, there's an opportunity to leapfrog ahead of the legacy model.

<https://indianexpress.com/article/opinion/columns/indias-greener-future-electric-vehicle-evs-zero-carbon-emission-7649708/>

<https://www.niti.gov.in/how-india-can-plug-electric-vehicle-charging-infra-holes>

<https://www.thehindu.com/business/Industry/transition-of-automobiles-towards-electric-mobility-inevitable-niti-aayog-ceo/article36094093.ece>

<https://www.niti.gov.in/sites/default/files/2021-08/HandbookforEVChargingInfrastructureImplementation081221.pdf>

[https://www.researchgate.net/publication/353260957\\_Electric\\_Vehicles\\_in\\_India\\_A\\_Literature\\_Review](https://www.researchgate.net/publication/353260957_Electric_Vehicles_in_India_A_Literature_Review)

<https://www.teriin.org/sites/default/files/2019-11/Faster%20adoption%20of%20electric%20vehicles%20in%20India.pdf>

## **NEWS IN BRIEF: PRELIMS SPECIAL**

### **ACROSS**

- The **Atmosphere and Climate Research Modelling Observing Systems and Services (ACROSS) scheme has been extended by the cabinet till the period of next Finance Commission cycle.**
- There are eight sub-schemes under “ACROSS” scheme and they are implemented through the operating units: IMD, IITM (Institute of Tropical Meteorology), NCMRWF (National Centre for Medium Range Weather Forecasting), INCOIS (Indian National Centre for Ocean Information Services).
- This scheme offers highly advanced Monitoring, Detection and Early Warning of calamities like tropical cyclones, thunderstorms, dust storms, heavy rain, snow fall, cold and heat waves.

### **O – SMART Scheme**

- The **continuation of the Ocean Services, Modelling, Application, Resources and Technology has been approved by the cabinet.** This scheme operates under the Ministry of Earth Sciences.
- **Schemes under O-SMART**
  - Ocean Technology, Ocean Modelling and Advisory Services (OMAS)
  - Ocean Observation Network
  - Ocean Non-living Resources
  - Marine living resources and ecology
  - Coastal research
  - Operation and Maintenance of Research Vessels
- The O-SMART scheme has enabled the expansion of ocean activities of India from the Arctic to the Antarctic region accompanied by satellite based monitoring systems and observations.

### **Lachit Diwas**

- The Prime Minister paid tribute to the bravery of Lachit Borphukan on the occasion of Lachit Diwas.
- **Lachit Borphukan was a military commander in the Ahom kingdom and he is known for his immense contribution in leading the Battle of Saraighat in 1671 defeating the Mughals.**
- He was given the title Borphukan which means one of the five councillors in the Ahom kingdom having both executive and judicial powers.
- He is regarded as the protector of Assamese culture and tradition for his remarkable contributions towards preserving the unique culture.

<https://newsonair.gov.in/News?title=PM-pays-tributes-to-Lachit-Borphukanon-on-Lachit-Diwas-today&id=430215>

### **Bharat Gaurav Scheme**

- The Ministry of Railways **introduced theme-based tourist circuit trains to showcase the rich culture and history of India.**
- The service providers will be given complete freedom to choose any historic theme. For example, Guru Kripa trains will surround the areas important to the Sikh culture, Ramayana trains will connect places related to Lord Shri Ram.
- These trains can be run by both private and state-owned operators.

<https://newsonair.gov.in/News?title=%26%2339%3BBharat-Gaurav%26%2339%3B-train-can-be-run-by-private-sectors%2C-IRCTC%3A-Railway-minister-Ashwini&id=430157>

### The Fourth Submarine of Project – 75

- **'INS Vela', the fourth submarine of Project – 75 was commissioned at the naval dockyard of Mumbai.**
- These are scorpene class submarines built in India by Mazagon Dock Shipbuilders Limited, Mumbai in collaboration with the Naval Group, France.
- The scorpene class submarines are designed with stealth features and possess long range torpedoes as well as anti-ship missiles.
- They have state of the art SONAR (Sound Navigation and Ranging) and sensor suites that allow effective operation capabilities along with Permanent Magnetic Synchronous motor and propulsion motor.
- **The name Vela is derived from the old submarine Vela of Soviet origin which served the Indian Navy from 1973 to 2010 and was decommissioned thereafter. It was a Foxtrot class submarine.**

<https://newsonair.gov.in/News?title=Indian-Navy-to-commission-indigenously-built-Scorpene-class-submarine-INS-Vela-in-Mumbai&id=430256>

### National Milk Day

- **To pay tribute to Dr. Varghese Kurian on his birth anniversary, every year the 26th day of November is celebrated as National Milk Day. This year marks the centenary year of the birth of the Milk Man of India, Dr. Kurian.**
- Dr. Kurian is regarded as the Father of the White Revolution in India.
- Operation Flood, under the vision of Dr. Kurian, was the biggest dairy development program in the world that resulted in enhanced milk production in India.
- He laid the foundation of 30 institutions run by farmers and workers and played a pivotal role in the success of Amul Brand

<https://newsonair.com/2021/11/26/nation-observes-national-milk-day-on-26th-nov-centre-distributes-national-gopal-ratna-awards-in-ceremony-at-nddb-campus-in-anand/>